

Professional Engineer



Mandatory Professional Development Program: Pilot Project Results

By: R. Kroeker, EIT

The progress of the Mandatory Professional Development Program (MPDP) was reported to 49 APEM members at the June 18, 1998 PD breakfast meeting. Committee Chair Bob Bruce and subcommittee member Wally Jackson detailed the background and results of the MPDP pilot project, and Councillor Ron Britton explained the relationship between the MPDP and the Continuing Competence (CC) program.

According to Jackson, the MPDP pilot program provided an opportunity to introduce the program to the membership, assess the proposed full program, and identify needed improvements. The response from member volunteers had been carefully evaluated, and served as the basis for numerous changes and improvements.

Ten groups of between 7 and 12 members participated in the pilot project and represented

APEM membership from Winnipeg and ten other Manitoba towns and cities. The groups met four times to fill out sample MPDP reporting forms, to create individual development plans, and to evaluate the process and the outcome of their efforts. At the end of the pilot project, most participants observed that the requirements of the program were not difficult to meet, nor did they create unreasonable resource demands. Although some participants reserved their concerns about mandatory reporting, in general the group members supported the essential concept and design of the MPDP, and had suggested several changes, which have been incorporated into the revised MPDP.

The revised MPDP will increase the potential hours for professional development (PD) points gained through formal education from 30 hours to 40 hours per year, in recognition of the time com-

mitment required for such an effort. Two other outcomes of the member response involved remedial changes to the reporting forms and plans to discuss the interaction of the MPDP and the continuing competence program.

Maintaining a positive MPDP record over an average of three years is the indicator APEM will use to determine if members are meeting the requirements of their APEM registration with respect to the Continuing Competence (CC) program. Ron Britton discussed proposed steps whereby the MPDP plan would be enforced. As a positive approach to ensuring compliance, APEM would provide support at no cost to members who request assistance in completing the required report forms prior to the deadline. Support, at member cost, would continue to be available after

Continued on page 5

We're On-Line!

By: B. Stimpson, P.Eng.

It took 407 hours of effort to bring to completion and requires 25.6 Mbytes of storage on a hard disc. These impressive numbers refer to APEM's Web Site at <http://www.apem.mb.ca>, which was formally released for general use on June 26, 1998.

The mastermind behind the site, who voluntarily invested those 407 hours, is Dr. Witold Kinsner, P.Eng., Professor of Electrical and Computer Engineering at the University of Manitoba. I had the opportunity to meet with him among the stacks of papers and books in his office to learn more about APEM's new site.

Stimpson: What information can be found on the site?

Kinsner: A lot! You really need to take a look to fully appreciate how much is there. There are 1,212 items totalling 7.049 Mbytes with everything the EIT or P.Eng. needs to know about APEM and professional practice, even down to the forms that have to be filled in

from time to time. Complete back issues of *The Manitoba Professional Engineer* to October 1997 can also be found.

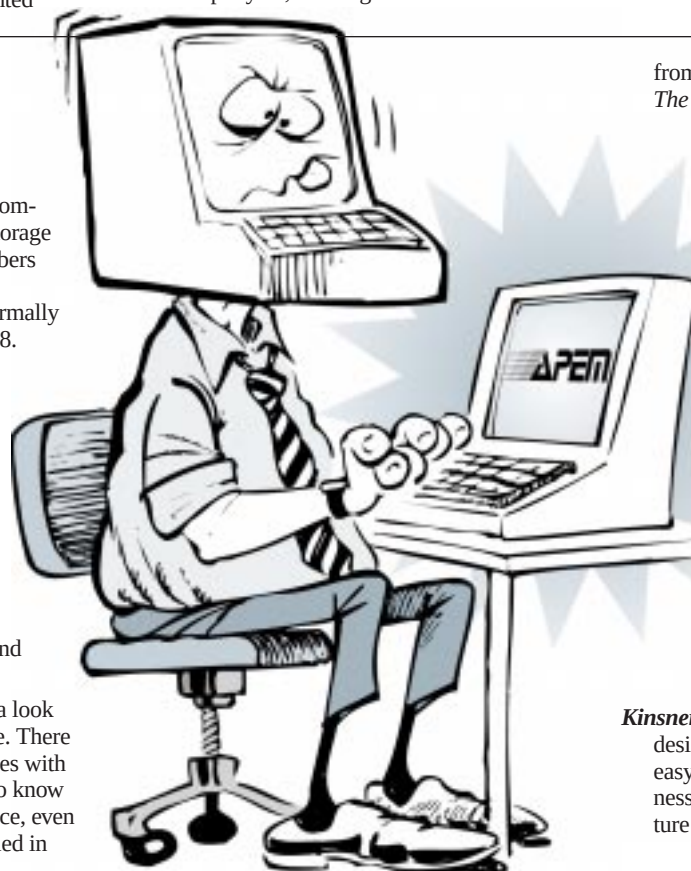
Stimpson: For whom is the site intended?

Kinsner: It was decided that the site should be wide open to the public as well as EITs and registered members. APEM is not a secret guild but is here to serve the public. There is an "Ask and Get Service" section containing information specifically for the public. However, all sections are open to anyone.

Stimpson: I understand that the site has unique design features. Can you explain?

Kinsner: Yes, it does. Because of the proprietary design concepts, the user will find the site easy to move around and fast. Its user-friendliness is due to its hierarchical, modular structure in which one can travel from layer to

Continued on page 5



**August 1998**

Published by the Association of Professional Engineers of the Province of Manitoba
850A Pembina Highway
Winnipeg, Manitoba R3M 2M7
Ph. (204) 474-2736 Fax (204) 474-5960
E-Mail: apem@apem.mb.ca

APEM COUNCIL

P. Washchysyn, P.Eng., President
A.E. Ball, P.Eng.; M.G. Britton, P.Eng.
E. Eddy, Ph.D., B.P.T., M.C.P.A., M.C.S.P.
J.R. Hosang, P.Eng.; J.M. Macleod, P.Eng.
K.F. Olisheski, P.Eng.; A.J. Pollard, P.Eng.
K.J. Pratt, P.Eng.; C.S. Roberts, P.Eng.
J.M. Symonds, P.Eng., Past-President
B. Thomson, R.N.

