

THE KEYSTONE PROFESSIONAL



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

AUGUST 1999
www.apegm.mb.ca

1999 Manitoba Schools Science Symposium

By: C.A. Nieuwenburg, P.Eng.

With more than 700 projects to choose from, selecting candidates for the APEGM-sponsored awards at the Manitoba Schools Science Symposium (MSSS) is no small feat. For the ninth year in a row, what is now your Image Enhancement Committee arranged for a number of APEGM members (12 this year, including yours truly) to volunteer several hours of their time, on the evening of April 23 and the morning of April 24, to judge science projects. Equipped with only pencil and clipboard, these brave individuals fought their way through aisles crowded with project paraphernalia, students, lawn chairs, and concerned parents to peer into the young minds of tomorrow's potential engineers and geoscientists. Our goal was to find a grade 12 student bound for the Faculty of Engineering at the University of Manitoba who would be deserving of a \$500.00 scholarship, and four students between the ages of 10 and 16 whose demonstrated interest in engineering could be further cultivated by attending the Careers in Engineering module of the Mini-U Program at the U of M.



Daniel received – he was chosen by MSSS as one of the students they would send to Edmonton to represent Manitoba in the Canada-wide Science Fair.

As usual, it was particularly difficult to narrow the field of enthusiastic and exceptional students who would be granted the Mini-U enrollments. When the dust settled, our chosen few were as follows: Apoorva Balakrishnan, a Grade 7 student at Acadia Junior High, for her project entitled "Magic of Muscle Wire"; Katie Szilagyi and

Karina Reuther, Grade 8 students at Stonewall Centennial, for their project entitled "River Cutters", and Rebecca Coish, a Grade 9 student at St. John's Ravenscourt, for her project entitled "Bettyworks – An Examination of Polyhedral Domes". Peter Washchysyn, APEGM Past-President, represented our Association at the Major Awards Ceremony held on April 25 and reported that each of our award winners was on hand to eagerly accept his/her prize.

APEGM extends its appreciation to Peter, along with this year's vol-

unteer judges, namely Randy Cameron, Kristin Huminuk, John Hunt, Kelly Hunter, Chris Kroeker, Rene LaFleche, Jeff McKay, Mitch Omichinski, Richard Sawka, Brian Trenholm and Irene Wasilewski. My personal gratitude goes out to Kelly Hunter and Brian Trenholm, along with Kris Dick and Gene Manchur, who have participated on APEGM's behalf in most of the past nine years.



Mini-U Scholarship Winner
Rebecca Coish.

The Image Enhancement Committee will be reviewing the type of awards being sponsored by APEGM for next year's MSSS, in order to assess whether adjustments need to be made to reflect our new Association. ■



Daniel Wiebe, U of M Scholarship Winner.

This year's scholarship winner was Daniel Wiebe, of Maples Collegiate, for his project entitled "Portable Executable File Modification". Ours wasn't the only award

Self-Governance at Risk? Members Respond to Presidents' Messages

From the Editor:

While resident in Alberta, I was President of our local elementary school for two years. The first year was quiet and success was counted as any time you met quorum for a committee meeting. Then the Department of Education announced its plan to close the school and the responses from the neighbourhood were immediate, numerous and full-throated. Well, last month's Presi-

dents' messages from Ron Britton (APEGM) and Dan Levert (CCPE) have elicited a similar response from some of our members.

The issues, you will recall, were the dispute with Memorial University over the use of the words "software engineering," and a decision by the Association of Professional Engineers and Geoscientists of Newfoundland to remove consent for accredited evaluations of the University's engineering programs

until such time as the University agreed to change the name. The Supreme Court of Newfoundland subsequently quashed APEGN's ruling. The matter of the use of the words "software engineering" goes to court in September. If the decision goes against APEGN, will the public be confused as to who is qualified and who is not qualified to call themselves engineers? Will our authority and ability to practice self-

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The Communications Committee would like to hear from you. Comments on your newsletter can be forwarded to us through the Association office or e-mailed directly to the Chair at stimpson@cc.umanitoba.ca. Members are also encouraged to submit articles and photos on engineering or business topics that would be of interest to the membership.

Although the information contained in this publication is believed to be correct, no representation or warranty, expressed or implied, is made as to its accuracy and completeness. Opinions expressed are not necessarily those held by the APEGM or the APEGM Council.

Communicating Electronically – What You Gain, What You May Lose

By: B. Stimpson, P.Eng.

As a society in which businesses and organizations must be able to exchange information rapidly in order to compete and survive, we have jumped enthusiastically into electronic communication, just as we once welcomed television and other earlier communications media. The impacts of these technologies on society and organizations is always a matter of research “after the event,” so to speak, rather than as a consideration during their development. It is, of course, questionable whether we would have the prescience to see all the ramifications of a given technology even if we put our minds to that task. Impacts are invariably more far-reaching than simply an increase in productivity or, as in the case of the television, an alternative to the theatre. Television, for example, has radically changed the socialization of children and the role of parents as “filters” and guardians of knowledge, morals and traditions.

The societal impact of the most recent forms of electronic communication – notably e-mail, video-conferencing, and the Internet – will provide a rich “vein” of research for social scientists

and communications specialists for years to come, but researchers already have made some interesting observations. As with every form of communication there are gains and losses.

How does the interaction between people differ between electronic and face-to-face communication? In a study of “collaboratories,” in which scientists and engineers, though separated geographically, perform research together by accessing instrumentation remotely and by sharing data, computers, and digital libraries, it was found that people are more likely to share ideas and also perform better in brain-storming roles. Electronic contributions are generally larger, more complex, and more carefully developed and thought out than in face-to-face exchanges. One reason for this may be the absence of status cues that can negatively impact direct encounters. There is also some indication that opportunities for mentoring and the frequency and quality of interactions are enhanced. Such electronic interchange works best if there have been prior face-to-face contact. In one study, groups were asked to play an elec-

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Licences Issued May & June 1999

F. Agharazi (QC)	A. Ishak (ON)
M.H. Berry (NY)	D.R. Iverson (MN)
S.H. Carroll (BC)	P.J. Kelly (FL)
H.D. Cohen (ON)	J.J. Miedema (ON)
R.C. Davis (ON)	C.L. Navratil (AB)
R.E. Diedrich (OR)	C.A. Palumbo (FL)
E.E. Donahue (WA)	L.K. Pauls (WA)
T.G. Fowler (NY)	M.P. Roxburgh (FL)
P.D. Galloway (NJ)	R. Sack-Tina (ON)
M.P. Goslow (FL)	M.E. Shewchuk (AB)
J.M.P. Holland (ON)	G.R. Spencer (FL)

New Members Registered May & June 1999

F.R. Ara	R.M. Lemoine
A. Aziz	R.L. Maniere
C.W. Baseraba	R.R.J. Nault
D.C. Billing (ON)	T.S. Parsons
C. Casale (ON)	R.A.S. Reichelt
M.D. Chekki	P. Salvian (AB)
F.J.J. Coreau	D.P. Schlereth (AB)
P.J. Dimmell (AB)	E. Sieber (ON)
C.L. Dyck	K.A. Sutherland
C.J. English (BC)	E.M. Talsma (BC)
G.W. Ferris	P.D. Tataryn
K.I. Franklin	M.K. Thomlinson
K.J. Freeman	A.A. Toms (NF)
J.M. Giles	S. Unger (ON)
S.E. Hage (AB)	G.R. Wickham (ON)
R.D. Hounsflow (BC)	K.C. Wong (ON)
M.K. Klassen	

Reinstatements May & June 1999

G.A. Smith	R.L. Steele
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EITs Enrolled May & June 1999

M. Arapovic	L.E. Liem
N.R. Aquino	G.D. McDermid
K.B. Brown	G.K.D. North
J.R.L. Cousin	R. Rasidescu
J.T. Doering	P.K. Roberts
A.M. Duester	R. Sathiamoorthy
J.S.T. Dunn	C. Shafai
D. Federkevic	S.J. Shelemy
K.G. Ferens	E.S. Tan
C.G. Graham	M.K.B. Thiessen
D.J. Hoorman	L. Travica
G.A.M. Horeczy	B.R. Wanas
D.P. Kuenstler	B.K. Williams

Resignations June 30, 1999

F. Amjadi	A.J. McFarland
S.C. Arabsky	R.K. McLean
T.S. Biberdorf	H.L. MacKenzie
B.W.B. Chin	A.S. Murison
T.J. Cook	J.W. Pottie
R.N.H. Dickson	M.C. Ruta
D.M. Ehman	D.J. Steski
P.T. Elefsiniotis	A.Sus
L.D. Keil	P.G.S. Trainor
G.S. Kidd	K.A. Wilson
B. Loewen	P.A. Wright
E.B. Loewen	B.A. Yurkiw

EIT Resignations June 30, 1999

C.J. Domytrak	K.V. Pardoski
Z. Feng	B.L. Serger
S.A. Fontoura	K.W. Simbeya
H.K. Man	Z. Siveski
L.A. Moffat	





President's Message

Ron Britton, P.Eng.

The Devil is in the Details

The Engineering and Geoscientific Professions Act states, in Part 2, Clause 3, that ... "The purpose of the association is to govern and regulate the practice of professional engineering and professional geoscience in the Province of Manitoba." It then goes on through an additional 74 clauses to define what the Association can, and cannot, do. That would seem to provide a sound base upon which to build.

The next enabling step under the Act requires that APEGM members elect a Council which "shall govern the association and administer its affairs". Again, this seems straightforward enough for most professionals to handle. Unfortunately, as every new Councillor soon discovers, things quickly get complicated. So, what seems to be the problem? Doesn't it boil down to members electing a Council and charging them with the job of administering the Act on behalf of those members? Well, yes, but ...

The business of "governing" the professions turns out to involve not

only our members, but groups beyond engineering and geoscience, from jurisdictions both in and out of the province. We have Memoranda of Agreement with other provincial professional groups in order to smooth working relations. On the national scene we have inter-provincial mobility agreements, CCPE, CCPG, CEAB, CEQB, and a myriad of other professional and sectorial bodies that expect our input. At times, it seems that issues relating to other organizations and other provinces outnumber the issues that relate to the reasons for our legislated existence.

With both internal and external issues to deal with, Council meetings often have up to 20 agenda items, each supported by half a dozen pages of specific information (well referenced for those who wish more detail). Council meetings can last for four or five hours. Preparation for Council meetings can take twice that long. And all of this is being done by volunteers who have "real" jobs to tend to.

The need to make procedural changes that will allow Councillors to look at the forest rather than the trees is very apparent. So, mixed in with the usual number of detail agenda items, Council has begun to take steps to improve the governance process. As of the May Council meeting, we initiated a restructuring of our processes under what has become known as the "Carver Model". This model divides administrative responsibility between the Council and the Council's "only employee", the Executive Director. It then provides a set of guidelines under which these responsibilities can be carried out.

