

THE KEYSTONE PROFESSIONAL

Spring 2011

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Student Networking Dinner

**Attract, Engage, and Develop
the Next Generation**

JUMP TO THE PUMP

**AN ARTICLE ON THE JAMES AVENUE PUMPING
STATION – 1908 TO 1986**

Association of Professional Engineers and
Geoscientists of the Province of Manitoba
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THE KEYSTONE PROFESSIONAL

SPRING 2011

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FEATURES

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Our president's
new photo is
coming soon!

Bill Girling, P.Eng.
President's
Message

Putting a Positive Spin on CPD

First off, I'd like to extend a belated Happy New Year to all APEGM members since I managed to miss the President's message in the winter 2010-11 edition of the Keystone. I am looking forward to serving the Association in what I am sure will be an interesting and exciting year for engineers and geoscientists in our province.

One of Council's key challenges this year will be rolling out APEGM's Continuing Professional Development (CPD) program. Grant Koropatnick and I will both be writing about this throughout the year to ensure that members are well informed and more importantly reassured that the transition to online reporting will be done as efficiently and seamlessly as possible.

APEGM's decision to move forward on the requirement to report professional development was primarily driven by recent changes in our profession. At the 2010 Annual General Meeting, keynote speaker Jim Casey pointed out that major shifts in our profession have lead to a greater focus on formal CPD programs across the country; some of these paradigm shifts include the rate of change of technology in our profession, a shift towards a more proactive role for regulators and the realization that the traditional approach of using disciplinary systems to address competency was inefficient.

Engineers Canada, the national organization of the 12 provincial and territorial associations that regulates the profession of engineering in Canada recently developed a national guideline on continued competence. As Council became familiar with the national

program it became apparent that Manitoba was one of the few remaining provinces that did not have a requirement for reporting of CPD. As has been pointed out in previous articles, APEGM members have always been obligated to maintain professional development, but, to date, have not been required to report.

With that, Council's focus over the past year was to develop an easy to use online reporting system for members to use to facilitate the annual reporting of CPD activities in the six categories described in the guideline; with an emphasis on making this as simple as possible. We have APEGM's brilliant IT specialist Andrew Reddoch to thank for this and we have already received numerous commendations from other associations on how simple and easy our online system is. As this is the voluntary year for CPD reporting, we encourage members to offer suggestions on how we can continue to improve the reporting system even more, but we need more members to use the system to help us achieve this. Remember that January of 2012 is the start of the first three-year period for CPD; so members do not have to meet their CPD hours by that date; CPD starts from there forward.

John Woods (Past President) and I plan to do a number of presentations throughout the year to help members understand the CPD program, address their concerns and provide examples of how easy the online reporting system is to use.

Finally, I'll put in a pitch to login to your APEGM website (<http://www.apegm.mb.ca>) extensively and become familiar with the features of the new and

improved website. For those of you who have never logged in, your Login ID is your membership number (Tip - it's the number on your membership card which you should have just received) but you will need to create a password.

Let's all make this a great year for our association.

Any correspondence for the current President can be sent to president@apegm.mb.ca. ■

In Memoriam

The Association has received, with deep regret, notification of the death of the following members:

*Bruce Philip Menlove
Paul Emile Albert Lagasse
Larry Ernest Hurwitz
James Finley Scaife
Daniel Oleksiuk*

Engineering Philosophy 101

...speculations on intended meaning

M.G. (Ron) Britton, PEng.

I recently listened to a series of recorded lectures from a course entitled *The World Was Never the Same*. It was prepared and delivered by Dr. J. Rufus Fears, a Philosophy Professor at the University of Oklahoma. In his course he spent a couple of hours exploring what he called the Axial Age, from 563 BC to 399 BC. He discussed the teachings of Buddha, Confucius, Socrates and the renewal of Judaism. He identified these four schools of thought as the most important moral influences during that period, and possibly beyond. Further, he noted that they all espoused the same four fundamental moral principles: wisdom, justice, courage and moderation.

Fears provided definitions of these principles based on available historic records.

Wisdom - how you apply information and knowledge.

Justice - benevolence, treating others properly, with respect, being fair and keeping your word.

Courage - doing what is right, towards others but also for yourself.

Moderation - what is appropriate in a particular situation, for yourself and others.

Fears went on to contend that these moral principles, and the standards of behaviour they imply, provide the ethical basis upon which most modern religions are founded.

So what does that have to do with Engineering Philosophy? It is a bit of a twisted path.

In Canada, professional practice comes under the jurisdiction of Provincial or Territorial legislation. Typically this jurisdiction is exercised by passing Acts that create "Associations" for specific professions. Details of these Acts vary by profession and jurisdiction, but in general they grant the right to, and responsibility for, professional self government.

A common element in virtually all of these professional Acts is the requirement to develop and enforce a Code of Ethics. Here in Manitoba, our Engineering and Geoscientific Professions Act specifically requires "... a code of ethics containing standards of conduct pertaining to the practice of...

designed for the protection of the public." Further it requires that all members "...subscribe to and shall follow this code of ethics..." This provides us with a responsibility and a purpose, but not much clarity.

Specifics of our Code are important to each of us as we carry out our day-to-day responsibilities, but have you ever stopped to wonder why the government imposed a Code of Ethics on the profession? Was it intended as a Code of Ethics, a Code of Conduct or a Code of Practice? As I understand it, codes of ethics should reflect primary values and ethical standards. Codes of conduct, on the other hand, relate to lists of

expectations, standards or policies and codes of practice define professional responsibility. So, it would seem that the former is more personal and the later two, are more prescriptive. Was the intent to require a moral standard or was the use of the term "ethics" simply a reflection of society when the original Acts were proposed? It does cause one to ponder.

Fast forward to the APEGM Code of Ethics. If one was to consider specific requirements listed in the Fundamental Canons, our Code states that we must "...obey the laws...", consider "...the physical, economic and environmental well-being of the public...", employ "...reasonably attainable skill and knowledge...", uphold and enhance "...honour, integrity and dignity...", and "...be fair to colleagues..." The match of our Code's requirements with the Axial Age principles of wisdom, justice, courage and moderation, seems to lean more toward the moral than the prescriptive. And moral standards typically relate to religions, not professions.

Notwithstanding the moral versus prescriptive debate, the requirement for some sort of code is clear. We, like other professions, have been given a privilege that is not shared by all citizens. We can govern our profession and regulate the actions of those who belong. Government, and the citizens it represents, have a right to expect us to work to some defined standard. The behaviour of those who enjoy the privilege of self regulation needs to be clearly articulated. That is, I believe, the reason for the required Code of Ethics and the requirement for each of us to subscribe to that Code.

But in the spirit of inquiry that caused

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Grant Koropatnick, P.Eng.
Executive
Director's Message

Does your Life Have a Path?



By the time you're reading this, it will almost be springtime in Manitoba, but these thoughts came to me in the second week of January as I was musing on the new year. So humour me and come along for a minute... way back to the cold days of January. One morning while reading *The Globe & Mail* at my local Starbucks a convicting thought popped into my head: "Does your life have a path?" I was thinking of my own life and trying to reconcile the absence of any New Year's resolutions with the purposeful person I claim to be. I began to think of the APEGM membership; wondering how many members were thinking the same thing at this season of new beginnings, less calories and more fitness.

It's a bit of a daunting question: Does your life have a path? Well, don't be scared by the question; it's not so bad. I think everyone has a path. What does it include? Birth, upbringing, school years, formal education, career... wins and losses, gains and set-backs, senior years and death. Are you moving forward or are you side-lined? Can you see a picture of what you should do next? Is it clear or undefined? Is the journey just starting, half over or near the end?

I listened to the story of a member recently – it was shocking. He was participating in some activities that were both unproductive and harmful to himself. It surprised me at how indifferent

he had become toward the whole matter. I expect that this professional will crash and burn before long. I wish I could help him, but I can't. The path his life is taking is sad. Don't let that happen to you!

No matter what your present circumstances are, you can stop, re-assess, choose a plan of action or a different path and then take measured steps toward a new goal. It's good to check your plan with a mentor or peer advisor. This way we can avoid fooling ourselves about things which we may have accepted as normal when we should have rejected them as abnormal.

In 2011, all members have the opportunity to "stop, re-assess and choose a plan of action" with respect to their continuing professional development. The APEGM Council has been tracking national trends in continuing competency and formed a CPD Task Group to guide the membership on a new Continuing Professional Development program. There is growing public expectation that professionals prove their competency. Look at the recent media stories citing members disciplined by the College of Physicians & Surgeons and The Law Society. In both examples, the strong public statement was, "What is the regulator doing to protect us?" Consequently, in order to have a ready response for the public, APEGM is asking its members to report their CPD activities. As Registrar, I must

be able to show the public of Manitoba that the professional engineers and geoscientists are actively participating in continuing professional development. Without a reporting system, our answer to their question is inadequate: "Oh, we don't need to show you what we're doing... you should just trust us."

The task group of volunteers, with system analyst Andrew Reddoch, has developed and launched a new online system for saving PD activities to your personal profile on the APEGM web site. The utility, accessed through APEGM's secure portal is available to all members. Start by logging in to the members area and begin reading the CPD guideline. I'm sure you'll find the system easy and fun.

Does your life have a path? That's a lofty question. I'm sure your life has a path. As an APEGM member, I invite you to join me on the CPD path in 2011 by trying the new online system today.

Your feedback is invited and always welcomed. If you have any thoughts on anything you read in the KP, please email me at gkoropatnick@apegm.mb.ca or message me through Facebook. ■

FIVE PERSONAL TRAPS THAT CAN SABOTAGE YOUR CAREER

Shawn Bakker

Mel Sandler and Muriel Gray have written a book called “Winning at Work” that outlines five personal traps that can sabotage a career:

1. The “Taking it Personally” Trap. There is often a high price to pay in stress and emotional pain for people who take what happens at work too personally. Personalizing what happens around us can lead to regrettable thoughts, actions, or inactions, which further decrease our effectiveness at work. To depersonalize our thinking, we need to focus on the logical reasons for why certain

things have happened. Quite often, the decisions made at work are not motivated by personal feelings, but by the interests of the business.

2. The “Forgetting Self-Interest” Trap. We often forget to focus on our self-interest and the things that are best for us. In a quickly changing world, this can have disastrous results. To avoid ignoring our self-interest we need to set personal goals and look strategically at our career. As companies adjust in order to look out for their interests, we need to do the same.

3. The “Tunnel Vision” Trap. When we fall into the tunnel vision trap we miss both opportunities and pitfalls, especially in the dynamic world of work. To help see things differently we need to pay attention to dissenting opinions and challenge our automatic thoughts that served us well in the past. Just because things have worked before, we cannot count on them working forever.