APEM STAFF

D.A. Ennis, P. Eng., Exec. Director and Registrar
S.M. Matile, P. Eng., Director of Admissions
K.A. Buhre, P. Eng., Manager, Administration
J.C. McKinley, Administrative Officer
D. Bilodeau, Admissions Co-ordinator
E. Ryan, Accounting & Membership
L. Dupas, Receptionist/Secretary
J.A. McCorister, Administrative Secretary

COMMUNICATIONS COMMITTEE

S.C. Alford, P. Eng., Chair;
M. Baril, EIT; J.W. Bogan, P. Eng.;
V.L. Dutton, P. Eng. (Ret.);
A. Kempan, P.Eng. (Ret); B. Stimpson, P.Eng.

CORRESPONDENTS

P. Yamada, P. Eng., Thompson
S. Trivett, P. Eng., Brandon

The Communications Committee would like to hear from you. Comments on your newsletter can be forwarded to us through the Association office. 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 APEM or the APEM Council.

**In Memoriam**

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

Bryan N. Dick Jerome H. Gasper
Edmund K. Overgaard Desmond B. Willis

**NEW MEMBERS REGISTERED
MAY & JUNE 1998**

K.L. Anger (ON)	D.R. Makinson
S.C. Arabsky	E.B. Martens
R.W. Bailey (AB)	E.B. Martin
S.K. Basu	I.J. Montufar
T.S. Bharj	M.A. Murphy (NB)
G.D. Buchanan	C.H. Ng (NB)
M.J. Caswell	L. Nguyen
M. Chehabeddine (PQ)	J.K. Pierson (BC)
D.J. Dankewich	T.A. Prentice
R.B. Dodds (ON)	C.A. Reed (SK)
C.H. Feeg (AB)	D.B. Smith (ON)
B.I. Forsyth	B.J. Szafron (AB)
P.A. Forsyth	R.P. Vercaigne
J.D. Jacques (ON)	J.H. Vierhuis (ON)
K.S. Kozakewich (AB)	D.L. Wingerak (SK)
J.P. Lue Choy (ON)	K.C. Yuen

**MEMBERS DEREGISTERED
MAY & JUNE 1998**

R.C. Aelick	R.E. Lightly
D.C.N. Alexander	G.M. Liukko
A.D. Asmundsson	W.L. Lozinski
C.A. Baron	I.M. MacGougan
J.B. Barrick	G. Maretzki
B.M. Bodnaruk	N.P. McGlaughlin
Y. Bourlas	J. McIntyre
W.M. Candline	S.E. McKyes
R.B. Clapham	A.R. Morrison
G.G. Clow	H.G. Neufeld
C.F. Connors	P.P. Papanikolas
M.H. Crooks	A. Patel
D.G. Davis	S.L. Pidhayny
M.A. deVette	I.G.T. Power
R. Del Frate	K.P. Ratzlaff
S.J. DeLory	A.R. Rege
J.Z. Demiany	G.P.D. Rogers
D.M. Evans	M.J. Rosseker
R.P. Fallowfield	D.K. Roth
G.P. Gerhardt	S.R. Russell
Z. Gong	R.L. Saldanha
W.R. Goddard	T.L. Schaffnit
V.D. Gupta	M.A. Schor
T.B. Hanna	A.C. Shiels
R.C. Hannah	J.E. Sigurdson
R.L. Himbeault	G.K. Turnbull
K.A. Holdsworth	P.R. Van Arnhem
K.S. Jhass	V.F. Venda
R.K. Johnston	H.E. Wichert
S.C. Kaminski	H.D.B. Wilson
C.M.L. Kelly	R.T. Yanos
B.W. Kondratuk	

**RESIGNATIONS
JUNE 30 1998**

B.H. Allen	A.M. Lansdown
D.H. Anderson	D.B. Leech
N.R. Bulley	B.W. Leitch
T.D. Coombs	R.L. Maunsell
W.P. De Monye	A.J. Melnyk
R.E. Derksen	B.J. Mitchell
L.E. Dunn	P.M. O'Hara
S.J. Eckart	D.S. Overwater
G.A. Gault	V. Redko
Y.E. Haddad	W.J. Sissons
G.M. Henry	R.J. Smegal
W.R. Hughes	J.M. Wong
K.J. Korman	

**LICENCES ISSUED
MAY & JUNE 1998**

D.S. Ball (IA)	P. Kozicki (SK)
M.H. Berry (NY)	B.J. Krantz (WI)
J.R. Boekelman (NY)	M.P. Roxburgh (FL)
C.F. Cooper (ON)	D.R. Sarauer (AB)
B.A. Derks (ON)	A.W. Saunders (AB)
T.G. Fowler (NY)	E.R. Schultz (FL)
P.D. Galloway (NJ)	R.R. Sneddon (ON)
M.S. Gralund (OR)	G.R. Spencer (FL)
D.R. Iverson (MN)	R.M. Stubbs (BC)
W.T. Johnson (SK)	D.M. Stuart (FL)
P.J. Kelly (FL)	P.A. Surace (PA)