Simply put, the Council is responsible for linkages with the "ownership", creation of written governance policies, and assessment of the performance of the Executive Director. The idea is to force Council into a mode of looking at the questions "what difference do we want to make, for whom, and at what cost?" It excludes Council from the all-too-frequent diversion of dealing with administrative detail. Clearly, it is an attempt to get away from a personification of the observation that a camel is a race horse developed by a Committee.

So, under the Carver model, Council will focus on the "big picture" as defined by the membership and the various other groups that expect responses from APEGM. Avenues of communication will be less restricted by the "administrivia"

that has plagued Councils in the past. We will have to tell our "employee" what we want done. These instructions will come as policy statements and defined "ends", or measurable goals. If Council does its job, then the "administration" should be able to proceed with less interference and more effectiveness.

While the model suggests that the Executive Director is the only "employee" of the Council, day-to-day operation of the Association requires the existence of a full-time staff. This staff is directly responsible to the Executive Director, Dave Ennis - not to Council. Council tells the Executive Director what it wants done, and then gets out of the way so the request can be met.

APEGM always has been, and will continue to be, an organization of volunteers. We are fortunate to have a dedicated group of persons who respond to enquiries and work through the endless details that sur-

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Manitoba Engineer is First Canadian to Win Coveted Quality Medal

Dr. Madhav Sinha, a professional engineer with the Manitoba Labour Department, has become the first ever Canadian to win the highest medal of honour from the American Society for Quality (ASQ), the 1998 Edwards Medal, normally won by Japanese, Americans, or Europeans. Considered as the "Oscar" award in the field of quality control and total quality management (TQM), it is given for pioneering contributions by individuals in the development and application of quality management methods. He was cited "for his contributions to build the foundation and practice of total quality through organizations and establishment of education systems, quality award programs, quality management standards, community quality councils,

and for professionalism in teaching, publishing and administering government service excellence programs." Dr. Sinha's high level of achievement was recognized by the Labour Minister, the Honourable Mike Radcliffe, Q.C., who announced the award before the Manitoba Legislature.

Dr. Sinha gave his medal-acceptance speech on the topic of leadership requirements for advancing quality in the 21st Century to the ASQ Annual Quality Congress which was attended by over 4,000 quality professionals from over 45 nations. "Just like quality is not any more about products and services, but about organizations," he said, "leadership is also not about one or two individuals at the top echelon, but about hidden leaders in the mid-

dle and the front lines. The job of top management and CEOs is to find, develop and grow more leaders from inside the organizations." ■



Dr. Madhav Sinha

Deadline Approaching For Next National Professional Practice Examination

Next Session:
October 18, 1999

Deadline for Application (to APEGGA):
September 1, 1999

Following Session:
April 17, 2000

Deadline for Application (to APEGGA):
March 1, 2000

Note: to be eligible for registration as a Professional Geoscientist under the Grand-parenting Criteria, the examination must be written at one of these sessions.

Application Forms available at www.apegm.mb.ca or from the APEGM office (ph. 474-2736). ■



CCPE President's Message

Dan Levert, P.Eng., L.L.B.

Mobility Agreement is a Milestone

When CCPE's 12 constituent members signed the Inter-Association Agreement on Mobility of Professional Engineers Within Canada, our profession achieved a significant milestone. The agreement, one of the first of its kind to be implemented by a profession in Canada, eliminates virtually all regulatory barriers to the free movement of registered professional engineers between provinces and territories. It is no longer necessary for engineers to be registered for five consecutive years in one jurisdiction before they can relocate to a new jurisdiction and obtain a full licence, or be fully licensed in multiple jurisdictions. As long as engineers are members in good standing of the regulatory engineering association of the province or territory where they live, they can obtain a full licence in another jurisdiction.

To an outsider, the elimination of a five-year residency requirement may not seem like a big deal. From the perspective of the Associations and CCPE, however, the Inter-

Association Agreement on Mobility of Professional Engineers in Canada is very significant. The agreement will make it much easier for young engineers to move between jurisdictions and maintain full licensure. This should promote increased registration by young engineers, as well as help them to advance in their careers.

The agreement also reflects a key goal of the profession's accreditation system, whereby graduates of an accredited engineering program may apply for registration and licensure in the province or territory of their choice, regardless of where they completed their undergraduate degree. Essentially, graduates of accredited engineering programs are considered by our 12 provincial and territorial regulatory Associations to have met the academic requirements for entry into the profession.

With the signing of the Inter-Association Agreement on Mobility of Professional Engineers Within Canada, the Associations took this principle one step further. Engineers

who have been accepted for registration in one jurisdiction will be considered to have met the academic, experience, and examination requirements for registration in the jurisdiction or jurisdictions of their choice.

Our profession has long recognized the desirability of improved inter-Association mobility for engineers relocating to a new jurisdiction as well as for non-resident engineers. By streamlining the registration process, the agreement enhances mobility for Canada's engineers. This will help the profession to regulate multi-jurisdictional projects, regulate foreign engineers undertaking engineering projects within Canada, and fulfill our statutory obligations to protect the public.

CCPE is very proud of the coordinating and facilitating role we played in bringing about the Inter-Association Agreement on Mobility of Professional Engineers Within Canada. The agreement is the culmination of the effort that went into the development of our national guideline on "Admission to the Practice of Engineering in Canada." It is in keeping with our role as the

national organization of the profession's 12 regulatory Associations, as well as an example of the cooperation and trust that exists between the Associations.

Like the accreditation system, the Inter-Association Agreement on Mobility of Professional Engineers Within Canada does not supersede or override the mandate of the profession's regulatory Associations to review the qualifications of all applicants for registration and licensure within their respective jurisdictions. In exceptional circumstances, applicants may be required to demonstrate their qualifications through examination or the submission of supporting documents, and all applicants must agree to abide by the continuing competency requirements in force in the jurisdiction once they become registered. However, the agreement firmly establishes the principle of mobility within our profession, and sets an example for other professions in Canada to follow.

The Inter-Association Agreement on Mobility of Professional Engineers Within Canada is truly a milestone for the engineering profession in Canada. ■

Correction to the Great Northern Concrete Toboggan Race Article

By: J. Blatz, EIT

The GNCTR team would like to extend their sincerest apologies to Lafarge Construction Materials for missing them on the list of sponsors. Although all the sponsors' contributions were important in ensuring the team's participation this past year, Lafarge played a paramount role for the team by making both a financial contribution as well as working with the team to design and build the concrete base for the sled.

The team tried a new concrete mix design using lightweight aggregates. Two Lafarge employees, Heidi Bredenholler, EIT, and Joel Malkoske, EIT, helped the team

choose a mix design using Lafarge cement, Master Builder's admixtures, and the lightweight aggregates selected by the team. The concrete was mixed and poured in the Lafarge quality-control lab. During concrete placement, quality-control testing was performed and cylinders were taken by the Lafarge staff. The slab was kept in the quality-control-lab steam room for the initial curing period. All test results were provided to the team for their GNCTR Report on concrete-mix design. As mentioned in the previous article, the design worked very well, earning third place in the overall mix design competition. ■

Canadian Science and Engineering Hall of Fame Seeking Nominations

The National Museum of Science and Technology is seeking nominations to the Canadian Science and Engineering Hall of Fame, which was established by the National Research Council of Canada in 1991 to honour scientists, medical researchers and engineers who have made a very significant contribution to their discipline and to Canadian society. To date, 22 individuals have been inducted into the Hall, the last two being Nobel Prize Winners Dr. Bertram Brockhouse (physicist) and Dr. Michael Smith (Chemist).

Nominees must have contributed in an exceptional way to the advancement of science and engineering in Canada; their work must have brought great benefit to society and their communities as a whole; and they must possess leadership qualities

that can serve as an inspiration to young Canadians to pursue careers in science, engineering or technology.

Nominations must be submitted prior to September 15, 1999, and should be sent to Claude Faubert, Secretary, Selection Committee, Canadian Science and Engineering Hall of Fame, P.O. Box 9724, Terminal T, National Museum of Science and Technology, Ottawa, Ontario K1G 5A3, or by e-mail to: cfaubert@nmstc.ca. Supporting evidence, such as a description (500 words max.), which may be supported by documents, etc., is required.

More information on nominations is available at: www.nmstc.ca (search for Hall of Fame); and on the Hall, at www/corpserv.nrc.ca/corpserv/hall/u_main_e.html. ■

Self-Governance at Risk?

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governance be seriously undermined? While we await the court's ruling and its implications, four of our members were keen to express their views in the following ways:

Dear Sirs,

I read with interest the June Issue of *The Keystone Professional*, and the various articles about the case involving Memorial University and the Association of Professional Engineers and Geoscientists of Newfoundland. A number of points deserve further discussion.

It appears to me that the judge at the Supreme Court of Newfoundland did not address the issue of the name of the program in "Software Engineering" at all, or the use of the title "Engineer". That case is clearly still pending. What the judge did review, and clearly repudiated, were the actions of the APEGN to withdraw the accreditation of the MUN Faculty of Engineering when there was clearly no academic basis for doing so. The accreditation was clearly withdrawn as punishment for the actions of the Department of Computer Science, and an attempt to bypass the pending court action. This is clearly an abuse of the authority granted to the APEGN to monitor the academic qualifications of graduating engineers. The court has said that this authority must be used to ensure that academic standards are monitored and maintained, and not to be used as some sort of

"hammer" to be held over a University at the pleasure of the Association. This seems to me to be a just and fair decision. Would the association consider it just to remove the licences of all Professional Engineers employed by Novell in Canada, because the company issues certification to "Network Engineers"? That would be ridiculous, but it is essentially what APEGN did. It seems to me that actions like this are a serious threat to our right to self-governance. It suggests to the public that we do not take our role in the accreditation process seriously, and will use the accreditation as a reward or punishment, irrespective of the academic quality of a university program and its graduates.

Secondly, I fail to see the justification for the time, energy and money that is put into the pursuit of the perfect use of the word "Engineer". It is most often put forward as an issue of public safety and public confusion. Why do you feel that it is best to control this word, Engineer, rather than raise the awareness of the title Professional Engineer, and the designation P.Eng.? We should look at the experience of other professions and titles for some guidance and understanding. In the case of accountants, there are at least three designations, Chartered Accountant, C.A.; Certified Management Accountant, C.M.A.; and Certified General Accountant, C.G.A. Is there a crisis in the finance and accounting profession because there are three different groups using the title of accountant? I've never seen that in my business experience. People

who are involved in or concerned about accounting know what the qualifications and experience of the various designations are. If they don't know, they can consult the appropriate organizations, all of whom have a fairly high public profile, through various media advertising. Another case to look at is the use of the title "Dr." In our society a wide variety of people are allowed to use the title of Dr.; physicians, surgeons, dentists, veterinarians, chiropractors, and Ph.D.s. Is there a huge problem here? Are the general public rushing to people with a Ph.D. in art history for neurosurgery or seeing their chiropractors to get braces? Clearly not. The public has learned how to make these distinctions. Finally, even in the pursuit of the control over the word engineer, we have already allowed people who operate trains and boilers to share the title with us. Does the public call CN when they want to build a bridge or a nuclear power plant? Again, clearly not.