4. The “Loyalty” Trap. At work we can fall into traps if we have too much or too little loyalty. Too much loyalty prevents us from cutting our losses, moving on, and separating our identity from a company. Too little loyalty prevents us from cultivating a purpose at work and getting the payoffs of growth opportunities within a company. Therefore, to be successful, people need to direct their loyalty in several directions at once, rather than aiming too much or too little loyalty to their work.

5. The “We’re Just One Big Family” Trap. It is easy to develop the same expectations for our work relationships that we have for our relationships at home. However, bringing family dynamics into work can get in the way of effectiveness. A manager is a manager, not a parent, co-workers are not siblings, and the people we manage are not children. Treating our work relationships too personally often gets in the way of taking responsibility for both our self and our work, maintaining our perspective, and staying clear about our work role. ■





M.G. (Ron) Britton, P.Eng.
Thoughts On
Design

. . . and the Process that Saved 33 Miners.

On Oct. 13, 2010, CTV reporter Lisa LaFlamme was “filling air time” as viewers waited for the last of 33 miners to reach safety from the depths of the collapsed San Jose Mine in Chile. Almost casually she stated that the rescue was a tribute to “engineering ingenuity.” In my opinion, she “got it right.”

The Aug. 5 news headlines announced that a cave-in had occurred at the San Jose mine. Thirty-three miners were trapped, their whereabouts and condition unknown. Three days later, Andre Sougarret, a Chilean mining engineer, was assigned the task of mounting a rescue/recovery operation. His successful completion of that task was truly a feel good, human interest story. It was also a classic application of the “Engineering Method” that Billy Koen defined some 25 years ago. Sougarret clearly developed, and delivered, a “...strategy for causing the best change in a poorly understood or uncertain situation within available resources.”

When Sougarret arrived at the mine, he found mass confusion and had virtually nothing to work with. His first task was to bring some order to the site and begin to improve his understanding of physical constraints he had to deal with. He began to add to the resources he had available by obtaining maps of the mine and adding Rene Aguilar, a “risk manager” to his team. After an on-site examination of the blockage in the mine shaft they decided that it would not be possible to drill through the “new” material, so a different approach was needed.

Priority One was to find the miners. With the help of miners who had escaped the

collapse, they identified a “workshop” area that seemed to be the most probable “safe haven.” Drilling began at a number of locations and 17 days later, contact was established. This meant the situation had changed. This was now a rescue mission, but the health, both physical and mental, of the miners needed to be attended to while a plan could be developed. The human “resources” had to be expanded.

Now that the target was identified, additional holes were drilled to provide refrigerated, oxygen enriched air, food and communications. While that was happening a powerful drill capable of creating a rescue channel was put into operation, Plan A. In order to improve the odds, a second drill rig that was capable of increasing the diameter of one of the existing holes was put in place, Plan B.

Given that rescue now seemed probable, if difficult, Sougarret sought input from NASA to begin the design of the rescue capsule. This expansion of the human “resource” provided both technical and additional medical advice regarding both the physical unit and the risks associated with its operation.

When problems developed with Plan B, an old oil derrick capable of digging a hole large enough to accommodate the rescue capsule was put in place, Plan C. Again the purpose was to minimize the risk of relying on any one drilling technology.

Forty- four days into the project, the Plan B drill “broke through” into the miner’s work shop. Now the problem was to widen the hole. The miners were enlisted to remove the debris from the widening and maintain clear access to the

escape route. Further drilling “problems” provided time to assess the condition of the rock through which the capsule would pass and make decisions regarding the need for, and process of, reinforcing the opening.

All the while that Plan B seemed to be pointed to success, the drills on Plans A and C continued to operate, serving as backup against unexpected problems.

Ultimately, with the world watching, the first miner came to the surface on Oct. 12. Twenty-two hours later, the 33rd miner came into view, and the impossible had been accomplished.

Looking back at the engineering involved, there was a significant amount of “engineering ingenuity,” but it also required a studied application of the Engineering Method. The initial step in the process was to develop a strategy that would allow the design team to begin moving toward a solution. Clearly the problem they were faced with in early August was “poorly understood or uncertain” and it required considerable effort to improve that understanding. As understanding improved, the strategy could be modified and new resources, both human and physical, could be brought into play. The team grew from one person on Aug.7 to more than 300 by Oct. 12.

Design causes something to come in place that did not exist before. That something need not be physical. In this case, the design was a process. It was a process of finding people with specific expertise that could be adapted, and existing technology that could be modified, to respond to a unique



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Chantal Guay, P.Eng., M.Env.
Engineers Canada
CEO Message

Engaging the Future

Over the past few months I have discussed Engineers Canada's outreach activities to encourage women and Aboriginals to join the engineering profession. An equally important group for the profession to reach out to is students – literally the future of the profession. We must demonstrate the benefits of engineering to students of all ages; from those who are already enrolled in engineering programs to those still in elementary school. The hope is to get more young Canadians interested and involved in engineering at an early age and to let them know that of the many career options out there, engineering is a world-changing, exciting, fun and rewarding choice.

We cannot afford to underestimate the important contribution students of all ages bring to the profession through innovative ideas and creative new approaches. Engineers Canada and its constituent associations have always taken the role of students in the future profession very seriously. Engineers Canada is actively involved with the Canadian Federation of Students (CFES). A representative of CFES attends each of our board meetings, we financially support CFES's participation in the Canadian Engineering Leadership Forum, and we are the proud official partner of the CFES's Annual Congress once again this year. As part of our connection to CFES, we also sponsor the Canadian Engineering Competition, an event that brings the best and brightest engineering students together in a professional environment to compete in communication, technical, and design skills, with the goal of

recognizing those who will go on to become future engineering leaders.

In other efforts to recognize future leaders, we have National Engineering Month, a celebration of engineering in March that sees elementary through to high school teachers and their students participate in community activities designed to showcase science, technology, engineering and math skills. Each constituent association has activities in its province or territory, ranging from career fairs to design competitions to the always popular bridge building contests. There are also student events that happen throughout the year, such as math and science competitions, and science and technology fairs. Many associations also have special programs in place to ensure that girls are given equal opportunity to participate in science and math.

In addition to these student activities, volunteer programs get professional engineers into the classrooms to help students develop science, technology, engineering and math literacy skills. This involvement and mentorship demonstrates to a new generation how cool engineering can be and how it contributes to society, and hopefully it will inspire students to choose engineering.

All of these student outreach activities are examples of the great work being done for potential engineers by our constituent associations, but we also need to make sure we continue to engage those who have chosen an engineering degree to join our community. We need to make sure that by the time a student has completed his or her education to

become a professional engineer, they are eager to join our profession and contribute to it as well. We cannot afford to miss such a great opportunity to get new graduates involved in the profession.

Therefore, it is very important that potential engineers are given every opportunity to both witness and demonstrate leadership, creativity, and collaboration. We must make certain our programs constantly evolve to help engineers remain engaged in the profession at all levels of their education and training, and ensure we connect with engineers at each stage: first as students, then as graduates of engineering programs, then as engineers-in-training, and finally as professional engineers throughout their careers.

I had the chance as an engineering student to be made aware of the meaning of being a professional engineer by one of my professors, and I would not be the person I am today if I had not received this influence very early on my path. Dr. Jean-Yves Chagnon, a retired professor of geological engineering at Université Laval and former chair of the Canadian Engineering Accreditation Board, was a great role model. Dr. Chagnon spoke very highly of the profession and the importance and value of the Professional Engineer designation. He instilled in me, the understanding of the responsibility that the designation entails. I am grateful to Dr. Chagnon for the influence he had on my career path and I thank him for his involvement in the engineering profession and his shining example that led me to get involved in it as well.

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Kumvana - EWB National Conference Report

In mid-January 2011, Engineers Without Borders Canada (EWB) hosted its 10th annual National Conference, the largest conference in EWB history by a factor of three.

The title of the conference was Kumvana, a word in Chichewa, the national language of Malawi, that means “unite so we may discuss and understand.” This is exactly what happened when well over a thousand delegates gathered in Toronto.

At the conference, people came together from Africa, Canada, and beyond, from many different backgrounds and interests. Therefore, one focus was to listen and build bridges from these multiple perspectives. EWB has long believed in the need for sophisticated rethinking in development, in broadly engaging Canadian engineers on this issue, and in challenging the oversimplified view of the public towards African development.

High-profile speakers such as Google.org General Manager Megan Smith, outspoken African anti-corruption spokesman John Githongo, and Complex Theory Economist Eric Beinhocker came together in an opening keynote address that set the tone for the event. Dozens of leaders from business, philanthropy, and academia also came to speak, including APEGM past President Dr. Ron Britton.

This was not a typical conference with peaks and troughs of intensity, and a reasonable bedtime. As always, the EWB conference was high energy from start to finish, a roller-coaster of eye-opening speeches and lively debate. “I am completely exhausted and want to sleep, but I just can’t miss anything!” said EWB Winnipeg Professional Chapter Member Nick Gilbert, who was sponsored by Stantec, his employer, to attend his first EWB conference.

Canada’s largest international development conference was held in a first-class facility that allowed 1500 people to congregate in a single location, then splinter off into more than 25 smaller groups for simultaneous discussion. The more intimate gatherings enabled everyone to not only attend the conference, but help define the way forward, going into the next decade of change.

It all came down to a basic engineering problem: to create

One of the many breakout sessions during the conference.

sustainable change in the most effective way possible. The pathway to a solution will be blazed by logic, reason and evidence, and guided by EWB’s vision.

One major innovation that was launched was the “Failure Report” and its accompanying website, admittingfailure.com, which aims to build “a community and a resource, all designed to establish new levels of transparency, collaboration, and innovation within the development sector.”

The willingness to accept, analyze, and even publish its failures springs from EWB’s core values: “EWB believes that success in development is not possible without taking risks and innovating – which inevitably means failing sometimes. We also believe that it’s important to publicly celebrate these failures, which allows us to share the lessons more broadly and create a culture that encourages creativity and calculated risk taking. This is a culture we value within EWB, and also try to work with our partners in Africa to create in their organizations.”

Another area that piqued many attendees’ interest was Global Engineering, which covered many topics, including: Legacies of Canadian



Engineers Without Borders CEO George Roter delivering a high energy speech about our successes, failures, and learnings.



Engineering, Defining the Global Engineer, Corporate Social Responsibility, Values and Systems Thinking, and Face of Engineers: Public Perception and Strategy.

Among other things, EWB exists to help engineers become aware of the great potential for positive impact in the world, and to become better equipped to bring about that change. Volunteers with an engineering background, driven by passion and global awareness, make up the majority of Engineers Without Borders. The conference sponsors, Hatch, Tetra Tech, and Xstrata, had the opportunity to network with hundreds of motivated engineers who have a desire to understand the complexities of the world in which they live and work.

With the largest conference in EWB's history, this event really did mark a turning point for the organization, as global development and social change continue to grow in relevance.