**EITs ENROLLED
MAY & JUNE 1998**

S.H. Assaad	M. Lioubachevski
D.V. Bonin	M.M. Majcher
T.J. Bryant	K.P. Merriam
K.L. Burbank	M.A. Michaluk
P.B. Collins	T.F. Pavlicic
P.E. Davies	J.M. Pawluk
M.F.R. DeProphetis	B.K. Perkins
R.A. Fidler	A.M. Reeves
C.J. Gentile	R.W. Reidy
R.L.J. Girouard	K.A.S. Saxton
D.B. Gosse	D.J. Schmidt
L.T.H. Grieger	T.W. Shanks
A.M. Juck	C.I. Shesaf
C.J. Kroeker	C.M. Tellier
C.L. Lichkowski	S. Walberg

**EIT RESIGNATIONS
JUNE 30 1998**

D. Cule	R.B. Schilling
P.V. Godavari	N.E. Scott
M.R. Koshel	R.W. Simmons
R.J. Ostrowski	S.M. Stoller
A.N. Passalis	C.E. Wilford
S.C. Roziere	P.A. Wishart

**EITs REMOVED FROM
ENROLLMENT
JUNE 30 1998**

W.T. Anderson	K.J. Kempthorne
D.F. Collette	G.A. Lagadi
B.D. Cooke	D.M. Lamblin
T.A. Corbet	A.W. Ludlam
T.N. Crilly	L. Osmani
M.R. Delaquis	B.E. Pistun
B.A.C. Douglas	A.C. Rosales
C.W. Flatley	G.L. Tait
P.D. Hagar	J.B. Van Der Zweep
A.R. Jansen	F.J. Vanbeselaere

**RETIRED
JUNE 30 1998**

D.W. Andrey	K.C. Kao
W.A. Fast	C.A. McDowall
G.A. Ganske	R.R. McKibbin
R.J. Giesbrecht	R.J. McRae
R. Girulski	G.A. Morrison
P.V. Johnson	A.B. Sparling

LOST CONTACT

S/D.Gasser

President's Message

P. Washchyshyn,
P.Eng.



As you read this article, Bill 54 "The Engineering and Geoscientific Professions and Consequential Amendments Act" will have been approved by the Manitoba Legislature. Also, Bill 55, "The Certified Applied Science Technologists Act", should have been approved. The approval of our new Act, with very little opposition or debate, is the result of extensive effort by your Council, the Legislation Committee, our colleagues in the geoscience community, and staff, and in particular Dave Ennis, Don Spangelo, and the Executive Committee. Timely advice was also obtained from our Solicitor, Wells Peever, and communications consultant, Ed Martens, to lead us through the significant elements of the legislative process.

This action is a clear demonstration of our vision that the APEM "is a leader and a facilitator of the process that ensures excellence in engineering and applied technology for the public of Manitoba." Bill 54 has evolved through a proactive process of consultations and co-operative agreements with other professional groups and stakeholders, most notably the Manitoba Association of Architects and the Certified Technicians and Technologists Association of Manitoba. Joint Boards to provide a new forum to deal with inter-association issues in a proactive manner, seeking to avoid disputes and to be available to distribute information for the benefit of the public, have

been established with these two associations. Also, Memoranda of Understanding have been executed with the Association of Manitoba Land Surveyors and the Manitoba Association of Landscape Architects. Further extensive consultation has been undertaken with the Manitoba Mining Association, which supported the legislation.

There are a number of major positive aspects of the new Act, including:

1. Increased public protection through more-structured disciplinary provisions and public accountability.
2. A new nationally endorsed definition of the practice of professional engineering that "says what we do" and will more readily accommodate technological advances and industry changes.

Bill 54 has evolved through a proactive process of consultations and co-operative agreements with other professional groups and stakeholders, most notably the Manitoba Association of Architects and the Certified Technicians and Technologists Association of Manitoba.

3. A provision for mandatory professional development (By-law changes coming soon).
4. Provision for group and/or corporate practice of engineering or geoscience, and requirements for liability insurance.
5. A long-overdue recognition of the "engineering team" in Manitoba which opens up an opportunity for applied-science technologists and professional engineers to work with

increased effectiveness and to focus the team efforts on competing in the Canadian and global economy.

6. An opportunity for foreign-trained engineers and persons who do not hold recognized engineering degrees to practise professional engineering in a limited manner and thereby contribute more fully to the Manitoba economy. It also provides for increased mobility between provinces.
7. A general improvement in the Association's authority to respond to concerns more effectively, particularly through the monitoring of group practice.
8. Geoscientists will now officially be part of our Association, as supported by the Canadian Council of Professional Engineers and the Canadian Council of Professional Geoscientists. (Some 80 geoscientists are already registered as "P.Eng."s. Now they and their colleagues will be welcomed as "P.Geo"s.) Other provinces currently either regulate engineers and geoscientists under the same Act or are in the process of establishing such legislation.

The most recent wholesale change to the Engineering Profession Act took place in 1983 with some amendments in 1985. Engineering has been advancing tremendously since that time. The new Act recognizes these realities and should serve the public of Manitoba and our members well into the next century. □

Engineers in the News

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

Steve Alford, P. Eng., retiring Chair of the Publication (Communications) Committee, graduated from the 1998 Canadian Institute of Management's Four-year program in Management and Administration in June with honours and the bronze award. He accomplished this amazing feat while working full-time for the Department of National Defence.

As if this isn't enough, Steve is taking the next year off to attend Clarkson University in Potsdam, New York to obtain his MBA. Congratulations, Steve! And good luck with your remaining studies!

Two other members of this Association graduated from the same class. **Brett Todd**, P. Eng., took top honours with the gold award. Brett is a member of APEM's Salary Committee, who also finds time to work for Wardrop Engineering. Congratulations, Brett! **Halya Tataryn**, P. Eng., who recently moved to Alberta, also completed the program.

The proposed mandatory professional development program is clearly not a problem, here!