I strongly believe that the CCPE, APEGM, APEGN, and other associations should aggressively protect the titles of Professional Engineer, and P.Eng, and make a serious effort to educate the public about the skills and qualifications that we as a group possess. I also strongly believe that this pursuit of the control over the words engineer and engineering, is not appropriate, and there is a risk that we are making ourselves look silly in the eyes of the public. The general public doesn't really understand why we are so against Software Engineers but don't object to Power Engineers. I really believe

that we should focus on the title P.Eng., and spend our energy letting the public know how to recognize us and our important contribution to society.

Regards,

C.M. Parker. P.Eng.

The June 1999 issue of *The Keystone Professional* contains a message from the President of the CCPE, Mr. Dan Levert, P.Eng. He discusses the CCPE, APEGN and Memorial University of Newfoundland dispute over the university's use of the term "software engineering."

Mr. Levert urges all engineers to "stand firmly behind APEGN in this fight." I'm afraid that I simply cannot condone the actions of a professional engineering association that operates in the manner that APEGN has. According to Mr. Levert's article, The Faculty of Engineering at Memorial University of Newfoundland sided with the APEGN in requesting that the name of the software engineering program be changed. However, APEGN subsequently attempted to blackmail the university by threatening to withdraw the accreditation for the Faculty of Engineering's programs. I do not see how this behaviour can be considered to fall within the limits of the Engineering Code of Ethics, unless APEGN's version differs significantly from Manitoba's. How does the computer science department's use of the term "software engineer" make the Faculty of Engineering's engineering programs

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Meet Your New Councillor – John MacLeod, P. Eng.

By: V.L. Dutton, P. Eng. (Ret.)

How could an interviewer from Birtle fail to be impressed when he learnt that the man he was interviewing not only knew Birtle, but has ridden through it on a snowmobile? John and his family do a lot of snowmobiling around Flin Flon and, while John is a Rotarian, in January he participates in the Lion's Journey for Sight. It turns out that this is an annual ride from Flin Flon to Brandon via Birtle. This past January the riders raised \$75,000 for their charity.

John and Mrs. MacLeod are Haligonians, but I assume that their two children are Manitobans. Max

(10), is in Grade 4 and Mya (7), is in Grade 2. This long-time Scouter was delighted to learn that both children are in Wolf Cubs.

John studied at St. Mary's University for three years which earned him a Diploma in Engineering. He then did a further two years at TUNS (Technical University of Nova Scotia, but now called Dal Tech) which gave him his Bachelor's Degree in Civil Engineering. He graduated in 1981 and immediately began work with HBM&S at Flin Flon. He mentioned plant modifications and work on expansions. John must have done them well as

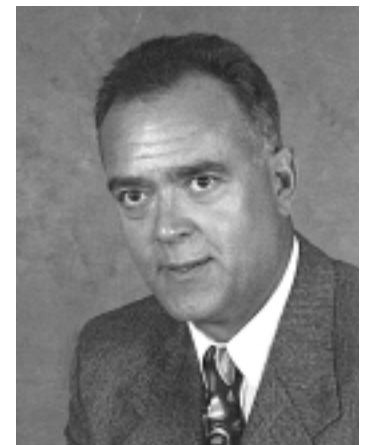
he is now the Supervisor of Plant Engineering.

John joined the APEM in 1984.

In 1992, Pat Feschuk, then the Association's President, visited Flin Flon. This led to John organizing the local chapter of our Association. Engineers and Geoscientists from Flin Flon, Creighton, Snow Lake, Thompson, and The Pas do a considerable amount of travelling to attend a Chapter meeting! Don Harfield, in The Pas, is the current Chair.

Incidentally, it would appear that this is the only Chapter in Canada where members from two provinces meet together.

When Doug Kramble left Manitoba, Council asked John to complete Doug's term. John was then elected to Council last November, and he also serves on the Legislation



Councillor John MacLeod, P. Eng.

Committee. John is looking forward to working with Council on the new governance policy, of which we will learn more in this and future issues of *The Keystone Professional*. ■

1999 APEGM Spring Golf Tournament

By: M. Baril, P.Eng.

The 1999 Spring tournament, the inaugural tournament for APEGM, was once again held at Quarry Oaks. As has been the trend of the past few years, the tournament filled up quickly, with 148 golfers participating. We were given the opportunity to redeem ourselves for last year by again challenging the Desert and Quarry nines. This year's weather co-operated with a mixture of sun and cloud, but no rain. APEGM President Ron Britton was present to award the trophies to the first- and second-place teams, as well as give the President's Address. The serious business of eating and the awarding of prizes followed the address.

The winning team of Dave Krahn, Carl Wiebe, Lance Vigfusson, and Dwight Gibson had three members from last year's first place team. They once again finished with a round of ten under par (-10). As far as we know, all scorecards from the previous year had been destroyed. Second place, with

a score of 9 under par (-9), went to the team of Rob McBain, Brad McCormac, Mike Grimes, and Charles Evancio.

Once again, the tournament was a well attended, fun-filled afternoon and evening of golf, food, drink, and social networking, not necessarily in

that order. The Spring tournament is the "gem" of the Sports Committee; however, there are upcoming events that are not to be missed. The Fall Golf Tournament is being held on September 16, 1999, at Lartars at St. Andrews (see insert). In addition, keep your eyes open for the Curling Bonspiel coming later this year. ■



President Ron Britton presents trophy to the winning team.

Advertising in The Keystone Professional

By: J.W. Bogan, P.Eng.

The Communications Committee has considered including advertising in the Manitoba Professional Engineer for many years. The Manitoba publication was the only one in Canada which did not include advertising. Requests to include advertising were often submitted to the Association and the Committee for review. Until now, the policy has been that advertising was not accepted. Arguments were always considered that advertising could be used to offset some portion of the production costs.

After much discussion, the Communications Committee recommended that advertising be considered within *The Keystone Professional*. A presentation was made to Council and it was accepted.

With this approved, the Communications Committee has developed guidelines for paid advertising in the publication. These guidelines are new, and will be reviewed and refined as we gain experience with the process.

Advertising will generally be limited to products and services of technical or professional interest to members of the Association. They are expected to include:

- Engineering, geological, or geophysical services
- Educational products and services supporting continuing professional education and development
- Financial and insurance services endorsed by CCPE
- Financial services and retirement planning
- Legal and contractual advisory services
- Business-and personnel-management services
- Employment opportunities
- Professional-appointment notices

These guidelines are similar to those used by other Associations in Canada.

The Association reserves the right to refuse any advertisement. It is expected that the Communications Committee will assign the duty of responding to queries from potential advertisers to one individual

from the committee until the volume of work can be established. It is not intended that an Association staff-position will be required. The amount of advertising will be limited to a maximum of 25% of the publication. Submission dates for advertising will correspond to the dates already used for publication. It is expected that advertisements be provided camera-ready.

The production process for *The Keystone Professional* is not expected to change as a result of including advertising.

Rates will initially be set as follows:

Single Page	\$ 1,000
Outside Back	\$ 1,500
Inside Back	\$ 1,250
1/2 Page	\$ 500
1/4 Page	\$ 250
Business Card	\$ 100

Please note, these rates are subject to review and may change. The publication is produced using a three-colour process. It is recommended that advertisements be black and white. Otherwise, only the colour selected that month for publication will be available. ■

President's Message

Continued from page 3

round almost everything we do. But much of the "real" work associated with APEGM is done by members who serve on committees. Many of these committees perform well-defined functions, like Academic Review for example, that are fundamental to the orderly operation of APEGM. Council will define the Policies under which committees will function, and they will now report to Council through the Executive Director.

If we haven't learned anything else over the past couple of years, we have learned that there is a crying need to improve communication between APEGM members and Council. The changes in process that we are now undertaking is a response to this need. By freeing Council to work on direction rather than detail, Councillors should be better able to hear and reflect members' concerns. And our staff, including the volunteers on the working committees, should be able to get on with their respective jobs without undue interference. We will soon begin to see whether this change is an improvement, or just a change. ■

Exceptional Pre-Graduation Work Experience Now Eligible for Consideration

By: S. M. Matile, P. Eng.

This Association now has in place a policy for accepting and evaluating Pre-Graduation Work Experience.

EITs/GITs should understand that the intent of this policy is to recognize the significant work experience obtained by students in certain co-op and internship programs prior to their graduation from university. It is not intended to include normal summer employment, and will not include all co-op assignments or internship positions.

If you believe that you obtained significant engineering-level work experience that meets the definition of Acceptable Engineering Work Experience prior to graduation; if that experience was obtained under the supervision of a registered professional member who is prepared to vouch for that experience and take professional responsibility for it; and if this Association's Experience Review Committee has already approved at least 12 months of your post-graduation work experience, the following policy and evaluation guideline may apply to you.

Council Policy Regarding Pre-Graduation Work Experience

APEGM will accept pre-academic-qualification work experience which meets the definition of acceptable

engineering work experience or acceptable geoscientific work experience and is supervised by a registered professional member who takes responsibility for the work, as follows:

- for university students: work experience obtained following the completion of one-half of the university program, on work terms of minimum three consecutive months duration, to a maximum of twelve months
- For former technologists: normally, to a maximum of twelve months, but with the potential, in exceptional circumstances, and based upon an exhaustive interview, for a maximum of 24 months
- For confirmatory examination candidates: to a maximum of twelve months
- For proficiency examination candidates: to a maximum of twelve months.

EIT/GIT Pre-Graduation Work Experience Evaluation Guidelines

1. Pre-graduation work experience must meet the Association's definition of acceptable engineering work experience or acceptable geoscientific work experience and must have been supervised by a registered professional

member, or equivalent, who takes responsibility for the work.