To read more about the 2011 EWB Conference please go to <http://conference2011.ewb.ca>. ■

EWB Local Chapter News

The Winnipeg Professional Chapter of Engineers Without Borders was launched just over a year ago by a group of engineers and others working to promote human development and seeking sustainable change for alleviating extreme poverty. In 2011 we plan to expand our impact by sending a volunteer overseas to Africa.

The Professional Fellowship program would enable a Winnipeg volunteer to spend four months in one of the four countries in Africa where EWB works—Ghana, Malawi, Zambia, or Burkina Faso—to assist long-term staff and share their technical skills.

In February 2011 we held our second annual Fair Trade Wine Tasting, while the second annual EWB Curling Bonspiel is scheduled for Mar. 19, 2011. For information about Professional Fellowship applications or upcoming local events, send us an email at winnipeg@ewb.ca or go to our website: winnipeg.ewb.ca.

U of M students can check out the EWB Manitoba Student Chapter at umanitoba.ewb.ca.



EPIC Educational Program Innovations Center

Upcoming Course Schedule	PDHs*	Location	2011			
			Apr	May	Jun	Aug
Civil						
Design and Maintenance of Roof Structures on Industrial Buildings	12	Winnipeg	28-29			
Structural Steel Connections - Design, Detail and Specifications	12	Regina		26-27		
Upgrading Bridge Inspection Skills	12	Winnipeg				3-4
Construction						
Cost Engineering - Effective Estimating and Cost Control of Construction Projects	12	Saskatoon				8-9
Electrical						
Electrical Design Concepts for Non-Electrical Engineers	18	Winnipeg	26-28			
Electrical Design for Industrial, Commercial and Institutional Facilities	24	Regina			14-17	
Environmental						
Achieving Water Quality Standards by Effective Stormwater Management	12	Winnipeg		9-10		
Small Communal Wastewater Treatment Systems	12	Winnipeg	27-28			
Mechanical						
Heat Exchangers - Design, Operation and Performance	16	Regina		2-4		
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Student Networking Dinner, Feb. 3, 2011

R. R. Foster

The APEGM Student Networking Dinner was held on Feb. 3 at the CanadInn Fort Garry. This annual event is well attended by both students and professionals. It gives engineering and geotechnical students a unique opportunity to rub shoulders with professional engineers and geoscientists. The students are certainly not bashful at learning how to network at a social event.

Following a prime rib dinner, our guest speaker was MaryAnn Mihychuk, MSc. P.Geo. Ms Mihychuk is a former Mines Minister in the Manitoba Government and is currently President of Corporate Relations Services, a Company heavily involved in the mining industry. MaryAnn's talk ranged widely over topics as diverse as economic recovery, social change, environmental issues, First Nations issues, Bipole III and baby boomers. Judging from the level of applause, it was a most excellent speech.

Following her address, Ms. Mihychuk ran a "speed dating" session to afford the students more opportunity to circulate among the tables and meet a good number of professionals.

However, the highlight of the evening was when your erstwhile Keystone Professional reporter won the door prize. But what are those little white hardhats for?

See you next year. ■

APEGM extends its appreciation and a hearty thanks to those firms who sponsored tables.

AECOM

AMEC Earth & Environmental

Crosier Kilgour & Partners Ltd.

Dillon Consulting Ltd.

FWS Industrial Projects

Genivar

Hatch

Hayles GeoScience Surveys Ltd.

KGS Group

Lafarge

Manitoba Infrastructure & Transportation

MMM Group

MTS Allstream

R. M. Godse Associates Ltd.

Sigfusson

Northern Ltd.

Standard Aero

Keynote Speaker Ms. MaryAnn Mihychuk, P.Geo.



Above: Students network with engineering professionals



Right: APEGM President Bill Girling, P.Eng.

Public Policy

Chris McNeil, P.Eng.

Note: The opinions expressed in this article are solely the author's and in no way reflect APEGM's position.

As engineers we are often asked the question "Can it be done?" We will then investigate the problem and come back with a professional opinion on whether it can be done and what it will cost. Very seldom are we asked the broader question "Should it be done?" This question cuts to the very role of what is an Engineers role in society. Should we be merely the technical experts who answer the technical questions or should we be leaders in public policy? And if so what should the role of APEGM and other provincial associations be if engineers are to be more involved in public policy?

Engineers, as highly trained professionals, are in a unique position in society to evaluate complex technical issues. Whether it is alternate energy, copyright law, mega construction projects or water protection, we are the profession that is best able to evaluate the impact on society of the choices that are made. As professionals we have a duty to those affected by these projects to protect their interests. I would argue that this extends to protecting not just the impact on safety and the environment but also the impact on the public purse.

The stability of society rests on financial stability and we as engineers can help ensure that the engineering decisions made today benefit the stability of our society tomorrow.

In my opinion Engineers need to become not the hidden profession but become more involved in public life. Very few Engineers in Canada hold public office and often technical policies are made by those who do not have the background to fully evaluate the issues at hand. Unfortunately there is currently no national organization for Engineers that are interested in helping shape public policy.

APEGM AND PROVINCIAL ASSOCIATIONS ROLE IN PUBLIC POLICY

The public policy question has recently come to the forefront in Manitoba due to a resolution at the APEGM 2010 Business Meeting regarding the routing of the HVDC transmission line (Bipole III) by Manitoba Hydro down the west side of Lake Manitoba. The resolution requested that APEGM take a public policy stand regarding the routing of this line. APEGM's first response to this resolution was to get a legal opinion that this resolution was out of order as it falls outside the scope of the Engineering act.

There is some debate on whether public policy issues fall under the umbrella of APEGM.

This is a complex issue that needs to be decided within APEGM and the legal framework. If it is decided that APEGM should take a more active public policy role then there are some real difficulties that could arise both internally and externally that I believe will limit its' effectiveness. As the licensing body APEGM could come into conflict with a large number of members who work for employers that other members feel are not making decisions in the best financial interest of society. APEGM could also easily come into conflict with the very same government bodies that are responsible for legislation that governs the profession. Although I am not suggesting that potential conflicts are reason to avoid taking stands on public policy, I would argue that such conflicts can greatly delay decision making and in effect is no better than not taking a position. I believe for this reason that provincial associations are not the best vehicle for engineers interested in public policy.

ALTERNATIVE

There is a simple alternative to APEGM and other provincial associations playing the lead role in public policy. I believe that the time has come for there to be an arms length organization for Canadian engineers who are interested in public policy. Such an organization would leave APEGM and other provincial associations to deal with licensing and regulatory issues and a second organization whose membership is voluntary to deal with public policy issues. There is currently only one such organization that I am aware of, The Ontario Centre for Engineering and Public Policy. I would suggest that this does not go far enough as policy decisions quite often have an impact on the country as a whole.

In this time of great technological advances there is no better time for engineers to step up to the plate and play a more prominent role in shaping the policies that help define our society. Whether it is by a new organization like I suggest, getting involved in the political process or encouraging the provincial associations to take a larger role in public policy, the decisions engineers make today will shape the future of our society.

If you have comments or interest in such an organization I can be reached at cappe@rocketmail.com. ■



First Manitoba-based Researcher Elected as Foreign Fellow to National Academy of Agricultural Sciences India

Dr. Digvir S. Jayas, Vice-President (Research) and Distinguished Professor at the University of Manitoba has earned an international reputation as a leading researcher in effective grain storage methods. The often referred to "leader of grain storage" has been elected as the 2011 Foreign Fellow into the National Academy of Agricultural Sciences (NAAS) India, for his outstanding contributions in the area of agricultural engineering and technology.

"Over the last two decades he has been recognized internationally for his research in understanding stored-grain ecosystems and the results of this research have helped in preserving grain for mankind," says Dr. H.S. Chauhan, retired dean (PG Studies), GB Pant University of Agriculture and Technology, Pantnagar, India.

Jayas, the fifth researcher in Canada and the first Manitoban to receive this honour, is a leader in carrying out interdisciplin-

ary research. He has integrated the work of entomologists, agricultural engineers, and mathematicians into the development of new methods of measuring, analyzing, and modeling (mathematically) the properties of grains, and heat and mass transfer in grain during storage.

"I want to thank Dr. Chauhan for nominating me into the academy. It is a great honour to be the first Manitoba-based researcher to be elected as Foreign Fellow," says Dr. Jayas.

Globally, about 2 billion tonnes of grains, oil-seeds, and pulses are produced annually and stored at different stages in the grain distribution chain between producer and consumer. The post-harvest losses for grains range from one per cent in some of the developed countries to 50 per cent in some of the less developed countries. Jayas' research and development in grain preservation techniques has had significant impact on reducing grain losses and has garnered him the Foreign Fellowship.

Dr. Jayas demonstrated experimentally that the resistance to airflow through bulk grain in the horizontal direction is about 30 to 40 per cent of the resistance to airflow in the vertical direction. This has led to the development of a prototype grain dryer (in collaboration with AgGrowth Industries) which forces air horizontally and dries grain more evenly and efficiently. The dryer also uses a fan which is one-half the capacity of a traditional vertical airflow dryer,

thus reducing energy consumption for grain drying.

Jayas has not only helped the scientific community throughout his research career, but also the grain economy in several countries. The tools and techniques developed by his research program have positively impacted grain storage, handling, and safety around the world.

The number of elected foreign fellows is limited to two in each successive year. Dr. Jayas, along with Dr. Tuteja, Senior Scientist, Plant Molecular Biology Group, International Centre for Genetic Engineering and Biotechnology, New Delhi, India, will be formally inducted on January 1, 2011.

NAAS, established in 1990, has a vision to gain recognition as a credible "Think Tank" to provide views of the scientific community on all agriculture-related policy issues, to encourage talent and promote excellence in science, making it a powerful instrument for the growth of the national economy, including a vibrant farm sector. As of 2010, the academy has a total of 497 fellows, which includes 45 Foreign Fellows and one Corporate Fellow.

For more information, please contact Melni Ghattora, research communications & marketing officer, University of Manitoba, at 204-474-9020. ■

continued from page 4, Engineering Philosophy 101

Vesely and Currie to research and publish The Hermetic Code, it is interesting to speculate on the possibility that the legislators who introduced the Manitoba Civil Engineer's Act in 1896 or our original Engineering Profession Act in 1920 might have had intentions that went beyond professional conduct. Was the use of the term "ethics," with all of its moral implications, intentional? ■

continued from page 7, Thoughts on Design

problem.

In the eyes of the public, Sougarret is considered to be a hero. In the eyes of our profession he should be considered as a role model. He is an engineer, in the fullest sense of the word. And his design saved the lives of 33 miners. ■



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GEOSCIENTISTS ESTABLISH NATIONAL FRAMEWORK FOR THE DEVELOPMENT AND MAINTENANCE OF PRACTICE GUIDELINES

Oliver Bonham, P.Geo.; CEO, Geoscientists Canada

After 18 months in the making, facilitated by Geoscientists Canada and involving all 10 geoscience professional associations, a national framework has recently been approved that will see - over time - the introduction of harmonized guidelines on professional geoscience practice across Canada.