Lloyd McGinnis, P.Eng., a member with a long history of community and professional service and a long list of corresponding awards, recently received the University of Manitoba's 1998 Peter D. Curry Chancellor Award for his outstanding contributions to the university, the province, and the engineering profession.

Among his most recent contributions, Lloyd was a key player in the establishment of the Canadian Network of Centres of Excellence on Intelligent Sensing for Innovative Structures (ISIS Canada), who later became a member of its Board and is now its CEO. He also took a lead role in raising funds for a graduate scholarship in structural engineering while serving as a member of the University Development Council.

Lloyd McGinnis is a past-president of APEM. He has received APEM's Merit Award as well as CCPE's gold medal award; and he is truly a most deserving recipient. Congratulations, Lloyd! □

The Start of a New Era

A new era will start when the Association of Professional Engineers of Manitoba (APEM) becomes the Association of Professional Engineers and Geoscientists of Manitoba (APEGM). In preparation for this change, we need a new name for *The Manitoba Professional Engineer*.

While relaxing at the cottage or on long journeys to visit family and friends this summer, have some fun thinking of a new name, and send your ideas by mail to the APEM office (Communications Committee), 850A Pembina Highway, Winnipeg, MB R3M 2M7 or fax to (204) 474-5960.

Examples of the names of other professional engineering associations publications are *Engineering Dimensions* (PEO) and *Innovation* (APEGBC).

The deadline for submissions is Friday, September 4, 1998.



Research & Development

Brian Couch Discusses Quality Function Deployment

By: B. Zimmerman, EIT

On Thursday, April 30, 1998, Mr. Brian Couch of Motor Coach Industries was the guest speaker at the R&D Luncheon held at the Norwood Hotel. The topic of the presentation was a popular and well known production and communication tool called QFD which stands for Quality Function Deployment – a planning process that was developed by Joji Akao of Japan in the late 1960's. The aim of QFD is to provide a way to improve the design process of new products so that they are high quality from the beginning. Motor Coach Industries (MCI) used QFD in the design of its "E" coach, a project launched in May 1994 (see *The Manitoba Professional Engineer*, February 1998). Using the principles of QFD, MCI was able to complete the design project using a staff of 90 people in just 32 months while only using half the work stations and half the parts used previously with a reduction in MRP runtime of 25%!

Mr. Couch provided a description of QFD and how it is set up in a company. Simply stated, QFD is a detailed system for translating the needs and wishes of the customer into design requirements for the product or service you are trying to

provide. The result is a modern quality system aimed at increasing the market share by satisfying the customer.

Depending on the references on the subject, there are essentially six major steps in implementing the QFD process that create the nine elements of the QFD program. All the elements of the QFD program, once started, begin to take shape on what is termed the "House of Quality". This term describes a matrix that prioritizes design aspects of the project. The matrix contains the nine elements of QFD and provides the design team with a visual method of organizing design criteria, detailing customers needs, listing design priorities, showing product test results, and showing potential design conflicts – all in one graphic document. For example, the first step in QFD is determining what the customer deems important about the product or service. Visits to customer facilities were planned and questionnaires and interviews were carried out in order for MCI to translate customer needs into design requirements. Customer ideas, likes and dislikes are ranked and listed as "demand qualities" and are recorded in Section 1 of the matrix.



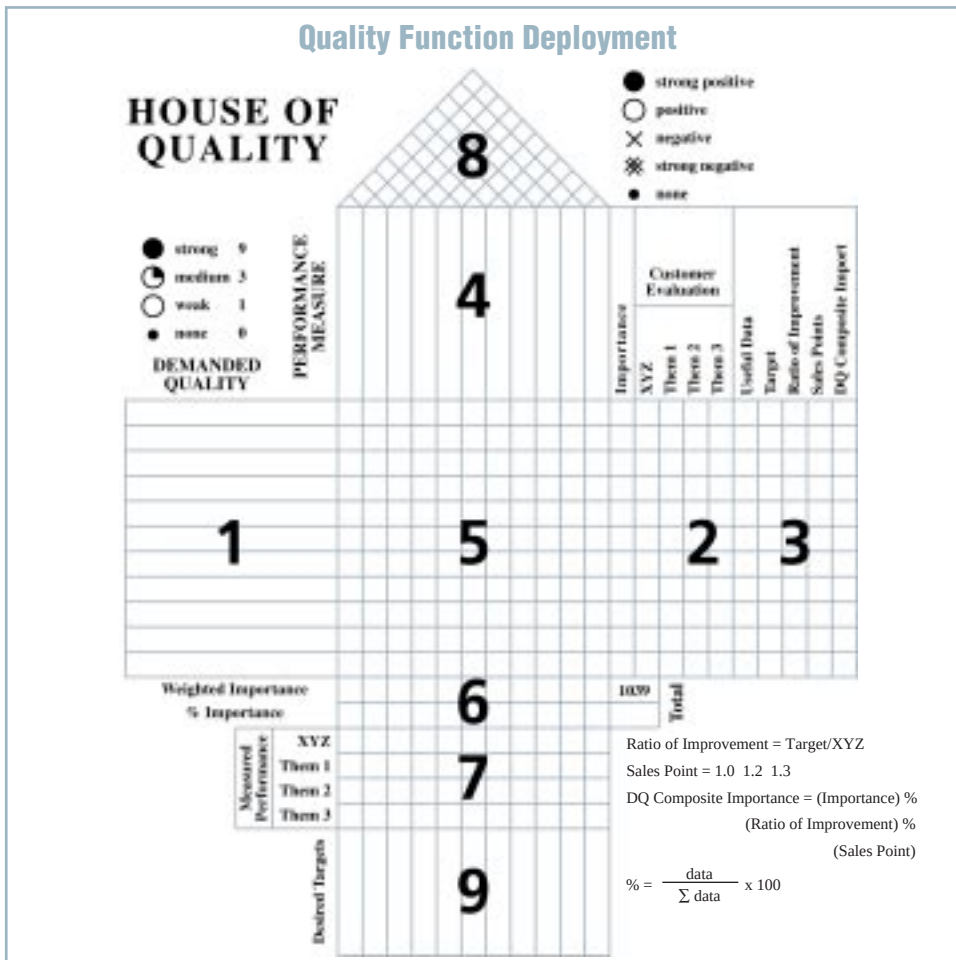
Bob Hamlin (l) thanks Speaker Brian Couch.