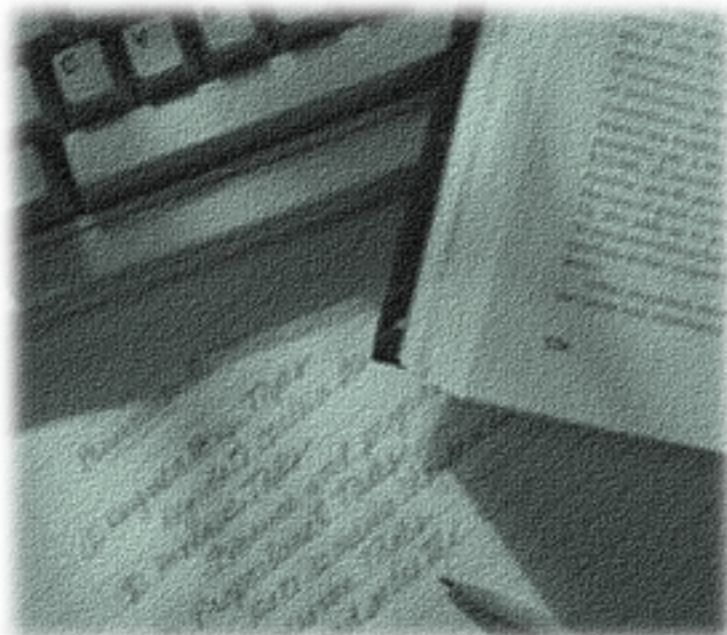
At an absolute minimum, the EIT's/GIT's pre-graduation work experience must have included the application of theory and the EIT/GIT must list the subject areas of his or her academic background in which the experience was obtained.

2. The applicant must be enrolled with APEGM as an EIT/GIT before the pre-graduation work experience will be reviewed.
3. Normally, the pre-graduation work experience must have been obtained no earlier than the completion of one-half of the academic qualification requirements.
4. Normally, pre-graduation work experience will be accepted only when obtained during a period of:
 - (a) not less than three consecutive months as part of a structured program, such as a co-op or internship program; or
 - (b) not less than three consecutive months as summer employment that subsequently leads to a longer-term position with the same, or a similar organization; or
 - (c) not less than six consecutive months as work experience in any other work environment.
5. In order to be considered, normally the pre-graduation work experience must have been obtained during the four years (48 months) prior to enrollment as an EIT/GIT with APEGM.
6. Pre-graduation work experience must be reported and attested to by a qualified professional practitioner in the same manner as applies to post-graduation work experience (i.e. using the APEGM EIT/GIT Progress Report forms).
7. In order to be considered, the pre-graduation work experience report(s) must be submitted by the EIT/GIT in the form referred to in item 6 above, within 12 months of the date of the letter of notification to the EIT/GIT advising him/her that he/she has successfully completed 12 months of acceptable post-graduate work experience, and indicating the parameters within which pre-graduation work experience will be considered.
8. Pre-graduation work experience will be considered in a similar manner and to a similar standard as would be applied to work experience obtained after graduation.
9. Normally, up to a maximum of twelve months' pre-graduation work experience will be accepted, with an absolute maximum of 24 months being accepted for applicants such as those who formerly were technologists.
10. No professional development hours or professional service points will be required to have been earned during the period of acceptable pre-graduation work experience. However, the total Pre-Registration Program requirements must be met.
11. An administration fee, in an amount to be set annually, will be charged. If any portion of the pre-graduation work experience is acceptable to the Experience Review Committee, half the administration fee will be refunded. The administration fee for 1999 is \$100.00 on which \$7.00 G.S.T. is applicable.

If you believe that any of your past work experience will qualify, please complete an Application for Evaluation of Pre-Graduation Work Experience for that experience and submit it to the APEGM office with payment of \$107.00. (The application form is available either from the office or at our website.) ■

Engineers in The News

The Winnipeg Library Board has appointed **V.L. Dutton, P.Eng. (Ret.)** to the Citizens' Committee for the Libraries in St. Vital, Windsor Park, and St. Boniface. ■



Council Reports

Tuesday, May 11, 1999

By: B. Stimpson, P.Eng.

AT WHICH THE CARVER MODEL FOR POLICY GOVERNANCE OF APEGM MOVES CLOSER TO REALITY

With only one member absent, the May Council meeting was one of the best attended for some time and also one of the shortest. With only a brief break for photo-taking and other necessities, Council conducted its business in a very efficient manner between 12.30 p.m. and 2.45 p.m.

Two issues brought before Council involved, directly or indirectly, the practice and definition of engineering. First, readers of this publication will be aware of the legal challenge now underway in Newfoundland over the use of the term "software engineering". Owing to the importance of this matter to the profession throughout Canada, APEGM deemed it important to be proactive with respect to its jurisdiction in Manitoba. Consequently, a delegation from APEGM, including President Ron Britton, had held an information meeting with the Ministers of Labour and Education.

On another front, it was highly disappointing to learn from President Britton that, despite a meeting with the MAA on May 5th, the Manitoba Association of Architects does not wish to renew the Memorandum of Agreement with APEGM when it expires at the end of June. The two Presidents have agreed to meet again in an effort to find some resolution, otherwise the relationship between MAA and APEGM will be back to "where we were three years ago."

On budgetary matters, Council learned that the anticipated surplus for the year-end July 31 is \$24,000. However, this figure is projected on the basis of revenue that includes \$75,000 carried over from the previous fiscal year and therefore points to a tightening of resources.

Tuesday, June 8, 1999

By: A.N. Kempan, P.Eng. (Ret.)

WHERE COUNCIL PONDERES THE MEANING OF "ENGINEER"

In the days preceding Council meetings, Councillors receive a sheaf of briefing papers to prepare them for the meeting. The April meeting notes were agreeably thin, a portent for a short meeting. This has been the trend in recent months – perhaps due to the efficiency of our Councillors?

Present for this meeting were President Britton, Executive Director Ennis, Councillors Ferchoff, MacLeod, Matthews, Roberts, Ball, Eddy, and Director of Admissions Shirley Matile, who was pressed into service as minute-keeper for this meeting.

After a series of brief Council meetings, this one reverted to a more normal five-hour session.

President Britton started with a basic question when he asked Councillors for their input on what the term "engineer" meant to them. This was prompted by the reaction to his piece in the publication regarding the situation with the Memorial University of Newfoundland and the dispute over the term "software engineering." President Britton had received letters which ran 3-1 against the position taken by APEGM. Most writers felt the term "engineer" was generic and it was a quixotic enterprise for the profession to try to protect it. Councillor Eschenwecker recounted an informal discussion with fellow engineers at Standard Aero who likewise thought that only "professional engineer" should be protected. Councillor Roberts said that she personally agreed with protecting "engineer," but APEGM should concentrate on protecting "professional engineer." President Britton agreed that some people's reaction is that the battle over "engineer" is lost and that we should just concentrate on "professional engineer." However, President Britton still wanted more feedback from members in general.

Next, Mr. Ennis presented the Report of the Executive Director. One item dealt with a request for funding from the Engineering Access Program

Councillor Carol Roberts reported that the final analysis of data from a Manitoba Engineering Graduate telephone survey will be completed shortly.

Councillor Ralph Eschenwecker reported on progress with the Professional Development Review Task Force. Alternatives have been developed and plans for a questionnaire to members about these alternatives are underway.

Started in 1986, the Engineering Access Program (ENGAP) at the University of Manitoba was the first program of its type in North America and was designed to increase Aboriginal student enrolment in Engineering. There are currently 40 students in the Program. Council discussed a request from ENGAP Director Randy Herrmann, P.Eng., for a contribution from APEGM towards ENGAP's Scholarship and Bursary Fund. Council approved an amount of \$1,000 for this year to provide support for one student, with the funding to be considered on a year-by-year basis. Councillor Sami Rizkalla emphasized that the inclusion of Aboriginals in the engineering profession is a matter of great importance to Canada (Note: to Council's knowledge there is no program equivalent to ENGAP for geoscientists).

Council took a significant step by passing a motion to begin a process to implement a system of governance and management of the affairs of APEGM based on the Policy Governance Model. The Carver Model, as it is called, is designed to create a more efficient operation in which Council works on direction (governance) through one employee, Executive Director and Registrar, Dave Ennis, who is then empowered to implement policy. Concurrently, monitoring of operations takes place to ensure that policies are being implemented properly and on schedule. There is much more to the Carver Model than this brief description can convey. No doubt, future issues of this publication will provide further information. President Ron Britton asked Council to give him and Vice-President John Hosang time to develop steps and a schedule for moving to this new model of policy governance.

CCPE Director Doug Chapman also reported on the movement towards implementation of the Carver Model of Policy Governance in CCPE. CCPE had recently met with John Carver himself over a period of two days. According to Carver, the model (which is trademarked) has been successful wherever it has been fully implemented and practised. ■

(ENGAP), which promotes the study of engineering by aboriginal students. Council passed a motion at the May meeting providing a \$1,000 scholarship for ENGAP. APEGM had earmarked funds for this purpose some years ago. President Britton said that ENGAP students' success was improving, but lagging the general population. He attributed this to the lack of uniformity in educational background. He said that ENGAP was very good at providing support for aboriginal students on campus.

It seems that APEGM can never quite escape the grips of the legal process. This time it is a spot of trouble with a Winnipeg home-inspection company. Executive Director Ennis wrote a letter some time ago stating that the principals of the said home-inspection company were not professional engineers. They have taken exception to this, even though Mr. Ennis's statement is factually correct, and are prepared to sue Mr. Ennis, the Association, and an associated real-estate company. APEGM has two insurance policies to cover such situations, and between them the insurers must decide who will defend the suit.

Just as legal issues never fade away, neither does the saga of the APEGM and the Manitoba Association of Architects. The APEGM's Joint Board representatives had drafted a position statement on behalf of APEGM regarding the public's freedom to choose the profession they wanted to oversee their building projects. As the By-Law reads now, one may choose an architect or an engineer, or both. Council read and discussed the position statement drafted by the Joint Board representatives and it quickly became evident that many Councillors were very uneasy with the tone of the document, which was seen as being unnecessarily combative. Council was in a conflict – they could ask the committee to rewrite the position statement and offend the committee – or send it along and offend the Manitoba Association of Architects. In the end Council felt they couldn't, in good conscience, forward the document without first reviewing it with the Joint Board representatives. A motion to this effect was passed.

The subject of increased membership fees was floated before Council. This was discussed at the May meeting, but no further action was taken then

Continued on page 9

Dean Donald H. Shields Retires

By Dr. R. Kenyon, P.Eng. and J. Blatz, EIT

Dr. Donald H. Shields retired as Dean of the University of Manitoba Faculty of Engineering July 1, 1999, concluding a formal career spanning some 44 years of consulting, research, teaching and academic administration. The career included substantial contributions to the Canadian Geotechnical Society at a critical time in its history. Dr. Shields' career and contributions were remembered and celebrated by the geotechnical engineering community on two occasions this past spring.