As a practising geoscientist, you might ask why having guidelines in the first place and why the existence of a national framework on guidelines, in the second, is important to you.

Here are two key reasons:

- Practice guidelines in themselves set out a common level of expectation around a particular area of geoscience practice, not just for the individual practitioner, but also for your client or employer, the public at large, the profession as a whole, and government and other regulatory agencies. Guidelines identify the practice related matters that need to be considered in order to carry out a particular professional activity in a fashion which meets the obligations each geoscientist has under their governing professional legislation. In this way the practitioner is better equipped to meet their overarching responsibility to protect the public's interest, while at the same time managing both the risks and expectations associated with their work.

- Having a national framework on guidelines, means that over time, guidelines will become similar in structure across Canada. This is particularly important for those who are licensed and practice geoscience in multiple jurisdictions, or who are transferring to one province or territory from another. It will translate into improved and more consistent practices across jurisdictions, thus aiding practitioners to better

safeguard the public's interest coast to coast to coast.

The new framework, approved unanimously by the Geoscientists Canada board of directors at its meeting in November 2010, is entitled: "Framework for the Development of Geoscience Professional Practice Guidelines", a copy of which can be viewed on the Geoscientists Canada website www.ccpge.ca, or your association website at www.apegm.mb.ca.

Project work on the framework received funding assistance from the Government of Canada under its Labour Mobility program, administered by Human Resources and Skills Development Canada. An important focus of this program is to facilitate inter-provincial movement of skilled workers under Chapter 7 - the Labour Mobility chapter - of Canada's Agreement on Internal Trade.

All 10 associations were engaged in concluding the framework, while 7 were directly involved in its step-by-step development, through active participation on the project's national steering committee. Golder Associates, led by a team from the firm's Mississauga Ontario office, were consultants for the project, and Tony Lotimer, P.Geo., of the Association of Professional Geoscientists of Ontario, served as the very able chair of the steering committee.

The framework reviews the purpose of practice guidelines and the challenges associated with both developing and maintaining such documents. It then sets out collectively-agreed principles concerning: 1) identifying the need for guidelines for different types of practice; 2) the process and methodology that should be followed in preparing guidelines and 3) the structure and

components of a typical practice guideline.

Practice guidelines need to be specific to the particular province or territory for which they are intended because of the jurisdictional nature of geoscience licensure. The framework secures this need for difference arising from differing regulatory requirements as well as the independent mandate of each of the associations, operating under their own act. At the same time, it recognizes that all guidelines should reflect the same reliance on the appropriate use of geoscientific principles and the scientific method, and should carry similar expectations around independent professional judgment on which sound geoscience practice is based - all of which apply equally regardless of jurisdiction.

Geoscientists Canada is happy to have been able to facilitate the development of this important framework as it aligns very directly with its mission statement, which is "to develop consistent high standards for licensure and practice of geoscience, to facilitate national and international professional mobility, and to promote recognition of Canadian geoscientists."

In addition to extending thanks to all its member associations and their volunteer practitioners for their input and involvement in this important undertaking, Geoscientists Canada owes a special debt of thanks to the Association of Professional Engineers and Geoscientists of British Columbia which allowed its Council Policy on the Development of Practice Guidelines of April 25, 2008 to be used as a foundation text, and to Peter Mitchell, P.Eng. - APEGBC's Director Professional Standards and Development, who was an invaluable member of the national steering committee. ■

2010 AGM Award Recipients



Jane Polak Scowcroft, EIT
Recipient of the Professional-In-Training Award



Luis Escobar, PEng.
Recipient of the Early Achievement Award



The Manitoba Floodway Authority - The Red River Floodway Expansion Project - Recipient of the Certificate of Achievement Award



Marcia Friesen, PEng.
Recipient of the Leadership Award





D'Arcy Phillips
Recipient of the Champion of Engineering Education Award



Ramkrishna Godse, PEng.
Recipient of the Honorary Life Membership Award



Franklin Roberts, P.Eng.
Recipient of the Outstanding Service Award



Randy Herrmann, P.Eng.
Recipient of the Merit Award



Brandon University Unveils the new "APEGM Geoscience Gallery"

Wed., Jan. 26, 2011 - The executive of APEGM and the APEGM Foundation were invited to attend an open house at the Geology Department of Brandon University on Wed., Jan. 26, for the dedication of the new "APEGM Geoscience Gallery" display. This geoscience display is the new home to a skeleton of a Dromaeosaurus that existed 75 million years ago. A Dromaeosaurus was a 15 kg feathered carnivore with razor-sharp teeth, sickle-like claws on its feet, and a tail that plumed several feet behind it. This unique and rare gift is from the Royal Tyrrell Museum in Alberta.

In addition to the invited APEGM representatives, more than 170 elementary school students gathered at Brandon University's Faculty of Science to explore the Geology and Physics department facilities, and to see the dinosaur skeleton and new

geoscience display. Many of the students were participants in a contest to name the Dromaeosaurus skeleton.

Dr. Hamid Mumin, P.Eng./P.Geo. welcomed the many visitors on behalf of the Department of Geology. Dr. Mumin reported that 107 different names were submitted in the "Name the Dinosaur" contest. Dr. Mumin then introduced Tim Corkery, P.Geo., former president of APEGM, to present a copy of "Geologica, Earth's Dynamic Forces" to Madame Joanne Fournier-Touzain of Ecole Harrison, the contest winning school. Dr. Mumin then introduced Dr. Deborah Poff, President and Vice-Chancellor of Brandon University, who presented Madame Fournier-Touzain with a "Petrified Wood" plaque for the winning class. Dr. Austin Gulliver, Dean of Science, then presented a "Rock, Mineral, Fossil, Gem Kit" to Sydney Manko of Ecole Harrison, for her winning name entry, "Jerome the Dromaeosaurus." Sydney, who was delighted with her prize, is apparently a real "rock hound."

Dr. Poff then presented Mr. Corkery and Mr. Grant Koropatnick, Executive Director of APEGM, with a plaque from Brandon University in recognition of the gift from the APEGM Foun-

ation, the springboard for Jerome and his new home at Brandon University. APEGM's financial gift, and matching provincial funds from the Faculty of Science, were used for the acquisition of teaching specimens for display in the new glassed-in cabinet of the APEGM Geoscience Gallery. Additionally, representatives of the Brandon University Geology Students presented the APEGM attendees with gifts in recognition of the many years of support for field trips, conferences, and other professional activities that APEGM has provided for the students.

Grant Koropatnick responded by saying how much he enjoyed visiting the Department of Geology at Brandon, as one of his uncles was a graduate of the Department. He went on to say, "The APEGM Foundation's purpose is to support the education of engineers and geologists, and this project was a slam-dunk for us. Congratulations to Brandon University!"

The APEGM visitors then viewed some of the Geology Department's labs and met with a number of department staff, including Dr. Simon Pattison, Department Chair. ■

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What Lies Beneath

Winnipeg Hydrogeology and Groundwater Level Changes

Ganpat S. Lodha, Ph.D., P.Geo.

Mr. Frank Render, P.Eng., hydrogeologist and retired manager of a previously known groundwater section with the support of Mr. Bob Betcher, present manager of Water Stewardship Department, Government of Manitoba presented a Professional Development talk for the benefit of APEGM members on Nov. 30, 2010. His talk covered the topic of groundwater fluctuations in and around the Winnipeg area and the hydrogeology drawn from measurements in observation wells was discussed. Hydrographs showing average daily groundwater level variations from 1963 to the middle of November 2010 were presented. The piezometric surface maps of the carbonate aquifer derived from observed data during 1970 to 2010 were shown. The carbonate aquifer potentiometric surface difference map showing variation between springs of 1970 to 2009 was presented. The results showed that piezometric increases of one to seven meters have occurred in the central City caused by stoppage of 2.5 million gallons per day (mgd) of pumping and wet weather since the late 1980s.

The main aquifer under Winnipeg occurs in the upper 50 feet of the thick limestone rock sequence that underlies the City and the surrounding area. The permeability of the aquifer varies dramatically from place to place. The water levels in various parts of the city have fluctuated with the various groundwater usages and precipitation variations. The northern areas of the aquifer are replenished in the Stonewall area where the bedrock has thin cover. To the east and southeast there is recharge in the Anola and Sandilands areas and locally through the

Birds Hill sand and gravel deposits. In central Winnipeg, where there has been some concern expressed about increased pressures in the aquifer; the well water levels have risen some ten feet in the last three decades mainly due to decreases in private well pumping in various parts of the city.

Groundwater was used as a source of water by the early settlers. Around 1890, a line of wells was developed for the City, along Pipeline Road extending from the northwest corner of the city up to near Stoney Mountain. By 1919, when the city water system was converted to the present aqueduct, the groundwater pump rate reached 10 mgd. This pump rate created an extensive drawdown cone centered along Pipeline Road. Following the stop of city pumping, the water levels in the northwest recovered to near the ground surface. Over the last four decades the water levels have varied up and down annually by about three feet; with a maximum variation of 10 feet between high of 2010 and the low of 1990 levels to the west and northwest parts of the City with the exception of spring surges in wells near water courses. It must be recognized that groundwater levels tend to fluctuate on daily, weekly, seasonally, and over decades. The most dramatic area of water level lowering was in the eastern part of the city. This was caused from the 1940s to the late 1980s by the some one mgd of pumping by Swifts, Canada Packers, and smaller St. Boniface meat processing plants. The construction of the flood water diversion canal also had some impact. Once these operations ceased, the groundwater levels in the area recovered some 15 feet. In the wet years since 1995, there have

been another six feet of recovery; due to replenishment and also the fact that there is less water usage during these times. Groundwater springs in the bottom of the Red River Floodway tend to increase in flow as the aquifer piezometric surface rises, thus dampening the pressure increase. Because of this fact, it is unlikely we will see much more of a long term water level rise in the eastern city area.

In central Winnipeg, where there has been some concern expressed about increased pressures in the aquifer; the well water levels have risen some ten feet in the last three decades mainly due to decreases in private well pumping in various parts of the city. Of this rise, it is estimated that three feet during the last few years is due to increased recharge. Upward aquifer pressures in the central city area have increased by some four pounds per square inch. Fortunately, the permeability of the aquifer in this area is at some of the lowest values anywhere in the City. Thus most construction groundwater problems are easily manageable. A phenomenon that is notable from the view point of construction is that the aquifer water levels in the city tend to peak during spring flood periods and are lowest during the summer heavy pumpage intervals. In the City center area the average variation is nine feet; with a maximum change of 14 feet. This however is not likely to be any major problem in the core area of the city due to low transmissivity of the carbonate rocks.