Once all six steps are addressed, design targets are identified and the product or service begins to take shape. Section 7 of the matrix lists the test data of the product or service. This area determines if the product is meeting all the design criteria set out by the design team and the data are recorded in engineering units of measure such as: number of cycles to failure, time to failure, pass/fail, or whatever the design team wishes to use in order to evaluate the design. Any conflicts with the performance measures are shown in Section 8 of the matrix, the peak of the house. In this area, positive or negative influences between the performance measures are shown. If there is a negative or strongly negative impact between performance measures, the design is compromised unless the negative impact can be designed out.

By cycling back and forth within the matrix, you fine-tune your design of the product before it hits production. The result is fewer engineering changes to the prototype parts and lower inventory and scrap material.

In summary, QFD is a planning and communication tool that focuses a company's resources on what is truly important about the design of the product. MCI, Ford, Harley Davidson, Chrysler, and many other companies have all used QFD with great success to develop world-class products more quickly than before. MCI has seen the benefits of such a program with the success of the "E" coach. Congratulations to all MCI employees on a job well done.

Any company interested in evaluating QFD for their next project should check the Internet using "QFD" for the search. Many useful articles and books by Glen Mazur and John Ternicko provide an easy step-by-step process for understanding QFD. □



University News

By: B. Stimpson, P.Eng.

AWARDS

Department of Biosystems Engineering

Dr. W. Muir – 1998 Maple Leaf Award, Canadian Society of Agricultural Engineering, the highest award given by CSAE.

Dr. R. Britton – Fellowship of Canadian Society of Agricultural Engineering.

Dr. Y. Chen – ARDI Grant of \$42,000 for two years for a project, "Development of high efficiency liquid manure injection."

Department of Civil and Geological Engineering

Mr. J. Taylor (Geological Engineering) – Canadian Institute of Mining and Metallurgy (Winnipeg Branch) Undergraduate Student Award

Department of Electrical and Computer Engineering

Mr. K. Ferens – UM Student Union and University Teaching Services Students' Teacher Recognition Award.



We're On-Line!

Continued from Page 1

layer (in depth) or laterally and know where one is at all times. It is very easy to return to where you started out. This is because of what I call "context-and-one-step navigations". I also designed for there to be no more than 5-6 layers, and pages and graphics are kept to a small size so that information comes up on the screen very quickly. Colours selected for the Web graphics can be displayed consistently on different platforms.

Stimpson: I can begin to understand why it took 407 hours to complete the site!

Kinsner: Yes! In comparison with sites of other professional associations, ours appears to be the most comprehensive. It has also been designed to facilitate maintenance by clear stencil-oriented page organization, modular design of sections in each page, and a self-explanatory file-naming convention.

Stimpson: Why did you put in this enormous effort?

Kinsner: I have donated this effort to APEM so

Pilot Project Results

Continued from Page 1

a deadline has passed. Failure to meet the requirements of the MPDP for any two of three years will trigger an APEM audit to investigate the member's professional development activities.

Are YOU Ready for the Vote on a Mandatory Professional Development Program?

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

This Association's proposed Mandatory Professional Development Program (MPDP) was developed last summer, introduced at the Annual General Meeting last Fall, tested by ten pilot-project groups throughout the province this winter, finalized this Spring, and approved by Council at its June 9, 1998 meeting. The Professional Development Committee, which researched, developed, tested, and refined the program, conducted a breakfast meeting on June 17. The purposes of the meeting were to explain the proposed program, the revisions resulting from the pilot project, and how it will affect all of the members of APEM, and to answer questions on any and all aspects of the program.

It was surprising, then, that only 49 people – 12 of whom were committee members, councilors, staff or pilot-project participants – attended the meeting. Could it be that all of our members understand the program, and have no further questions? Is everyone aware that a proposal to implement the program will be presented to the Annual General Meeting in October and, if

This audit, if unsuccessful, will reflect the Association's concern that the member's competence may be compromised, and will lead to a practice review.

The MPDP is scheduled to be introduced at the annual meeting for approval of a membership vote and, pending approval, be implemented in mid-1999.

approved there, sent to the members in the form of a mail ballot for approval?

Those in attendance learned that the requirements of the program are easily attainable – that for most, if not all, of us, it will simply be a matter of documenting what we do already. Do the rest of you realize this?

This proposal will affect ALL of the members of APEM. Please make sure that you understand the requirements of the program and be prepared to vote on it this Fall.

One more information session on this program will be held before the Annual General Meeting – on September 10. (See details on the enclosed calendar of events.) Meanwhile, the MPDP can be found at APEM's website: <http://www.apem.mb.ca>, or you may call the office (474-APEM) and request a "hard" copy. And you are encouraged to call, write, or e-mail any comments, questions, or concerns you may have to the APEM office, or to Bob Bruce, Chair of the Professional Development Committee, at 945-6636, or bbruce@nr.gov.mb.ca. □

that our Association can better serve its registered members, EITs and the general public by providing easy access to the comprehensive and current information about its activities.

Stimpson: What role has APEM played in the sites development?

Kinsner: Obviously, the information for release onto the Web was provided by the APEM office, specifically by Shirley Matile, P.Eng., Director of Admissions. Also, while the site was under development, there were critical reviews by various APEM members, including Council. The site certainly wasn't implemented in one step; their input was vital.