Colleagues and graduate students of Donald Shields gathered in Winnipeg on the weekend of April 16 and 17 to visit, to reminisce, and to honour the man with whom they had studied, practised and researched. Colleagues attending included Ken Peaker, Jack Clark, Don Scott, Gunther Bauer and James Graham. Former graduate students in attendance were Rob Kenyon, Walter Kwan, Neil Chandler, Clark Hryhoruk, Kimber Osioy and Robert Kwok. Greetings from around the world were sent by those unable to attend.

The highlight of the weekend was a reception and evening of "tall tales" at the St. Charles Country Club. Ken Peaker, colleague at Trow Soderman, (later Trow and Associates) and fellow graduate student (University of Manchester 1960-63), recounted their days in Manchester with stories of having to enter their office through the men's washroom, of chasing globs of mercury around the lab floor and of having to use rusty old fire extin-



Dr. Shields shares a laugh with long-time friend and colleague Ken Peaker.

guishers for air-water pressure cells. Recent graduate students noted that things were relatively unchanged 44 years later! Speaker after speaker continued along similar themes. Colleagues remembered his humour at work and his ability to push them higher in their own careers. Graduate students shared their stories of research and paid tribute. The words mentor, colleague and friend were heard frequently and repeatedly.

On May 6th, Dr. Shields addressed the Manitoba Branch of the Canadian Geotechnical Society at its annual Spring Windup. Dr. Shields spoke about the need for role models and mentorship by

recounting those individuals who had been critical to his development as a young engineer. They were, and are, giants of the geotechnical community. The list included Ben Torchinski, Bill Trow, Hugh Golder, as well as the colleagues who had been in attendance the first weekend.

The profound impact that Dr. Shields had within the geotechnical community was abundantly clear on both occasions. We, in the geotechnical engineering community, congratulate Dr. Donald Shields for a career well done. We thank both him and Carol for being part of our professional and personal lives and wish them well. ■

June Council Meeting

Continued from page 8

or at this meeting. Council decided to postpone a decision until the July Council meeting. Councillors were apprehensive over the reaction from the membership should the increase become real.

APEGM's CCPE director, Dr. Doug Chapman, had expressed a desire to leave his position. Past-President Washchyshyn was recommended as a replacement, and has agreed. Dr. Chapman will leave after the November meeting.

Councillor Eschenwecker, leader of the Competence Task Force, aka Professional Development, had encountered a speedbump on the road of life. After several meetings of the Task Force, and after some encouraging progress, several members of the Task Force had begun to question the necessity for any kind of action on professional development. The surprising thing was that the members voicing this opinion were "moderates," ones who were not associated with the strong dissent evident after the mail-in vote. Councillor Eschenwecker said if the Task Force members couldn't stand

behind a recommendation, how could he present it to the membership? Councillor Eschenwecker felt that members would accept a requirement for professional development if it could be demonstrated that the "customers" of engineering services expected members to be qualified and competent.

President Britton stated that there should be a task force to examine the expectations of the consumers of engineering services, and that the examination should be without bias. He said that although this turn of events was frustrating for those involved, it was a necessary

APEGM VISION

APEGM is the leader and a facilitator of the process that ensures excellence in engineering, geoscience and applied technology for the public of Manitoba.



Pre-stressed Concrete – The Origin

By: V.L. Dutton, P.Eng. (Ret.)

In the 1920s, following the Great War, The French engineer Eugene Freyssinet began to use reinforced concrete for the construction of hangars. With the development of the dirigible for rapid long-distance travel, hangars having arched roofs with radii of 25 metres were in demand. It was in 1928 that Freyssinet took out the world's first patent for pre-stressed concrete. ■

exercise. No definitive action was called for by Council, other than that the Committee should continue its work.

Executive Director Ennis called attention to an item indirectly related to the implementation of a professional competence program. Originally it was planned that membership bills would coincide with professional development reports and that they would be spread throughout the year. If professional development did not proceed, should APEGM continue with staggered billing, Mr. Ennis asked. Council said yes. ■

University News



By: B. Stimpson, P.Eng.

Department of Biosystems Engineering

Dr. D. Jayas, P.Eng., Department Head, has been elected as President of the Canadian Institute of Food Science and Technology (CIFST). CIFST is a 1500-member organization of professionals from industry (70%), universities (15%), and government (15%). The organization's mandate is to promote research and development in food sciences and engineering.

Department of Electrical and Computer Engineering

Dr. I.R. Ciric received an invitation to give a presentation on "Light Scattering by Nonspherical Particles" at NASA's Goddard Institute for Space Studies, New

York. He has also been invited to write a chapter in a book sponsored by NASA reviewing the analysis of associated mathematical models.

Graduate student A. Tregobov is the recipient of a Winnipeg Chamber of Commerce Technology Award under the category of "student innovation."

Department of Civil and Geological Engineering

The Department welcomed a new staff member, R. Hutchinson, P.Eng., to its professorial ranks. As an Assistant Professor, she will be teaching in the structural area and carrying out research on the application of composite materials in structural engineering.

C. Flather, graduate student and Senior Coordinator of the Univer-

sity's ACCESS Program for Women in Science and Engineering (WISE), is the recipient of the 1999 Engineering Students Project Award.

CFI - A Clarification

In the June issue of *The Keystone Professional* I reported that the University of Manitoba had achieved a 100 per cent success rate in the latest Canada Foundation for Innovation Grant Competition and added a specific reference to Dr. D. Jayas's (Department of Biosystems Engineering) and his team's award of \$1,524,900. The "latest" in this case refers only to those applications that passed the first round and were forwarded to the second stage. Thus, there was 100% success at the second stage, but not at the first stage of the competition. ■

Research News at the U of M

By: D.S. Jayas, P.Eng.

Container For Distribution of Retail-Ready Fresh Meat

Research Team

Digvir Jayas, P.Eng., along with meat scientists Rick Holley of the Department of Food Science at the University of Manitoba, Les Jeremiah and Colin Gill (both of Agriculture and Agri-Food Canada Research Centre in Lacombe, Alberta), and four graduate students (Gaurav Tewari, Jeyankondan Subbiah, Melissa Habok, and Melaine Wasney) are developing a system to revolutionize meat distribution in Canada.

Current Meat Distribution

The term "fresh red meat" is used to refer to chilled beef, lamb, pork, or veal. Current red meat distribution systems require delivery of the live animal to a slaughter house where the animal is processed into primal, sub-primal, and consumer cuts. The primal and sub-primal cuts are large in size (15-50kg), while the consumer cuts are retail-ready. Most meat leaves the packaging plant as either primal or sub-primal cuts requiring further fabrication at the retail outlets. At times, half (sides) or quarter animal carcasses are sent from the slaughter house to the retail

store where they are cut and prepared into retail-ready packs, over-wrapped in polyethylene for display and sale.

Potential Centralized Processing & Distribution

The retail-ready meat cuts will be prepared at a central location by a meat packer using their specialized work crews to reduce cutting waste through additional product diversity and to improve end-product shelf life by minimizing handling of fresh meats. The retail-ready cuts will be distributed to the retailer for sale to the consumer.

Potential Benefits

Efficiency in the meat industry could be increased with the application of centralized processing and packaging of retail-ready meat cuts. Retailers have shown considerable interest in central preparation of retail-ready meat cuts because of the lower in-store labour costs and the ready-to-go convenience of products packaged by the suppliers. Floor space within the marketplace can then be devoted to the merchandising of products, rather than for their fabrication. Consequently, retail stores would realize considerable profit if they were able to obtain chilled meats as retail-ready items. The cost of refrigeration and trans-

portation of meat cuts will be reduced by handling only the portion of carcasses which is usable meat. The waste will be centralized and thus can be disposed of efficiently and economically. The wholesaler of centrally-packaged meat will benefit by better utilization of resources, because of better inventory control and less waste through utilization of fat, bone and trimmings; and by using automated equipment. The consumers will benefit through economic savings passed down to them by the wholesaler and retailer. Consistency and variety of products is another major benefit consumers will receive from centralized processing. Improved efficiencies will increase the competitiveness of Canadian meats in export markets and thus increase returns to Canadian producers, processors and distributors, and will probably create more jobs in Canada.

Container Design & Testing

An insulated container was designed and fitted with an acrylic box such that the box can slide into the container and a jacket of 35mm is formed on all six sides of the container. Both the container and the box can be easily sanitized. A space between the inner acrylic box and the inner surface of the container serves as a jacket surrounding the meat. The acrylic box has a magnetic steel strip on the front edges and the fitted inner acrylic door has magnetic strips. The magnetic strips

Engineers in The News

by: S. M. Matile, P. Eng.

Former APEGM Councillor **Kathy Pratt, P. Eng.** recently received her four-year management and administration certificate from the Canadian Institute of Management – complete with a Bronze Award. Congratulations, Kathy! (No wonder you had to step down as a Councillor!)

Dr. Digvir Jayas, P. Eng. was recently elected President of the Canadian Institute of Food Science and Technology (CIFST). Dr. Jayas is a member of both APEGM's Academic Review and Experience Review Committees (he is the Vice-Chair of the former). His current activities on the national front include serving as Vice-Chair of the Canadian Engineering Qualifications Board, Chair of the NSERC Strategic Panel on Biotechnology, a member of the Rapid Instrumental Objective Testing (ROIT) Committee of the Canadian Grain Commission, and Chair of the Technical Program Committee for the Agri-Food 2000 Conference (being held in Winnipeg). On the international front, he is Vice-President of the Asian Association of Agricultural Engineers, Vice-Chair of the Food and Process Engineering Institute of the American Society of Agricultural Engineers, a member of the international Controlled Atmosphere and Fumigation (CAF) Conference committee, and Vice-President of the Applied Zoologists Association of India. He is also a member of the editorial boards of the International Agricultural Engineering Journal and the Journal of Stored Products Research. In his spare time, Digvir volunteers his time to the community as joint secretary of Manitoba's India-Canada Association (he served as President of this organization a couple of years ago.) And his "real job" is Head of the Bio-Systems Engineering Department at the University of Manitoba. Clearly, this man never sleeps! ■

give a good seal and the door can be easily removed and attached. The acrylic box is provided with 12 levels in which 48 master packs can be placed. The total capacity is 200-250kg of meat based on the type and size of the cut. The duration of the trials was 2-3 days and all tests were done with retail packs of beef and pork. ■

Self-Governance at Risk?

Continued from page 5

less academically sound (i.e. more subject to loss of accreditation)?

I feel that rather than chasing around after those using the term "engineer" (which the Act does not directly prohibit, but rather, the use of "professional engineer") the profession would be better served if professional engineers devoted their time and efforts to increasing the stature of the profession in the eyes of the public. Are we best served by appearing to be petty, small-minded individuals who threaten university programs with loss of accreditation because of the name of another department at the university? Are we not better served by concentrating on communicating the fact that we are professionals...and acting as professionals too?