In terms of water quality, the aquifer in general contains fresh water east of the Red River and north of the Assiniboine. South of the Assiniboine River, the aquifer water is brackish to saline. ■

Attract, Engage, and Develop the Next Generation

Owen Van Walleghem, P.Eng.

Consulting Engineers of Manitoba Young Professionals Committee (CEM YPC)



A major shift in employee demographics has arrived. This year, the first set of baby boomers will reach the traditional retirement age of 65.

In Canada, the number of people over 65 is expected to jump from four million to roughly 10 million by 2050, leaving a substantial knowledge and labour vacuum for organizations to contend with.

Part of the solution to this issue can be found in the generation currently entering the workforce. Members of this young group of professionals, known as “Generation Y” or the “Echo Boom,” are educated, ambitious and goal oriented. With proper planning, they can be instrumental in relieving the pressure that companies will face as large numbers of more experienced employees retire.

For businesses to cultivate this new generation of workers, it is important to develop strategies in three main areas:

- attracting young workers
- engaging and retaining new talent
- developing and transferring knowledge between generations

Not all members of any generation are exactly the same. There can be significant differences within a particular age group based on social factors such as culture, geography, religion, etc., but there are a number of traits generally shared by the Echo Boom generation that employers can use when developing tools to attract and retain these young workers.

Technologically Inclined

Generation Y is used to being plugged-in 24 hours a day. Online job searching is favoured over career fairs. Webinars and online resources are preferred over lecture based presentations and traditional libraries. Organizations that make use of online services such as these will have an easier time acquiring, training and developing young talent.

Technology has also made Generation Y efficient at multi-tasking, which can have a positive effect on their productivity. They may, however, have difficulty focusing for a long period of time on a single task. Companies offering a variety of assignments and challenges will help to keep these employees engaged.

This group is also skilled at networking by email, text message and social networking sites such as Facebook and LinkedIn. They are adept at developing large personal networks that can span the entire globe. Due to their highly social nature, they should be encouraged to develop their face-to-face networking skills through committee work and participation in seminars, conferences, and other social events.

Family-Centric

Work/life balance is a major factor for this generation when considering employment options. This generation prioritizes family over work, and many are willing to trade higher pay for more flexible schedules. Companies that offer benefits such as flextime, purchased vacation, parental leave, and sabbatical leave programs have an edge when it comes to attracting and retaining top talent from Generation Y.

Attention-seeking

Attention in the form of feedback and guidance is especially important to Generation Y. Reassurance and praise helps to



build their confidence. They like to know that their efforts are being noticed, and they feel encouraged to perform at higher levels when they receive positive feedback from their superiors and peers.

Achievement Oriented

This trait is a large benefit to organizations that nurture their young professionals. Generation Y is confident and ambitious. They actively seek challenges and opportunities to further their knowledge and careers, and enjoy developing innovative solutions to problems.

In 2009, the Consulting Engineers of Manitoba's Young Professionals Committee conducted a survey of young professionals at various consulting firms within the Province. Two recurring themes in the responses were the need for mentorship from senior employees, and the desire to be exposed to a wide range of tasks and assignments.

This sentiment is not unique to the consulting industry. Many young workers feel that developing a diverse range of skills, along with receiving strong guidance from mentors, is key to keeping them motivated to improve their skills and take on new challenges.

Companies that encourage innovation and provide continuous learning opportunities, tuition reimbursement, and a solid learning curve through diverse work assignments and mentorship opportunities will help keep these individuals engaged.

Team Players

Generation Y has a strong desire to be involved. They are loyal and committed if they feel included. Companies that encourage their participation in staff meetings, project meetings, committee work and social events will see a more

engaged workforce. Providing mentorship opportunities is also a great way for companies to build relationships with young professionals. Mentorship can help guide and develop their careers, and transfer knowledge and experience between the generations.

There are many ways for businesses to take advantage of these characteristics to help appeal to young workers and assist them in realizing their potential within organizations. Companies that recognize and embrace these traits, and create structured career development and mentoring programs around them, will be successful at attracting, motivating and retaining this dynamic group of young employees.

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JUMP TO THE PUMP

AN ARTICLE ON THE JAMES AVENUE PUMPING STATION –
1908 TO 1986

INTRODUCTION

As a means of celebrating the role of engineering and geoscience in the 91st year of APEGM's history, the Heritage Committee is writing a series of articles that link water to the economic and social development of the province. The first article described the relationship between commerce and water before the Association was formed. This article is a follow-up to the summer 2010 article on Winnipeg's water supply as it related to health and welfare. This is the story of the historic James Avenue Pumping Station, part of Winnipeg's early water supply system.

A safe clean and abundant water supply is essential to public health. It is also important for the protection of persons and property from fires. The value to the economy is reflected in many ways; the key in this case, is reduced insurance costs.

A BRIEF HISTORY

Winnipeg's first water system began in 1882 when a private company, Winnipeg Water Works Co., drew water from the Assiniboine River and distributed water by pipes to homes and businesses in the city core. The company's intake and pumping facilities were on the north bank of the Assiniboine River at the Maryland Bridge. However, fire protection for the mainly wood buildings was inadequate, resulting in loss of life and property, and high insurance costs.

In 1899, the City of Winnipeg purchased the system and began to use artesian wells rather than the foul river water. In 1904 a serious fire on Main Street threatened the entire business district and forced the City to pump Assiniboine River water into the mains. The contaminated water resulted in a typhoid epidemic with 1300 cases reported in the following days.

Winnipeg was experiencing an economic and population boom during the 1890s through the 1920s. Shortly after the 1904 fire, the Fire Underwriters' Association reported to Council that 'the city would find itself deficient of 3 million gallons of water based on the present rate of service, with over half the homes not yet serviced by water mains. The City's groundwater pumping station and 6.3 million gallon reservoir was located on McPhillips Street near Logan Avenue, three kilometres from the business district. In 1905, a new 10 million litre per day well was dug but with the rapid population

growth the supply was still inadequate. There was also a concern about drawing the water table down below the river level and thereby introducing contamination.

While studies were undertaken on ways to develop an abundant supply of fresh, safe, potable water, City Council directed its engineer, Col. Henry Ruttan 'to determine a long term solution to providing the rapidly growing business district with adequate fire protection in a manner which would not impair public health'. Large warehouses with wooden post and beam construction were springing up all over the warehouse district. These warehouses were part of a growing trade that supplied all of western Canada. A major problem the entrepreneurs were facing was Winnipeg's high fire insurance rates due to the limited ability of the fire department to fight fires.

In 1905, Col. Ruttan proposed a dedicated fire protection system drawing water from the Red River at the foot of James Avenue. Council approved and directed him to complete the works. Ruttan partially designed the high pressure fire protection system in 1906 and supervised the construction to completion in 1908.

THE HIGH PRESSURE SYSTEM

The high pressure system, designed to provide fire protection for the large buildings in the downtown, was built at a cost of \$1 million. The cost was largely borne by the businesses along the 12.8 km of high pressure mains. [With today's purchasing power the cost would equal over \$25M.] The fire mains and 70 hydrants were kept separate from the domestic water supply. The pumping system consisted of 3 main structures: the river intake and pumping station, the gas producing plant, and the gas storage tank. The design is a model for engineering with a careful view to reliability based on redundancy.

JAMES AVENUE PUMPING STATION

The pumping station building is 48 m by 28 m, steel frame, faced with buff coloured brick above a concrete substructure. The

It is interesting to note that one of the largest fires was the J.H. Ashdown Hardware Store (Winnipeg's merchant prince) on Main Street. In 1906, Ashdown won the city election for Mayor running on a platform recommending city ownership of utilities.

building is divided into 2 gabled bays, each having a crane running the length of the interior. The engine floor is 5.5 m below grade and the six pumps are in a trench below this. The pump suction and discharge header pipes are 600 mm diameter, in duplicate, all six pumps are connected to both pipes, either being sufficient capacity for the whole plant. The suction header is connected to a two compartment wet well. The water was originally conducted to the wet well by a 900 mm wood stave intake pipe that extended 130 m from the well to deep water in the river where a stone ballasted crib was located. In 1919 the station was connected to the new aqueduct, a source preferable to the muddy water of the Red River.

The pumps are triplex double acting piston pumps. The water was pumped into the mains at a pressure of 2,109 kpa (300 psi). The pumps were supplied by W. Jacks and Company of Glasgow. The six 2-cylinder gas engines were built by Crossley Brothers of Manchester, England. The engines for the larger pumps were 402 kW (540 hp) each and for the smaller pumps, 186 kW (250 hp) each. Steam and electricity to power the pumps were out of the question due to high standby costs. Standby costs for the gas engines were minimal.

Upon receipt of an alarm by telephone or fire box through the Central Fire Hall, the pressure automatically increased. Although the system consisted of a maze of valves, motors and pumps, all six pumps could be started and working to capacity in three and a half minutes from receiving a call.

The first of the pumping units was placed in service in November 1907, and the remaining units were completed by July 1, 1908 when the whole plant was practically completed and the operation was taken over by the city.

PRODUCER GAS SYSTEM AND STORAGE TANKS

The gas producing plant was attached to the pumping station. Coal or coke was heated in 4 boilers to produce a gas under

pressure. The gas was filtered, cooled, and piped to the gas storage tank east of the pumping station.

The plant had four massive Crossley type producers: two 373 kW (500 hp), and two 745 kW (1000 hp), with the necessary platforms, hoppers and piping. The plant had an overload capacity of fifty percent with selected coal and could make gas from anthracite, lignite, or any non-caking bituminous coal. The coal was delivered on railway track adjoining the building and unloaded via a hopper. An elevator fitted with rotary feeding gear ensured regular feed without choking and raised the coal above the producer hoppers. The elevator and conveyor were operated by a steam engine. Two air super-heaters with gas and air connections and dust collectors were attached to the producers. Each unit was supplied with a hot gas tubular boiler.

continued on page 24



James Avenue High Pressure Pumping Station, ca. 1980
(City of Winnipeg, Planning Department)

COL. HENRY N. RUTTAN: WINNIPEG CITY ENGINEER

Born in Ontario in 1848, Henry N. Ruttan learned engineering on the job with the Grand Trunk Railway starting in 1868. He also worked with Sanford Fleming, who was building the Intercolonial Railway. In the 1870s he began a two year study of municipal engineering, and, after working for municipalities in Ontario, came to Winnipeg in 1880 to start his own engineering business. In 1885 he was appointed the City Engineer, a position he held until retirement in 1914. Ruttan was a staunch proponent of public ownership of utilities,



including the City's own power system, quarry, and asphalt paving plant. He oversaw the infrastructure for a population growth from 16,000 in 1885 to 130,000 at his retirement.

He was an active supporter of the engineering profession and a charter member of the Canadian Society of Civil Engineering and was its president in 1910.