Stimpson: How will the site be maintained?

Kinsner: The responsibility for maintenance of the site now rests with APEM and specifically with Ken Buhr, P.Eng., Manager of Administration. Of course, I will provide any required consultation.

Stimpson: I am sure the APEM site will prove to be a significant step in the history of the Association. We owe you a debt of gratitude.

Kinsner: It really has been my pleasure. □

Anniversaries

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

Christmas 'eve, 1906:

The Canadian inventor of radio as we know it today, Reginald Fessenden, makes the first international broadcast of voice and music.

1947:

Bardeen, Shockley, and Brattain, at Bell Labs, invent the transistor.

1955:

The first integrated circuit, the size of a playing-card, appears, effectively bringing to an end the use of vacuum tubes.

1958:

Kilby, at Texas Instruments, develops the first germanium-based integrated circuit and, in the process, eliminates soldering in electronic manufacturing.

1972:

Conceived by Ted Hoff, Intel puts on the market its Intel 4004 micro-processor consisting of 2300 transistors.

Year 2000 Problem or Year 2000 Opportunity?

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

If you haven't heard of the Year 2000 problem by now, it's probably because you've just returned from your trip to Tibet; the one that your boss insisted you take by bus. Anyway, you're back now and it's obvious that our technological society is in an uproar about the year 2000. It all goes back to the time when mainframes ruled the earth, people programmed in COBOL, and memory cost \$20,000 a megabyte. To save money, wise managers decreed that years should be stored as two digits instead of four, probably the same managers who authorized your bus trip to Tibet.

Although ancient software is widely thought to be the culprit, the problem is greater than that. Other sources of potential grief are the embedded systems, the built-in, pre-programmed chips that govern everything from microwave ovens to nuclear reactors. A well-known and highly paid Year 2000 consultant invites anyone who knows of products that might experience date-related failures to report them to his Web site, <http://www.year2000.com>. The consultant will delete the sender's name and forward the report to the manufacturer's legal department by registered mail. If the manufacturer doesn't solve the problem and failures do occur, he will make a copy of the report available to attorneys, helping them to prove negligence on the part of the manufacturer.

Old programs can cause difficulty, but modern desktop applications pose a problem too. Popular products such as Excel, Access, Lotus 1-2-3, and Corel Quattro Pro can be affected. Excel and Access use a "fixed-date window" for determining whether a two-digit date should be represented as being in the 20th or 21st century. That window cuts off at 29, so two-digit dates less than 29 are interpreted as 21st century dates. Consequently, Access and Excel recognize 15 as 2015. However, both applications recognize 31 as 1931 – not 2031. However, wise users who have entered four-digit dates are safe from the bug.



The Year 2000 phenomenon has given birth to many children. Although it's clear there's a serious problem here, hysteria has overtaken many. For instance, popular magazines and TV shows claimed that elevators would stop working, – claims that were rebuffed by the manufacturers who said their elevators didn't know what year it was. These false fears are probably what prompted officials at Medtronic Inc., the world's largest supplier of heart pacemakers, defibrillators, and neurostimulators, to reassure patients that their devices would continue to function normally after December 31, 1999.

The Year 2000 has created many business opportunities for enterprising companies. IT/net Consultants of Ottawa announced a registered trademark on "Y2K®," and a solution to your Year 2000 problems. Computer Associates is offering CA-Fix/2000 as a new component to its Discovery 2000 package of software and services for addressing Year 2000 issues.

A shortage of workers available to tackle the Year 2000 problem will push costs for fixing the problem higher as the clock ticks toward the new millennium, experts say. As companies gear up and dive into the tasks of finding and correcting computer code, concern is mounting that the work force needed to handle the problem is becoming harder to come by, and harder to retain. Estimates for service revenue for outsourcers working on the millennium bug will peak at \$20 billion (US) in 1999, before dropping back to roughly \$15 billion in 2000. That compares with

only \$12.5 billion in 1997. Nor will the job be over in 2000. Experts say it will take years to perform clean-up work.

In Canada, we have many organizations promoting Year 2000 awareness. Chief among these was the Task Force Year 2000 chaired by Jean C. Monty, President and Chief Operating Officer of BCE

Inc., who released the Task Force Year 2000 report, A Call for Action. The Task Force of 14 chief executives was originally planning to make its report public in the spring, but moved up the deadline by four months because of the urgent situation. The report lists 18 recommendations for private and government bodies to deal with the Year 2000 challenge. Locally, we have the Impact 2000 organization, a collection of professional and business groups dedicated to raising awareness on Year 2000 issues.

It's interesting to note that the Year 2000 problem is not an orphan. In 1970, the turn of the decade confused computer systems which used a single digit to record the year. To those machines the digit "0" meant 1960, not 1970! In those days the programs were dedicated to one task and were not interconnected as they are today and consequently were much easier to fix. In 1996, some programs failed to account for the leap year and caused shutdowns on March 1 or the following January. The Year 2000 problem is also complicated by the leap-year phenomenon. Most years ending in "00" aren't leap years, except for those divisible by 40. Many programs are not designed to recognize this centuries-old rule.

One of the most dangerous date-bombs is set to detonate in the year 2038. Early versions of the C programming language determined the date by counting the seconds elapsed since January 1, 1970. It will run out of binary digits for recording time after January 12, 2038. So mark that date in your appointment book along with a notation to expect a delay in your paycheck. Better yet, take the day off. □

Attention EITs "Grandfathered" Under Pre-1995 "Two-Year" Rule

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

The "grandfathering" provision, allowing those who enrolled as EITs prior to 1995 to be registered with two, rather than the current four, years' acceptable engineering work experience, terminates December 31, 1998.