M.J. Coyne, EIT

I would like to respond to the President's message in the June issue of *The Keystone Professional*.

I would caution that lobbying for the exclusive use of the term Engineer has never been in the best interest of the profession, or of the image that the profession wants to convey to the public. As "engineer" is both a noun and a verb, the term "engineer" is widely used in past and popular vernacular to refer to a wide variety of topics, functions or processes. Who "drives" a train for instance? Arguing, much less suing, for the exclusive use of a term that has always been in widespread use appears exclusionary, cliquish, and out of touch. Is the public confused by the term "doctor" as it appears in Rug Doctor? I think not.

However, the title Professional Engineer, and the abbreviation P.Eng., should be held as sacrosanct, and guarded vigorously by the Association, both for the protection of the public and the profession. Of greater concern should be the value that the Association can imbue to the Professional Engineer title in the public eye. Similarly, should the association be concerned by the use of engineer as it appears in CNE, or MCSE? These are recognized accreditations and the person or firm needing these services will seek them out by name. Let's not forget that it's the public's need for the expertise of the Professional Engineer that gives the power and position that the Association holds. It would be a shame if hubris were

to tarnish the image that the public and the Association holds so high.

J.R. Foord, EIT

The President's message "Is There More Than the Millennium Coming to an End?" calls for input. So I offer mine.

The ethics test asks: "Can someone be given the job title Design Engineer who is not a Professional Engineer?" I, like many others, was informed that I answered this question incorrectly. My error, it seems, was to use the written Act as my reference. Had I consulted with the APEGM, I would have learned that the prevailing opinion is that the terms "Engineer" and "Professional Engineer" are one and the same. We as members, are asked to "read between the lines" to determine this because it is, at best, only implied in the Act.

I'm sorry, but the terms are not equivalent. The act is a legal document

which defines and uses the terms "Professional Engineer" and "Professional Geoscientist". The act gives the Association the right to limit the use of these terms to its members. It does not provide blanket coverage to any and all subsets of the terms. It does not give the Association exclusive rights to the term "Engineer" any more than it does "Professional" or "Scientist".

What should be enforced is the Act, as it is written, and not what the Association would like it to be.

Dan Levert's "What's in a name?" says that "graduates of Memorial's honours in software engineering" program will call themselves "software engineers". The APEGM takes great offence to this. However, they have been lax in monitoring the use of job descriptions by its own members. There is no "Software Engineering" offered at the U of M. Obviously, any engineer performing this function has crossed over from

another discipline. If that discipline is Electrical or Computer, it is generally accepted. However, many are from Mechanical or Civil who have learned to program on the job, some better than others. Are they truly qualified to act as Software Engineers? Can I (Computer), as casually cross over into Industrial, or Manufacturing Engineering? How about a Civil, Mechanical or Structural Engineer? These are job descriptions. What I am is a "Professional Engineer".

Finally, The actions of the APEGM in threatening to revoke the accreditation of the engineering faculty because of a dispute with another faculty is bordering on unethical. They are penalizing that faculty because of the actions of another. The fact that the engineering faculty supported them in their efforts for the last three years makes it that much more objectionable. They turned on their allies.

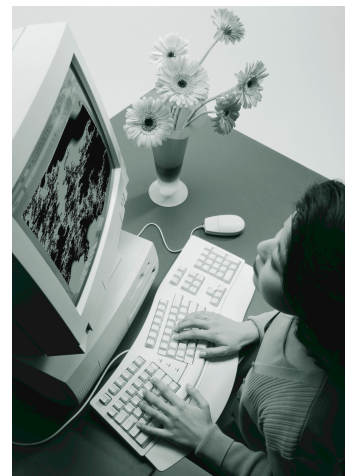
V. Nelson P. Eng. ■

Manitoba: A World Leader in Power-System Simulation

By: J.E. Nordstrom, EIT

Simulation software and hardware have become the power engineer's most important tool for the design, study and analysis of power-system characteristics and behaviours. Power-system transient, or non steady-state, equations require tedious mathematics to calculate, making them impossible to solve efficiently by hand. In a field of engineering where laboratory testing is expensive, test facilities are few, and new systems must function properly before being commissioned, power system simulation software and hardware are a necessity. A good simulation tool in the hands of an experienced power-system engineer is the key to saving the utility (and the consumer) something we can all relate to: Money.

The impending onslaught of deregulation and privatisation in the electric power industry is forcing power utilities to retain a competitive edge in present and future markets. The delivery of quality power, the reduction of "down-time" due to outages, and the cost of power for consumers are all important issues to address in this coming age of power transmission and distribution. Utilities must possess the ability to solve engineering design problems quickly and efficiently to accomplish these goals. The consumer,



both private and corporate, may soon have the option of buying power from any number of suppliers and, as in any marketplace, they will choose the best quality product. Power-system simulation technologies are helping engineers to ensure that their company will remain efficient enough to deliver the best product available at a competitive price.

The Province of Manitoba is an international leader in power-system simulation technology. We harbour an impressive team of research and commercial organisations, including The University of Manitoba's

Electrical and Computer Engineering Department, The Manitoba HVDC Research Centre, RTDS Technologies Inc., and Manitoba Hydro. Engineering tools such as the Real Time Digital Simulator and PSCAD/EMTDC which were developed right here in Manitoba, are being used extensively in many countries throughout the world.

In the early 1970's, Manitoba Hydro embarked on the development of a computer simulation program that could adequately model its Nelson River High Voltage Direct Current (HVDC) transmission system. The EMTDC transients simulation program was a direct result of that effort. During the 1980's and 1990's, the Manitoba HVDC Research Centre developed a graphical interface to provide users with a more user-friendly environment for EMTDC. This interface was named PSCAD.

PSCAD/EMTDC, which stands for (take a deep breath), Power System Computer Aided Design/ Electro-Magnetic Transients Direct Current, is a combination computer software package consisting of a Graphical User Interface (PSCAD) and a FORTRAN-based mathematical engine (EMTDC). PSCAD/EMTDC simulates actual voltage

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NEWS RELEASE

B.C. Engineer Elected CCPE Chair

On June 18, 1999, Richard Hancock, P. Eng., an engineer from Vancouver, British Columbia, was elected Chair of the Canadian Council of Professional Engineers (CCPE).

Mr. Hancock has served on the Council of CCPE since 1993 and on its Executive Committee since 1997. He is currently the Vice-President of Western Operations for Canadian Stebbins Engineering and Manufacturing Co. Ltd., an Ottawa-based company that specializes in the construction, maintenance, and rebuilding of corrosion resistant vessels and structures.

A 1970 graduate of the University of Alberta's engineering faculty, Mr. Hancock is a Past-President, long-time Discipline Committee member, and a Past-Chair of APEGBC's Task Force on Registration of the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC). He is also a Past-Chair of the Canadian Pulp and Paper Association Western Conference;

Also elected to the Executive Committee were Noel Cleland, P. Eng., of Calgary, Alberta (Vice-Chair); Bill Sutherland, P. Eng., of

Halifax, Nova Scotia (Past-Chair); Walter Bilanski, P. Eng., of Guelph, Ontario (member); and Pierre Boucher, ing., of Longueuil, Quebec (member).

The Canadian Council of Professional Engineers (CCPE) is the national organization of the provincial and territorial associations/ordre that govern the profes-

sion of engineering in Canada and license the country's 152,000 engineers. Established in 1936, CCPE serves the associations/ordre, which are its constituent and sole members, through the delivery of national programs which ensure the highest standard of engineering education, professional qualifications and ethical conduct. ■



Richard Hancock, new CCPE Chair of the Council.

Communicating Electronically

Continued from page 2

tronic game involving cooperation as well as competition. Those groups who met for 5-10 minutes prior to the game displayed more co-operation than those who had "met" only electronically before the game. The issue here is one of building trust and a sense of common purpose and these appear to be markedly dependent on direct contact. In a case study of electronic collaboration in the Ford Motor Company, one team "never really became a group" even after one year because communication had been entirely electronic.

Another more subjective issue is whether electronically-mediated research is "good for the soul". For example, one student conducted all his research on the aurora by remotely accessing instruments in Greenland but never directly experi-

enced the phenomenon for himself.

Administrators and technical employees appear to have different preferences when it comes to asynchronous communication, with the former preferring voice-mail and the latter favouring e-mail. The voice is more effective than e-mail in exercising control, while technical data is better conveyed by e-mail.

Networked communications are observed to have benefited those who are "peripheral" members of organizations. Such people, typically lower in the organizational hierarchy, separated geographically from others, perhaps in smaller, specialized groups, and/or mobile, can now keep connected more readily, can communicate with people they might otherwise not have done, and more easily maintain contacts that might otherwise have faded away.

In electronic communication, particularly e-mail, there are few of the social context cues that are evident and important in face-to-face

contacts. As a consequence, people are less socially inhibited, more open, and more likely to take risks or make unconventional decisions. There is also a more equitable participation. On the downside, there is a greater opportunity for conflict and for increasing duration and length of discussions, both of which may lead to a longer time to reach a decision or find a solution.

Electronic communications for group decision-making are not equivalent to face-to-face meetings and need just as much careful organization to work effectively. Above all, in the words of one social scientist, Sara Kiesler, "electronic communication will never automate trust." ■

Sources and more detailed information:

Kiesler, S. (1994). *Working together apart. Cause/Effect*, Vol. 17, No.3.

Ross-Flanigan, N. (1998). *The virtues (and vices) of virtual colleagues. Technology Review*, March/April.

Power System Simulation

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and current waveshapes resulting from a user-specified, electric network of power-system components. The PSCAD/EMTDC library of mathematical models includes a wide range of components from simple passive elements to motors, generators, and complex HVDC converter systems complete with control circuitry. The program is useful for almost any research study or engineering test involving High Voltage transmission applications and systems. PSCAD/EMTDC is still growing and developing at the Manitoba HVDC Research Centre, with the help of the University of Manitoba's Electrical and Computer Engineering Department.

The 1980s also witnessed the birth of another new and exciting technology: Real Time Digital Simulation (RTDS). First developed at the Manitoba HVDC Research Centre, and eventually commercialised and upgraded by RTDS Technologies Inc., the RTDS Simulator is a fully digital power-system simulator with the capability of continuous, real-time operation. In other words, the RTDS Simulator can perform power-system transient calculations at essentially the same speed as they occur! The RTDS Simulator is bundled into modular units called racks, each consisting of a minimum of 36 digital signal processors operating in parallel. The RTDS Simulator enables power system engineers to actually connect physical control schemes and protection equipment to computer-generated models of real power-system devices. In this way, the engineer can test new designs before they are commissioned. RTDS Technologies Inc. continues to advance and maintain this technology and remains at the forefront of Real Time Simulation.