There is no doubt H.N. Ruttan was a formidable engineer. In addition to his engineering exploits he maintained a parallel career in military service, ultimately becoming a Lieutenant-Colonel. He was a Captain in the Little Black Devils in 1883, served in the Saskatchewan Rebellion in 1885, and had already served against the Fenians in 1866. On May 18, 1910 he was recalled to command the recently re-named "100th Winnipeg Grenadiers." Ruttan died in Winnipeg in 1925 at his home at 180 West Gate.

continued from page 4, Pump

Four wet scrubbers, fitted with tar sieves and filled with coke, removed the condensable hydrocarbons from the gas. Three centrifugal tar extractors completed the removal of the tar from the gas.

Two sawdust scrubbers, either of which was capable of removing any remaining impurities from the gas were placed near the inlet to the gas holder. In addition, centrifugal circulating pumps and Root air blowers were provided.

The cleaning plant was operated by two 13.4 kW Crossley engines, either of which had capacity to drive the whole plant.

An important feature of the installation was that there was a spare unit of each type of machine, so that in the case of a breakdown, the plant could still be operated to its rated capacity. Two steam boilers furnished additional steam for the producer and also drove the elevator and blower engines, and supplied steam for heating the buildings.

The gas holder and pumping station was connected with the city gas mains by a special 12" pipe for a full supply of gas should the producer gas system go out of service.

Much of the equipment for the James Avenue Station was supplied by the Crossley Brothers of Manchester, England. The two brothers, Francis (1839-97) and William J. (1844-1911) set up in 1867. William concentrated on the business side, Francis provided the engineering expertise. The brothers were committed Christians and strictly 'teetotal'. They would refuse to supply their products to companies such as breweries, of whom they did not approve.

One of their major contributions to manufacturing was the introduction of the assembly line. The Crossley system even influenced Henry Ford, who visited the plant at the turn of the 20th century.

The gas holder tank was steel with a facing of brick with the capacity to supply the pumps for from 1 ½ to 5 hours depending on the number of pumps running.

DISTRIBUTION SYSTEM

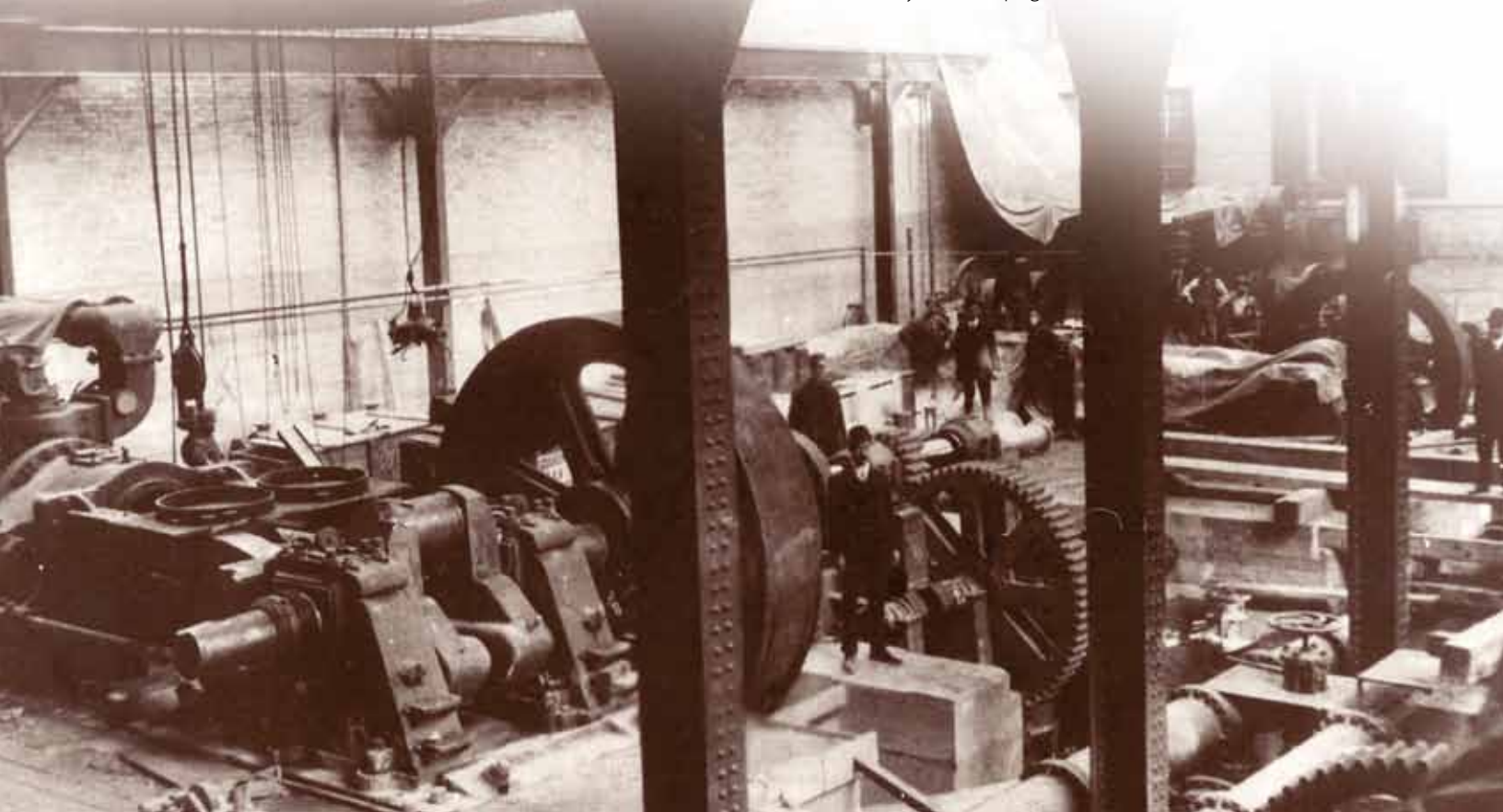
Two 500 mm fire system water mains were installed from the pumping station to Main Street by different routes, connected with sub-mains on the way. Each main had the capacity to take the water from the pumps when working to their rated capacity. Approximately 12.8 km of high pressure mains and 70 hydrants were installed to protect the city core. The mains ran on Main Street from Higgins Ave. to the Assiniboine River and on Portage Ave. from the Red River to Osborne Street, and on other streets.

The mains were designed for a working pressure of 2,109 kpa and the ability to withstand water hammer. The mains were tested at the foundry, and after installation were tested from 3,515 kpa to 4,922 kpa. The pipes were provided with extra heavy hubs and two lead grooves; they operated entirely satisfactory.

The hydrant valves were provided with pilot valves to fill the hydrant before opening the main valve against the pressure. Both valves were operated by the same stem.

IMPACT ON THE CITY

The dedicated high pressure system was very successful and no building adjacent to a burning building was lost afterward due to a lack of water. As a result insurance rates declined and the City continued its expansion at a dizzying rate. It was said that the water pressure generated by the pumping station could reach the height of a three story building as far away as Portage Ave. and Sherbrook St. at the site of the newly formed Manitoba Government Telephones' (MTS's forerunner) large telephone exchange building being built to service the St James area (then outside the city of Winnipeg).



A HERITAGE PRODUCTION EVEN IN 1908

When it was constructed in 1908 the high pressure system was one of the largest, most sophisticated, in the world. It was one of only two high pressure fire fighting systems in North America.

The Association of Professional Engineers, APEM at the time, considered taking the building over as a combination museum and office space in 1990, commissioning an architectural feasibility study on the concept. For various reasons, mostly funding, it never materialized.

The British Association, held its 1909 annual meeting in Winnipeg, and the members arranged a 'visit to The City Water Works High Pressure Plant, Artesian Well System' on Monday, August 30. The published invitation stated 'Colonel H. N. Ruttan, City Engineer, has kindly consented to act as guide to the party'. For the visit, he prepared an eight page description of the system entitled 'Winnipeg's Water Works' which largely featured the high pressure pumping station and fire fighting system. [The British Association rarely travelled outside of the UK for its annual meetings and in 1909 it would have been a long and arduous journey.]

In 1910, Col. Ruttan presented a paper on the innovative project at the AWWA (American Water Works Association) Convention in New Orleans which was published in the Conference Proceedings.

Today: A Grade II heritage building still looking for a tenant.

The gas producing plant and storage tank were demolished in 1962 when the pump engines were converted to natural gas and electricity. The pumping station was taken out of service in 1986, a victim of high operating costs, deteriorating water mains and modern pumper trucks that offer firefighters greater flexibility. But not before the station had been declared a Grade II heritage building by the Winnipeg Planning, Property, & Development department in 1982.

After the building was shut down in 1986 it was given to Winnipeg's CentreVenture corporation for development. CentreVenture sold it in 2001, including the original equipment and machinery, for \$159,000. Later, CentreVenture had a change of heart after a nightclub was proposed for the building, and bought it back for \$750,000. The most recent proposed use occurred in April 2010 when the press reported a market garden organization was contemplating using the lot for an outdoor market in the summer and the building for an indoor market in winter. To date

it remains undeveloped minus a large piece of machinery which the interim owners donated to a heritage museum in Austin.

WHAT CAN WE LEARN?

The James Avenue Pumping Station has lessons for all of us, as engineers and geoscientists in today's hurly burly fast paced world. Here are some that come into the Heritage Committee's collective thoughts:

1. Our forefathers were not shirkers –they showed determination and persistence.
2. They were far sighted and confident of the impact that good infrastructure could have on the growth of the city.
3. Private-Public partnerships are not new, 80% of the cost was raised by the merchants that the system ultimately protected.
4. Planned obsolescence was not in their DNA; to build in 1908 and have it operate, with small modifications, for close to eighty years shows vision.
5. As always, the Heritage Committee would be pleased to hear from anyone on this and any other engineering or geoscience story that highlights the contributions of the professions to the quality of life in Manitoba.

FOR FURTHER READING

1. The Manitoba Historical Society published an article on the pumping Station: Firewater - The James Avenue Pumping Station – Manitoba History, Number 13, Spring 1987.
2. The Western Canada 'Water' published the article 'Looking Back: Waterworks in the Early 20th Century, Winnipeg's James Avenue fire service pumping station', Winter 2009, by Bill Brant, Genivar. ■



Interior of the High Pressure Pumping Station during construction, ca 1906. (Courtesy of the City of Winnipeg)

Interior of the High Pressure Pumping Station, ca 1980. (Courtesy of the City of Winnipeg, Planning Department)

A call to Engineers:

The Community Greenhouse Project needs your help!

During the past two growing seasons, over 75 volunteers have worked together to transform the once derelict parking lot at 689 Maryland into an inner-city oasis. This project supports residents of the Spence area in growing their own food with the aim of improving their health and economic situation. SNA is a successful, grassroots run inner city renewal organization in Winnipeg. SNA works on Safety, Housing, Image & Greening, Youth, and Community Economic Development, and is guided by a five year community plan, fully informed by neighbourhood residents.