To be eligible for the "two-year" rule, you must have obtained 24 months' acceptable engineering work experience and completed all of the Pre-Registration Program by December 31, 1998. The requirements of the Pre-Registration program include obtaining at least ten professional development hours and two professional service points,

taking the professional practice seminar and passing the professional practice examination. Your final EIT Progress Report Form must be received by APEM no later than February 28, 1999.

These dates are firm. Absolutely no exceptions will be made.

If you are unable to comply in any respect with these requirements, or if the Association's Experience Review Committee does not consider 24 months of your experience to December 31, 1998, to have been acceptable, you will be

required to comply with the current four-year admissions criteria. This means that you will be required to obtain ten professional development hours and one to four (average two) professional service points for every 12 months of acceptable engineering work experience. This requirement will be effective January 1, 1999, and be applicable to every 12 months, and portion thereof, of your remaining requirements. (For example, if you have 21 months' approved experience as of December 31, 1998, you will require an additional 27 months' acceptable experience. With this, you must obtain 10 professional development hours and one to four (average two) professional service points during each of the first 12 months, the second 12 months, and the remaining three months, for a total of at least 30 professional development hours and six professional service points.) □

The Road Ahead...

A Profession Not in Demand

By: S.C. Alford, P. Eng.

Begging for workers". That's what the headline read in the May 2, 1998, *Winnipeg Free Press*. The accompanying article warned of a significant labour shortage that was stifling Manitoba companies. I read the article with interest but was disappointed, though not surprised, to find that the article didn't mention any shortage of engineers in our province. Electricians, information technologists, aerospace technicians, and sewing-machine operators are all apparently in short supply.

As I read, I couldn't help but think back to my high-school days when I was trying to decide what I wanted to do for a living. I can remember reading about the great shortage of engineers that was just around the corner; an engineering degree was going to be the hottest ticket around. Unfortunately, these predictions from 20 years ago have not come true. While certain narrow segments of the profession are in demand, the job market for most engineers can be just as tough as it is for people in many other walks of life.

The evidence of a problem goes much deeper than one newspaper article and one engineer's perspective on the job market. In his recent book, *Canada's Best Careers*, author Frank Feather ranks 120 careers in terms of projected growth in demand. None of the engineering fields made the top ten, or the top 50 for that matter. Only Aerospace Engineer cracked the top 100 at a ranking of 76. Three other engineering fields were mentioned with rankings between 107 and 114. Seeing engineering so far down the list kind of made me feel like a kid being picked last for a street hockey game. It would seem a young person today should consider being a surgeon (number four on the list), a pharmacist, a private investigator, an actor, or a grip (whatever that is). These jobs are all quite a way up from engineer on Feather's list.

"So what", you might say, "this is just another prediction of job demand and we all know how inaccurate predictions can be". We need something more meaningful, more tangible, to look at when examining the demand for a profession. Well, how about salary? And instead of attempting to glare into a crystal ball, let's look at a past trend. According to Statistics Canada, in 1961 the average Canadian engineer's income was equal to that of the average doctor or lawyer, give or take about 4%. By 1990, doctors were earning more than double the engineer's income and lawyers had us beat by 57%. It's a good thing there is more to life than just money.

Why have we lost so much ground to these two other professions? Why isn't there more demand for engineers? We live in a much more technological society today than we did 30 or 40 years ago. Shouldn't engineers rule the world, or at least be sitting pretty? Unfortunately, we haven't shown much care in managing our profes-

sion. We've assumed that we would be the main benefactors of increasing technology. After all, engineering is the practical application of science. While this may be the definition in my dictionary, we no longer have exclusive domain (or near exclusive domain) over the practical application of science. The boundaries of our profession have been chipped away at by technologists, technicians, chemists, physicists, biologists, computer network specialists, etc. The lines are blurry and are getting blurrier every year. We can no longer try to hide behind the Engineering Profession Act. We must think about how we want to position our profession to compete and succeed in the future.

One area that should be of immediate concern to engineers is the need to match the supply of engineers to the demand in the marketplace. Not just the overall numbers, and not just the numbers in specific fields, but also the specific skills and personal attributes that would make an engineer most valuable to employers. We have for too long operated under the assumption that more engineers is better. We have been preparing for this mythical shortage of engineers that is always just around the corner but never seems to get here. A greater supply of engineers lowers the price

which must be paid in the marketplace for engineering services. Perhaps the throughput at engineering schools should be reduced and the criteria for applicants made more strict?

While there is a healthy dose of self-interest in my concern about the demand for, and remuneration of, engineers, there are also larger public-interest issues to consider. Do we need highly skilled engineers in our society? If the answer is yes, we must ask ourselves if we can continue to attract many of the best and brightest students to engineering schools when engineering salaries have dropped so substantially in comparison to other professions, and when job prospects are not that great. Although engineering can be a rewarding profession in many ways, salaries and job-prospects do matter to prospective candidates.

There are many things we could be doing as a profession. However, it would seem that there is very little that we are doing, at least in comparison to some others. In the last couple of years, there has been a great deal of coverage in the news media of the efforts of other professions to protect job security, improve working conditions,

Continued on page 12

Engineering and the Future

By: T. Pietrafesa, EIT

Engineering as a profession has gone through many changes. Some have been good, others questionable. Since the beginning of civilization, engineering has made important contributions, such as the Roman aqueducts, the building of the railroads across Canada, and so forth. It was respected and ranked with the professions of Law and Medicine. In recent times, this position has become more of a myth than reality.

Recent evidence has suggested that the Engineering Profession is not understood or valued by the public. A survey was conducted of high-school students and the public on their views of engineering. It found that engineering is viewed as a dirty job and that the public think most engineering jobs are similar to that of a construction worker or mechanic. Many feel that engineering is a difficult degree to obtain, and the resulting salary is low. The survey also indicated that engineering is not regarded as a profession in comparison to Law or Medicine.