A promising future awaits these Manitoba-grown simulation technologies. With a new version of PSCAD/EMTDC on the market and continued overseas sales of the RTDS, the opportunities are endless. Manitoba Hydro has continued to operate efficiently, provide top-notch service, and has kept the costs of its power to a minimum. If this team of research and commercial organisations continue to work together, the Province of Manitoba will remain an entity to be respected in the international power system community. ■

Award Brings Prestige to Canadian Companies

By Aga Foltyn

Like many Canadians, Claudette MacKay-Lassonde first learned of the tragedy at Montreal's École Polytechnique while watching the evening news on December 6, 1989. Fourteen women, thirteen of them engineering students and one a staff member, were gunned down by a madman. But for MacKay-Lassonde, a graduate of the school and a professional engineer who was "very, very active in promoting engineering to young women as the career of choice", what happened that day had a more profound impact. She knew immediately that something had to be done to honour the women. That same year she founded the Canadian Engineering Memorial Foundation.

The Foundation aims to provide opportunities and inspirations for

young people, especially women, studying engineering. It offers promising students a variety of scholarships and awards, and honours universities that foster a positive learning environment for women in engineering. Through a Corporate Award, the Foundation also recognizes companies that further the advancement of women in the profession.

The Corporate Award is one that MacKay-Lassonde, chairman and CEO of Enghouse Systems Ltd., thinks is particularly significant. In establishing the award, she says, "We wanted to recognize corporations that were doing the right thing with respect to the integration – the full integration – of women engineers within their corporations. We thought they could be examples to

other companies as to what can be done and how it can be done".

Past recipients of the award have been Wardrop Engineering Inc., based in Winnipeg, SaskPower in Regina, and Fortier, Franklin, Legault Inc., in Laval. "The Canadian Engineering Memorial Foundation's Corporate Award provided our company with the opportunity to make others aware of our corporate philosophy regarding the advancement of women in engineering," said Lloyd McGinnis, now retired as chairman and CEO of Wardrop Engineering. The company established a "Women in Science" committee and encouraged its women engineers in numerous initiatives aimed at reaching elementary, high-school and post-secondary students.

While the Corporate Award has no monetary value, its prestige comes from what it says about a company's values. "A company that wins this kind of award would cer-

tainly be very attractive to women engineers," MacKay-Lassonde says, because the award demonstrates the company's commitment to support women in the profession. "And nowadays, in the competitive environment we're facing, you don't want to attract only men engineers. If you can attract both men and women on an equal level, you're far ahead of the competition."

To request an application form for this year's Corporate Award competition which closes September 10, 1999, or for more information about this or any of the Foundation's other awards and scholarships, contact :

Deborah Worrard,
Executive Director,
Canadian Engineering Memorial
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401-116 Albert Street,
Ottawa, Ontario, K1P 5G3,
Fax: (613) 230-5759,
E-mail: memorial.foundation@ccpe.ca ■

Environment and Sustainable Development

The Kyoto Protocol – Opportunities, Challenges and Obligations

By: L.J. Van Dusen, P.Eng.

Global Warming is the potential change in the Earth's climate due to increasing levels of carbon dioxide and other greenhouse gases in the global atmosphere. In 1992, nations met in Rio de Janeiro to sign the Climate Change Convention, a voluntary agreement to reduce greenhouse gas emissions to 1990 levels by the year 2000. This Convention was followed in 1997 by the Kyoto Protocol. The following article summarizes the Kyoto Protocol and some of the implications for Manitoba.

The Kyoto Protocol is a global treaty, negotiated by over 160 countries, whose purpose is to limit the release of greenhouse gases. The specific commitments apply only to 38 developed nations with no obligations for developing countries. The Kyoto Protocol will come into effect when 55 countries representing 55% of the developed countries' emissions formally ratify the agreement. The six greenhouse gases listed in the Protocol include carbon dioxide, nitrous oxide, methane,

halocarbons (chlorofluorocarbons and hydrochlorofluorocarbons), perfluorocarbons, and sulphur hexafluoride.

The individual nations participating in the negotiations agreed to different emission reduction targets; Canada's target is a 6% reduction below 1990 levels. The overall average global reduction in emissions is 5.2% from 1990 levels by the time period from 2008 to 2012. To determine compliance with the Protocol, emissions are to be averaged over the five year period from 2008 to 2012.

Canada only releases about 2% of the global emissions of greenhouse gases but is one of the highest emitters on a per capita basis. In 1996, Canada's emissions were estimated to be about 12% above 1990 levels (i.e., 671,000 kilotonnes CO₂ equivalent). Current projections are for Canada's emissions to increase by up to 20% by 2010; consequently, the total reduction in greenhouse gases required by 2008 to 2012 may be up to about 25%.

Manitoba releases about 3.3% of Canada's greenhouse gas emissions (i.e., 22,300 kilotonnes in 1996). On a per capita basis, Manitoba's emissions are lower than the national average for several reasons. First, unlike other provinces, most power is generated by hydroelectricity rather than by coal- or natural gas-fired thermal power plants. As well, the industry sector is not a big contributor in Manitoba because the province has relatively little energy-intensive industry.

In 1996, the largest sources of greenhouse gases in Manitoba were transportation (36%), agriculture (35%), and stationary fuel combustion (22%). Agricultural sources include nitrous oxide emissions from soils, enteric fermentation and manure management. Stationary fuel combustion includes fuel combustion by the industrial, residential and commercial sectors.

Canada's approach is to have a national implementation plan in place before ratifying the Protocol. A multi-stakeholder, multi-govern-

ment, national process has been established to develop options for this national plan. In this process, 15 "Issue Tables" have been established to review the relevant sectors. These Tables include, for example, electricity, agriculture, transportation, public education and outreach, buildings, etc.

Canada's efforts will build on the 1990 National Action Plan on Climate Change which included the Voluntary Challenge and Registry (VCR) Program. In the VCR program, Canadian companies are challenged to voluntarily limit their greenhouse gas emissions. Companies registered with the VCR are expected to develop, implement and report on their individual action plans.

The Kyoto Protocol may have some positive impacts in Manitoba. For example, the Protocol provides the incentive and motivation to i) increase energy efficiency of equipment, buildings, vehicles, etc.; ii) switch to other less carbon-intensive energy sources (e.g., hydroelectricity, natural gas, etc.) that are also less polluting; and iii) promote energy conservation and heat or energy recovery.

The potential exists for some negative effects as well. The

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The Impact of Cross-Cultural Differences on The Engineering Profession

By: Lionel Laroche, Ph.D., P.Eng.

The rapid globalization of the world's economy has a significant impact on the way Canadian engineers work by bringing them more frequently in contact with non-Canadian clients, suppliers, or peers. These interactions offer many opportunities to Canadian engineers.

While bringing numerous opportunities, the globalization of the economy also brings significant challenges. Indeed, these differences in approaches, values, and expectations between customers and suppliers, or between team members of different cultural backgrounds, have led to many project failures^[1]. Understanding the impact of cross-cultural differences can therefore increase the probability of success of an international venture.

Is engineering affected by cross-cultural differences?

Engineers are trained to focus on technical data, and scientific evidence. Because the laws of physics are universal, engineers tend to expect that nationality and cultural differences do not play a significant role in the practice of engineering.

For example, car designs differ significantly from country to country. The models sold by GM and Ford in Europe are quite different from their North American models. Few people mistake cars designed by Italian manufacturers like Ferrari and Lamborghini with cars designed by Swedish manufacturers like Volvo and Saab. These visible differences in the end product are the result of differences in approaches, values, and preferences of both engineers and their customers.

The impact of cross-cultural differences on individual engineers

Communication

Miscommunication across cultural lines is usually the most important cause of cross-cultural problems in multi-national situations. Miscommunication can have several sources:

- **Differences in body language or gestures:** The same gesture can have different meanings in different parts of the world. For example, Bulgarians shake their heads up and down to mean no.

- **Different meanings associated with the same word:** Words can have different meanings in different parts of the world. The verb "to root", as in "rooting for one's favorite team", means "to have sexual intercourse" in Australia. Australians "barrack" for their teams.

- **Different assumptions made in the same situation:** The same event can be considered in different ways. The sight of a black cat is considered a lucky event in Britain, while it is considered unlucky in many countries.

The examples presented here illustrate cultural differences that are both large and simple in the sense that they focus on a single cultural aspect that keeps the same meaning regardless of context. As a result, such differences will often be identified on the spot. By contrast, subtle or complex differences are often identified much later in the communication process, by which time corrective action requires considerable effort and money. In more severe cases, this realization occurs so late that there isn't enough time to address it, resulting in a failed deadline.

Standards

Different countries use different standards and measurement systems. For example, differences in power frequency have led European users of high-tech American equipment to purchase a dedicated power generator that would deliver the right voltage frequency, i.e. 60 Hz versus 50Hz.

Differences in approaches

Given the same technical problem, the approaches used by engineers of different cultural backgrounds are likely to differ widely. In some countries, like France and Greece, engineers tend to emphasize theoretical or mathematical approaches over experimental or numerical ones, while other countries, like Canada and the United States, tend to favor experimental or numerical approaches.

Differences in approaches also arise from the differences in resources at hand. For example, differences in labour costs and skills make process automation and the use of heavy equipment valuable in

developed countries, while using large numbers of unskilled workers may be a preferred approach in developing countries.

The impact of cross-cultural differences on engineering organizations

Cross-cultural issues also arise at the organizational level, because companies in different countries organize their day-to-day business differently.

The relative hierarchy of departments

The relative power of the various departments within a corporation is often a function of the country where the corporation has its headquarters. Manufacturing departments of German-based companies have power relative to their marketing and sales counterparts that many Canadian and American manufacturing departments can only dream of. German manufacturing departments are often able to limit the number of products offered. By contrast, Canadian and American manufacturing departments tend to follow the lead of the marketing and sales departments, which tend to favor a larger number of options since this increases the probability of offering what each potential customer is looking for.

The way information is shared and distributed

The way information moves within a company varies significantly from country to country. Germans tend to share information only with people who they believe have to know^[2]. In Canada, information tends to move within departments and to cross departmental boundaries more freely. Information flows along the lines of the networks built by each individual.

Patent protection

Engineering organizations need to be aware of the differences in patent systems that exist around the world in order to achieve the desired level of protection for their intellectual property. Canada and the United States have a "first-to-invent" policy, while the Europeans have a "first-to-file" policy.

The hiring process

Interviewers look for different skills

and attributes in candidates. Cross-cultural differences are fairly significant in this area. People interviewed for positions in France will be asked personal questions that are considered illegal in Canada, such as age, marital status, and number of children. German interviewers routinely ask candidates for the profession of their parents.