Located at 689 Maryland, the Spence Neighbourhood Association (SNA)'s Community Greenhouse Project is working toward installing a city water line to provide water for the 24 families who garden at this site. In order to get city approval for this, we must submit an engineer-stamped drawing of the desired water line. **We are looking for a volunteer civil engineer who would be interested in drafting this map.** If you are interested in this project, please contact Fiorina, Spark Recruitment Coordinator at 837-7275 (x3) or email: fiorinaspark@ccdnet-rcdec.ca



continued from page 9, Engineers Canada CEO Message

I encourage you, as a member of an amazing and world changing community, to promote the value of becoming a professional engineer to young minds by becoming a mentor to a student, a classroom volunteer, or a science fair judge. My wish is that you will recognize your great contribution to society as an engineer and recognize how you can have an influence on a student contemplating his or her next steps by getting involved in the future of the profession right now. ■

APEGM is asking members to promote the **Call for Nominations** for the following APEGM awards to be presented at future Annual APEGM Awards Dinners:

- Certificate of Achievement
- Early Achievement Award
- Member-in-Training Award
- Honorary Life Membership
- Leadership Award
- Merit Award
- Outstanding Service Award

If you are aware of **Manitoba engineers or geoscientists** who are deserving of an award, please submit your completed Nomination form, available through the APEGM office or website.

Your help in this regard is pivotal to the ongoing success of the awards program, and to ensure that Manitoba's most worthy

professional engineers and geoscientists are recognized for their contributions to our professions and society.



www.apegm.mb.ca



Alumni Association Launched

Last January 19th saw the first gathering of the Internationally Educated Engineering Graduates (IEEQ) Alumni Association at APEGM's office on Pembina Avenue.

Some 30 attendees including other international graduates who satisfy registration requirements as set out by APEGM answered the call to meet and discuss the platform on which this new group would stand and the regulations that would guide it.

The alumni initiative is being lead by a five member volunteer steering committee comprising of Sebastian Walrond P.Eng (Chair), Izzatbir Sethi P.Eng, Yurim Soler P.Eng, Mitko Tomov P.Eng, and Anh Dough EIT. They have been meeting since last October formulating the objectives of the group, looking at mechanisms to achieve desired targets and various member benefits.

The alumni group has set a goal of establishing a bursary at the University of Manitoba for students pursuing accreditation via the IEEQ program and becoming a resource to the program by volunteering as mentors and coaches.

The alumni group also plans to participate in public speaking and will target a number of Newcomer Organizations and Manitoba Labour and Immigration. Emphasis will be to educate on engineering registration requirements and the relevance of Canadian engineering standards to recent immigrants and other interest groups.

Three sub committees in the areas of Public Relations, Mentoring, and Membership are being formed for which volunteers are being sought.

The group will come together again in the Fall would like to invite APEGM Members and MITs who have fulfilled their registration requirements via confirmatory exams or similar and would like to volunteer or attend the next meeting, to contact us at ieeqalumni@gmail.com. ■

editor's note:

Your comments are always welcome by the Communications Committee through commfeedback@apegm.mb.ca.

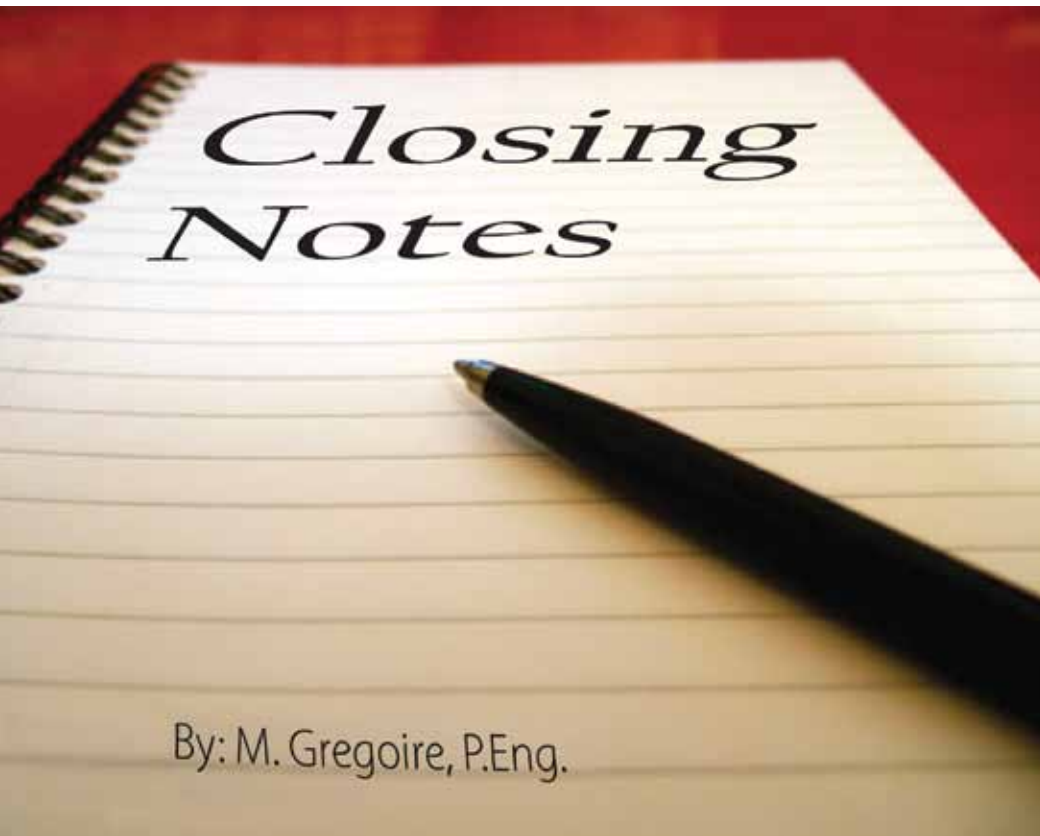
Advertising in the Keystone Professional: Advertising will generally be limited to products and services of technical or professional interest to members of the Association. They can include: engineering, geological, or geophysical services, educational products and services supporting continuing professional education and development, employment opportunities, and financial services.

The publication is produced using full-colour process (CMYK), however, Advertisers have the option to submit black & white advertisements instead.

Would you or your company like to advertise in an upcoming issue of the Keystone Professional? More information, including our full Advertising Policy, Mechanical/General Information, and Insertion Order form can be found at www.apegm.mb.ca/KeystoneAdvertising.html or by contacting Angela Moore at amoore@apegm.mb.ca.

Note:

If you would like to review the council minutes, they can be found online at www.apegm.mb.ca



Entering Fully into the Digital World

There were some notable by-law changes adopted by APEGM's membership this past fall. These included online voting for future by-law changes and councilors, as well as changes to the By-Law 11.1 Use of the Seal. Included in the changes to By-Law 11.1 was the allowance for digitally signing documents.

Prior to this allowance, members have been required to manually sign every document that they issue. Even if the report or drawing was generated entirely using software, these documents would have to be printed and then signed by the member. This process always seemed unnecessarily cumbersome to me.

In many scenarios, the documents produced by our members are sent to the recipient or client by e-mail. In order to comply with APEGM's By-Laws, manually signed documents need to be scanned back into electronic format before being issued.

As we are all aware, we are also bound to maintain originals of all the documents we issue. Manually signed drawings and reports generate a hefty bulk of paper that must be stored and managed.

Now that members have the option

to digitally sign their documents, there is a possibility to reduce the amount of time they spend on mundane tasks. The act of digitally signing a document is not only a quick process; it can also eliminate the need to generate a physical copy of a document. Even in scenarios where a client insists on receiving hard copies of authenticated documents, the member can digitally sign and issue the documents by e-mail, following up that e-mail with hard copies. Aside from eliminating the need to cramp your wrist by manually signing a pile of paper, there is undoubtedly savings in management and storage of the original documents. There are other advantages, too.

To understand those advantages, a basic understanding of the digital signature is required. I'm not the best person to describe it, but I'll give it a shot. First of all, it has nothing to do with what your name looks like when you've put pen to paper. It is, in fact, a string of binary digits added to your document. Like your manual signature, though, each digital signature is unique, yet identifiable as being created by you.

One principle that is essential to understanding how a digital signature works is the use of a private key and a public key. Keys are parameters that are assigned by the organization who manages the signatures. It is, essentially, a number (a really BIG number). A private key is one that

only the signer knows and the public one is, well ...

Another principle that is important to understand is the hash function, which is a method of creating a unique identifier (hash) for a given set of data. How the hash is generated isn't important in understanding this process, but its uniqueness is. For example, if a single phrase is converted into a 160 bit hash, modifying one character in that sentence could change half of the 160 bits in the hash.

When you authenticate a document using digital signature software, an algorithm is applied to the document's hash using your private key. The output of this process is written into the document. The resulting new document is the one that is digitally signed.

Clients and other recipients of the document can then verify the authenticity of your signature. Using the public key, they can have the document analyzed to determine two things of importance to them. The first thing they can verify is that you truly did authenticate the document. The other aspect they can determine is whether or not the document has been modified since it was issued, and this is one area where the digital signature exceeds the manual one.

With a manual signature, only the area where the signature is applied can be guaranteed to still be in its original state. In a 15 page report, pages one through 14 can be replaced entirely while the last page, the one that contains the manual signature, gives the appearance that the member agrees with all of the contents. Since a digital signature is applied to the entire document, absolutely no changes can be made without the recipient knowing that a modification has occurred.

APEGM just recently entered into an agreement with Notarius to provide our members with a digital signature solution. Notarius is a non-profit organization that was started by Quebec's notaries. Their system has been in place for about 15 years and is being used by APEGBC, APEGGA and OIQ.

In addition to the digital signature solution and the benefits this software provides to our members, Notarius' package also provides a PDF writer, encryption software, and other value. I encourage everybody to check out the demos on their website (<http://www.notarius.com/en/welcome/>) and to contact me with any questions. ■

Detach page for posting

Upcoming Events

Notarius - Electronic Signatures

Notarius is pleased to invite you to a short 1 hour presentation on the use of APEGM digital signatures and how it can help reduce costs, improve office efficiencies and provide a modern method for archiving original documents. Summary of presentation:

- 1-Who is Notarius?
- 2-Our role with APEGM Engineers.
- 3-How can you sign electronic documents?
- 4-Full product demonstration of the Notarius Signature Kit
- 5-Review of digital signature benefits in modern business operations?
- 6-Q & A

Date: March 15, 2011

Time:
11:30 a.m. - 1:30 p.m.

Cost:
\$20.00 Pre-Registration
\$15.00 Student Members
\$25.00 At the Door

Location: Viscount Gort Hotel, 1670 Portage Avenue, Winnipeg, MB

Sharpening Your Written Communication Skills

This will be a highly interactive two days of instruction. The course leader will provide detailed instruction on, and provide numerous opportunities to practice, how to identify key information and focus readers' attention. Also, learn how to plan and write email, letters, reports and proposals. There will be exercises with individual and group practice, followed by discussion and feedback.

Counts as 14.0 Professional Development (PD) contact hours.

Optional: Textbook Get to the Point! for an additional \$39.95. To register call 474-2736 ext. 223 and leave your name and telephone number. Registration is limited to a maximum of 20 participants so register early!

Date: April 11 & 12, 2011

Time:
8:00 a.m. - 5:00 p.m.

Cost:
\$365.00

Location: APEGM Office, 870 Pembina Highway, Winnipeg, MB

Techniques for Making Effective Oral Presentations

This will be a highly interactive day of instruction. By the end of the course participants will be able to:

1. identify an audience's primary interest, and develop a topic to satisfy the audience's needs,
2. establish an approachable, positive, yet businesslike presence,
3. organize information to keep the presentation concise yet complete, and
4. develop confidence in speaking informally or formally to an audience.

Participants will be asked to bring at least one topic with them that they can develop into a presentation.

To register call 474-2736 ext. 223 and leave your name and telephone number. Registration is limited to a maximum of 10 participants so register early!

Date: April 13, 2011

Time:
8:00 a.m. - 5:00 p.m.

Cost:
\$225.00

Location: APEGM Office, 870 Pembina Highway, Winnipeg, MB

8th Annual Making Links Engineering Classic Golf Tournament

Proudly Sponsored by Great West Life.

The first 220 registered golfers with accompanying payment will play. Entries and payment are to be submitted to the APEGM office by 4:30 pm on Friday, May 20, 2011. Register Early - has sold out last 4 years!

Contact Angela Moore at amoore@apegm.mb.ca for more information, sponsorship opportunities and registration.

Date: June 16, 2011

Time:

11:00 a.m. BBQ Lunch

Cost:

\$195.00 Individual

\$750.00 Team of 4

Location: The Links at Quarry Oaks, Steinbach, MB

New Members Registered November 2010, December 2010, & January 2011

M.E. Ahmed	R.J.N. Cool	P.N. Goettler	M.D. Limin	J.W. Rodger	M. Tremblay
M.R. Alam	W.P. Corcoran	J.J.M. Greshuk	X.H. Liu	D.M. Rogowsky	P. Trkulja
T.S. Alexander	V.J. Cordova	S. Hafeez	J.C. Lopez	M.A.L. Roy	M.N. Uddin
D.R. Aming	P. Couture	S.R. Hall	W.L. Marcinyshyn	M.W. Rupke	A.E.H. Uderstadt
J.J.N. Anderson	R.H. Daavettile	M.A. Hatzinikolas	K.M. Mazurek	R. Sadatalhosseini	J. Van Egmond
L.W. Argue	M. Dadgardoust	M.A. Heimersson	J.A. Mercado	J.J.A. Sakalauski	O.R. Van Wallegem
M.G. Arnaud	F. Dansereau	J.P. Hemke	R. Mireault	E. Sarsu	D.E. Vande Graaf
S. Aryan	H.S.A. Dessureault	M. Heppell	D.E. Muhurdarevic	R.E. Sauddin	M.C. Waggoner
M.B. Baxter	A.K. Dey	L.F. Humble	J.H. Nault	M.D. Schmeling	P.J. Wagner
J.C. Beddoes	W.J. Dick	H.S. Hunter	T.M. Ngatched	R.A. Schmidt	C.F. Walford
K. Belanger	V.G. Dominguez	D.K. Isleifson	Nkouatchah	M. Sivakumar	A.D. Wasnea
H.H. Bilesky	Tarango	A.A. Karagiannis	L.T.A. Nguyen	D. Smith	N.T. Weir
B. Bogdanovic	Y. Du	R. Kaviani	R. Niraula	W.B. Smith	A. Weissman
B. Bona	B.R.T. Dube	M. Khalekuzzaman	O.A. Ojo	N.P. Spence	M.R. Weselowski
A.B. Bragg	O.D. Duff	M. Knyazher	E.J.C. Ong	J.J.M. St.Pierre	H. Widjaya
A.J. Brookes	D.L.J. Duguay	J.W. Kozub	M.S. Paknia	D.J. Staples	P.J. Wilson
G.W. Brown	A. Dune	Z. Lakatos	N.S. Parry	B.J. Steele	N.R. Wittmeier
J.D. Campbell	K.C. Einarsson	D. Lamarre	J.C. Paslawski	M.B. Steindel	H.B. Xiao
S.P. Campbell	C.W. Evans	E.W. Lambert	M.W. Paulsen	K.E. Stienstra	R.M. Yee
Y. Cao	M.H. Fairbairn	B.F. Laviolette	K.A. Pietila	B.G. Stone	
C.R. Caswill	B.J.N. Fast	G. Le Brun	D.G. Porterfield	A. Suvorov	
C.A. Churchman	R.F. Gerus	K.W. Leonard	C.L. Propp	J.L. Sylvestre	
G. Constantinescu	M. Ghimire	C.S. Leung	C.A. Reed	B.S.B. Tang	
D.P. Cook	A.F.M. Girgis	N.J. Li	J.E. Roberts	J.M. Todd	

Members-In-Training Enrolled November 2010, December 2010, & January 2011

N.W. Abercrombie	L.C. Braun	G.T.L. Fediuk	M.I. Khan	I.D. Naften	P. Tam
H.M. Abu	A.M. Brawerman	J.A.T. Fichtner	P.W. Klassen	W.W. Ng	W. Tian
Ghazaleh	A. Buttnor	J.L. Fiebelkorn	H.C. Kouessi	A. Nunez Garcia	B.F. Valla
O.A. Adejoye	T.M. Camana	K.R. Forhan	D. Kuzmenko	N.K. Ochani	M.R. Van Die
R.A. Alcartado	R.G. Campbell	B.A. Hanson	M.S. Langan	C.C. Peters	Y. Wei
L.M. Almeida	T.R. Christiansen	K.A. Hearson	F. Lavoie	X. Ren	G.J. Whiffen
A. Amine	C.J. Delavau	T.Y. Ilyas	T.J. Layer	Y. Roca Pinero	E.D.R. Yazon
M.J. Baranowski	A.P. Dissanayaka	A.T. Intac	J. Li	A.M. Schoonbaert	X.G. Yu
A.B.W. Barton	Mudiyansele	E.A. Kaddari	S.K. Mann	S. Siddiqua	Z.C. Yu
V.F.N. Besharat	N.J. Dueck	I. Kahankova	R.S. Mattu	P.M.A. Slota	Y. Yuan
M. Bijeljanin	M.D.J. Duenas	J.S. Kaler	B.J.D. McCormac	M.S. Stelmack	

Certificates of Authorization November 2010, December 2010, & January 2011

Almita Piling Inc.	Gannett Fleming, Inc.	Ready Engineering Corporation
Aurora Engineering Ltd.	GENIVAR Inc.	Rempel Engineering & Management Ltd.
BRUNS-PAK Data Center Engineering	Grandview Energy Inc.	ROCHON EXPERTS-CONSEILS INC.
Catch Engineering Corporation	HOCS Projects	Telgian Corporation
DIALOG Manitoba Architecture	I.I.C. ENGINEERING	TELSTORM Corporation
Engineering Interior Design Planning Inc.	J.M. Giffin Engineering Inc.	Thomas A. Fekete Ltd.
Dick Engineering Inc.	Laviolette Engineering Ltd.	Uderstadt Associates Inc.
EARTH4U Consulting Inc.	McCormick Rankin Corporation	VWNA Winnipeg Inc.
Egmond Associates Ltd.	Nimbus Projects Ltd.	ZOLTAN Engineering Inc.
FWT, LLC.	NORDMIN ENGINEERING LTD.	
	Pharaoh Engineering Ltd.	

Why critical illness insurance?

How it can ease the financial burden for your family

Despite medical advances, critical illness is still common. In fact, the chances of you — or a close family member — being diagnosed with a critical illness are very real.

- Every hour of every day, about 20 people will be diagnosed with some type of cancer across Canada¹
- 40% of Canadian women and 45% of men will develop cancer during their lifetimes¹
- There are an estimated 70,000 heart attacks each year in Canada (that's one heart attack every 7 minutes)²
- There are over 50,000 strokes in Canada each year (that's one stroke every 10 minutes)²

Although more people survive critical illness, they may live with the economic impact for the rest of their lives.

Can you afford the costs of being critically ill?

Being diagnosed with a critical illness doesn't only spell emotional and physical distress. It can have an enormous cost for people living with the disease and for their families.

“The financial burden can be as stressful as the disease. The financial impact can last longer than the disease itself.”

Unfortunately, public health services in Canada do not pay for all costs associated with critical illness. Many costs of treatment must be paid for by the patient, including some drugs, medical supplies and prosthetics. The average cost of newer cancer drugs alone is \$65,000 per course of treatment.¹

Persons living with critical illness usually have to take time off work for treatment and recovery. Loss of work or return to work at a lower salary can have long-term effects. Pension benefits may be lost or reduced. Debts may take years to repay. The standard of living for the patient and their family may be permanently reduced.

If you are self-employed, your situation may be even more uncertain than for those with jobs and benefits — you may have no

By the numbers:

- 63** The percentage of Canadians who admit they have no plan ready in case they are diagnosed with a critical illness³
- 75** The percentage of Canadians who are concerned about having enough money if they became critically ill⁴
- 18** The number of conditions covered by the Engineers Canada-sponsored Critical Illness Plan

income during treatment and recovery because you are not eligible for Employment Insurance benefits.

How critical illness insurance can help

Unlike monthly disability benefits that cover your regular household expenses, critical illness insurance pays you a lump sum up front for more flexibility in meeting many other expenses. These could include costs for drugs, travel to and from treatment, meals, housekeeping and to allow your spouse to take time off work to care for you.

The Engineers Canada-sponsored Critical Illness Plan is available for you and your spouse in coverage amounts ranging from \$25,000 to \$1 million. The lump-sum benefit is paid directly to the insured upon diagnosis of life-threatening cancer, heart attack, stroke or up to 15 other common covered conditions.

¹ Canadian Cancer Society's Steering Committee: Canadian Cancer Statistics 2010. Toronto: Canadian Cancer Society, 2010.

² Heart & Stroke Foundation Statistics.

³ Redfern Research, March 2009.

⁴ LIMRA, Tracking Opinions of the Public in Canada (Financial Products), 2009.

Save 10% on your premiums on coverage of \$125,000 or more with the Engineers Canada-sponsored Critical Illness Plan.

To learn more and to apply:

manulife.com/EngineersCanadaCI

1-877-598-2273 (Monday-Friday, 8 a.m. to 8 p.m. ET)

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