More importantly, there are significant differences in the types of skills that interviewers look for in candidates. One of these important differences comes from the different time horizons that people have in different countries. In France, engineers hired by a large corporation are expected to work for this corporation for the majority of their careers, and large French corporations tend to hire people based on their potential and then find them a spot within the organization. As a result, French interviewers tend to emphasize specific technical knowledge less and soft skills more than Canadian interviewers. Canadian companies tend to look for someone who has specific technical skills to fill a particular position that is currently vacant and do not expect the hired engineer to remain with the company for most of his or her career.

How can an individual engineer avoid cross-cultural pitfalls?

A Canadian engineer working with foreign clients, suppliers or peers can prevent many cross-cultural issues by paying an unusual amount of attention to proper communication. Here are a few tips that will help avoid miscommunication:

- **Clarify:** When in doubt, ask; if not, ask anyway. It is important to ensure that your counterpart has understood everything you meant to say and nothing else. Ask the person to feed you back what you have told him or her in their words. This is particularly important when things seem to fit, but not quite.
- **Go into the details:** It is often tempting to agree on general principles and leave details to further discussions for brevity's sake.
- **Summarize:** The time taken to summarize the decisions made during a meeting and to issue minutes of meetings is often a good investment, since it helps prevent future challenges of

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Cross-Cultural Differences

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- these decisions and ensures that action steps are actually implemented.
- Simplify: Use simple words that are easily understood and be consistent. Using synonyms can confuse your counterparts unnecessarily, particularly if they are not native English speakers.

Corporations can avoid cross-cultural problems while taking advantage of diversity

There are several ways of reducing the magnitudes of cross-cultural problems while reaping the benefits of working with foreign customers, suppliers, or associates.

Hire foreign engineers

This option can be very effective when a company has decided that a given country or countries will play a major role in its future.

Use cross-cultural trainers

Cross-cultural training organizations can shorten the learning process by delivering the needed training to companies in a timely and targeted fashion. In this case, the necessary cross-cultural information is shared with all involved company employees, rather than being limited to the people who have had the corresponding experience. Cross-cultural training organizations can provide training on many topics, including:

- How to do business in a given country or region.
- How to make presentations in a given country or region.
- How to select the right people for international assignments.

- How to prepare employees for expatriate assignments.
- How to improve the productivity of multi-national teams.

Find local partners

Setting up agreements with local partners, in the form of joint ventures or licenses, or purchasing a local company, can be an effective way of combining strengths. This approach can be very effective when trying to break quickly into a new market since it allows a company to benefit from the knowledge and experience of its partners.

Take advantage of cultural diversity

When effectively managed, the diversity of approaches that exist around the world can be quite beneficial and can lead to significant improvement in both work processes and outputs. One way to take

advantage of cross-cultural differences was devised by a captain of the French Foreign Legion. When faced with significant problems, he would pair someone coming from a North European country (like Germany) with someone from a South European country (like France or Italy). He would put the South European individual in the lead during the first part of the process, when potential solutions are generated and compared. The North European person would take the lead during the implementation part. This takes advantage of the “theoretical” bent of the French and the Italians, while taking advantage of the attention to detail and execution typically shown by the Germans. ■

References

[1] *Blunders in International Business*, David A. Ricks, Blackwell Business Press.

Geoscientists Question the Reality of Global Warming

By: B. Stimpson, P.Eng.

“Science exaggerates El Nino impact for funding” says Professor John Hannigan (a sociologist) from the University of Toronto (*Winnipeg Free Press*, August 2, 1998), and to this end “oceanographers and meteorologists have fed a media frenzy over the phenomenon.” Though scientists have been aware of the periodic warming of the east Pacific since the 16th century and its causes remain speculative, El Nino has captivated the mind and raised anxieties (and research funding) as never before.

Humanly-induced global warming is another climatic phenomenon that has generated billions of dollars in research funding. It is, of course, of much greater significance than El Nino because a one-way heating trend rather than a periodic event could initiate global and permanent change in ocean levels and climate. Such effects would impact engineering projects and planning on an enormous scale (e.g. water distribution, hydro-power, coastal defences against rising sea levels).

The idea that human activities could cause warming of the earth’s climate is being questioned by a group of geoscientists in the U.S. who view the attention being paid to this issue by the Clinton administration as undergirded by questionable

predictions of climate-related catastrophes and driven by opportunities to increase government controls. Ron Pritchett is a representative of this group and has recently published an article in *The Professional Geologist* (January 1998) entitled “Geology and Climate-Change Policy”. Is human activity really increasing CO₂ levels? Is it possible that global climate can be altered or stabilized by national and international policies? Pritchett argues from the research literature that prevailing answers to these questions are suspect.

On the issue of increasing CO₂ loading, Jaworowski and co-authors (1992a, 1992b) found that data on atmospheric levels for the 19th century had been selected in such a way as to lead to a general assumption of lower levels last century and, furthermore, concluded that the accuracy of procedures used to detect past CO₂ in ice-core sampling was such that “the claimed signals of man-made CO₂ increase are of the same magnitude as the range of uncertainty of measurements.” Furthermore, “As indicated by the measurements of radiocarbon (C₁₄) from nuclear test explosions the residence time of CO₂ in the atmosphere is only five years. Assigning a longer atmospheric residence time

(up to 200 years) for man-made CO₂ was made to fit the preconceived idea that the 19th century CO₂ atmospheric level was 25% lower than now. The value of about 280 ppmv (parts-per-million by volume), widely accepted from glacier studies as the pre-industrial atmospheric CO₂ level results from invalid assumptions, processes in ice sheets and artifacts in ice cores.”

It is Pritchett’s view and that of others in the geoscience community that the enormous natural sources and sinks for CO₂, such as volcanic emissions (an estimated 80% from deep-sea emissions), depletions in flora, nuclear reactions high in the atmosphere, carbonate precipitation, photosynthesis, and gas hydrates, can mask the small-scale influence of human contributions to the sys-

tem (see Table 1 (Pritchett, 1998)).

According to Van Andel (1994), natural processes in the geologic past are estimated to have led to atmospheric levels of CO₂ three to 17 times higher than today’s levels. In any case, climate cycle evidence suggests the world is between ice ages, and large ice sheets could again cover extensive parts of the northern hemisphere within 23,000 years. Perhaps, Pritchett speculates, global warming might be beneficial!

The role of water vapour as a greenhouse-gas is far greater than that of CO₂. Quoting from Lindzen (1996), “Roughly speaking, changes in relative humidity on the order of 1.3 to four percent are equivalent to the effect of doubling carbon dioxide.”

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Table 1

Current Carbon Reservoirs, Annual Natural and Man-Made Fluxes (GT=Gigatonnes)	
Reservoirs	GT of Carbon
Sediments (near surface)	60,000,000
Marine dissolved inorganics	38,000
Fossil Fuels (exploitable)	7,200
Soil	1,300
Marine dissolved organics	1,000
Atmosphere (pre-industrial)	727
Terrestrial biomass	42
Annual Fluxes – Natural	
Ocean	106
Land	63
Total	169
Annual Fluxes – Man-Made	
Fossil fuels and land use	6

The Kyoto Protocol – Opportunities, Challenges and Obligations

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Protocol may lead to increases in fuel costs (e.g., due to higher demand for natural gas and renewable fuels, etc.) and costs for transportation (e.g., due to increased fuel costs), leading to higher prices for goods and services. The sector review of agriculture may have implications on how soils are managed and the current trend towards intensive livestock operations in the province.

Manitoba does face some challenges in trying to meet the provisions of the Kyoto Protocol. For example, existing capital investment in equipment and buildings means that investment in energy efficiency may be delayed; industry may prefer to replace its equipment as it reaches the end of its service life, rather than sooner. As well, the need exists to reduce emissions while maintaining or improving economic growth and competitiveness.

The Kyoto Protocol, however, does present many opportunities for Manitoba to promote its engineering knowledge and expertise. For example, hydroelectric power is being

touted nationally and internationally as an alternative to fossil fuels. Research opportunities exist in clean fuels, renewable energy technologies, energy efficiency, carbon sinks through management of agriculture and forests, etc. As well, the marketing of existing technology (e.g., R-2000 for housing, C-2000 for commercial buildings, etc.) has potential.

In addition to these potential business and research opportunities, the Kyoto Protocol also provides engineers with an opportunity to demonstrate that they are meeting their obligations under the Code of Ethics. Specifically, Canon 2 of the code of Ethics states that "Each practitioner shall regard the physical, economic and environmental well-being of the public as the prime responsibility in all aspects of professional engineering and professional geoscientific work." Further, Canon 2.3 requires that each practitioner "...shall ensure that designs and work for which he or she is professionally responsible are based on sound environmental principles." ■

Geoscientists Question the Reality of Global Warming

Continued from page 15

What is the evidence for global warming? According to Pritchett's review of the literature, "Consistent, satellite, atmospheric-temperature measurements during the last 17 years...show no increase in temperature for either the northern or southern hemisphere." Despite the media-propagated view that global warming is occurring, Pritchett says there is, in fact, no consensus on this matter.

Climate change has moved, as this article suggests, out of the scientist's laboratory and into the political arena where money and power influence decision-making and funding. This, in itself, is no new phenomenon (e.g. the enormous influence wielded by physicists this century in obtaining funds for high-cost nuclear research). What is different about this debate is that policy decisions and regulatory controls that could evolve from them (e.g. carbon tax) could have enormous economic consequences for the world. And, suggest Pritchett, "forced reductions in CO₂ emis-

sions, from a geological perspective, will neither stabilize global climate nor improve personal liberty for adapting to climate change."

Finally, Pritchett's article is as much a polemic against the intrusions of government in the market place as it is science, and also a plea for geoscientists to use their unique perspective to ensure that fact is separated from fiction. ■

Pritchett, R.W. (1998) Geology and Climate-Change Policy. *The Professional Geologist*, January, pp.9-11.

Jaworski, Z., Segalstad, T.V. and Hisdal, V. (1992a). *Atmospheric CO₂ and Global Warming: A Critical Review*. 2nd revised edition, Norsk Polarinstitutt, Oslo, Norway.

Jaworski, Z. and Segalstad, T.V. (1992b). Do Glaciers Tell a True Atmospheric CO₂ Story? *Science of the Total Environment*, V. 114, pp. 227-284.

Lindzen, R.S. (1996). Global Warming and Eugenics. In "Risks, Costs, and Lives Saved," Robert W. Hahn (ed.) p. 85, Oxford University Press.

Van Andel, J.H. (1994). *New View On An Old Planet – A History of Global Change*. 2nd Edition, Cambridge University Press.

URBAN SYSTEMS

STORMWATER ENGINEERS

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