The reputation of engineering is not helped by the high levels of unemployment that plague the field. Many engineers who graduated ten years ago tell of the difficulty of finding that first job. Today, with a much weaker economy, it is much more difficult to find that first job.

Many engineering firms do not hire EITs; they simply hire engineering technicians because of

their lower wages and lower job-advancement expectations. With the EIT training period extended from two to four years, there will be fewer jobs for EITs since no company will want to deal with the greater training cost.

The way to reverse this trend is for APEM and the Faculty of Engineering at the University of Manitoba to show real leadership. First, the number of people allowed to enter the Faculty of Engineering must be drastically cut, recruiting only the best and brightest. This action will reduce the present glut of engineers and raise the standards and quality of education. Second, the program should be lengthened to result in a master's degree, and the EIT period shortened. When finishing this improved program, graduates should be able to become professional engineers within a year and be able to be self-employed, like doctors and lawyers.

If this results in higher tuition, so be it; the Faculty cannot allow itself to become a glorified community college. If it wants to truly be a professional school, it must start behaving as one.

If the engineering community in Manitoba is too small, and the provincial government too poor to support such an ambitious program, then the Faculty should be shut down and the resources spent on those programs that can give their students a better chance at employment. □

Council Reports

Tuesday, May 12, 1998

By: A.N. Kempas P. Eng. (Ret.)

AT WHICH COUNCIL PONDERES REORGANIZATION, RESIGNATION, AND LEGISLATION

In addition to President Washchysyn, eight councillors attended this meeting. Councillors Britton, Hosang, Olischefski, Pratt, Eddy, Thompson, Roberts, and Ball were in attendance on that fine spring day.

How many times has your company made plans, plans which are forgotten the minute the meeting is over? I like the system the APEM uses for tracking planning initiatives and their progress through the organization. It is the Issues and Activities Bring Forward/Status Report. This is a five or six page document listing task description, assigned to, status, path forward, target date, etc. The Council usually deals with this report first and such was the case that day. The item dealing with Historic Engineering Landmarks was completed and removed from the report.

Routine items followed; adoption of an agenda and minutes of the April meeting. Councillor Hosang asked Executive Director Ennis about Association finances, were they good or bad? Mr. Ennis stated they were fundamentally good, but predicting membership income was difficult.

Dr. Doug Chapman, APEM representative for the Canadian Council of Professional Engineers (CCPE), provided the Council with an update of proposed changes in CCPE governance. It's fair to say the CCPE has had problems with the accountability, independence, and responsibilities pertaining to the Executive Committee. Under the new structure the CCPE would resemble a company with the provincial organizations being the shareholders, and each shareholder having an equal voice. The date for the proposed changes to take effect is November 1998. Council gave approval for Dr. Chapman to ratify the changes.

Councillor Eddy asked about the role of CCPE in the engineering profession. CCPE is not an alternative to provincial associations, but provides a national and international presence to the profession as well as offering member services such as life insurance. Director Ennis added that there was a movement in the Ontario association to withdraw from CCPE, partially motivated by the perceived potential profits from selling financial services now offered by CCPE. Dr. Chapman advised that CCPE is likely to propose a large expenditure for communications which will probably become a hot issue in the future.

It is interesting to note in the proposed CCPE governance document that you cannot serve as a director if you are insolvent, of unsound mind, or dead. We hope none of our members fall into these categories!

Councillor Kramble's chair was empty at this meeting because he has resigned his position. In his relentless climb to the top Councillor Kramble has accepted a position in Saskatoon, in the homeland of our President. Council expressed its appreciation to Councillor Kramble for his considerable contributions to Council and APEM in general. It fell to President Washchysyn to contact individuals to fill the vacant seat from a list of candidates supplied by Council in accordance with APEM procedures. Mr. Kramble had been a member of the Executive Committee also, and in this post he was replaced by Councillor Pratt following a vote by Council.

Most members must be aware by now that mandatory professional development is coming to APEM. At this meeting Messrs Bruce, Turanli, and Jackson, of the PD Committee, appeared to report on the MPDP Pilot Project. Their feeling was that many people opposed to mandatory professional development were won over when they learned more about it. Members found that in many cases their normal work-life provided ample material to fulfill the requirements. The visitors felt that it was important to publish details of the MPDP on the Web as soon as possible so that members could examine it in detail. This led to a discussion of the slow development of the APEM's web pages and what could be done to expedite this activity.

Manitoba engineers and geoscientists are closer to having a new act. Executive Director Ennis informed Council that The Engineering and Geoscientific Professions Act, known as Bill 54, received first reading in the Manitoba legislature on May 11, 1998. President Washchysyn advised that second reading could also take place in May, and that it would likely pass without debate.

Council got a taste of the legal world when they received a 51-page document written by The Honourable Associate Chief Judge Bruce H. Miller outlining his reasons for the decision involving the prosecution of John Denoon, P. Eng., under The Architects Act. The judge found that Mr. Denoon did not contravene The Architects Act.

Finally, Council received some sombre news from Councillor Britton, who reported that The Faculty Council at the University of Manitoba had proposed that enrollment be limited to what could be supported by available funding. The practical effect of this would be to reduce the number of engineering graduates at the U of M. □

Tuesday, June 8, 1998

By: A.N. Kempas P. Eng. (Ret.)

AT WHICH COUNCIL GETS LETTERS REGARDING THE NEW ACT

Attendance for the June meeting was somewhat sparse, probably a random conjunction of overloaded appointment books. Council lost a member at the last meeting with the resignation of Councillor Kramble, but that loss was made good with the introduction of a new member of Council. President Washchysyn appointed Mr. John McLeod of the Kelsey chapter to serve the remainder of Mr. Kramble's term.

The meeting began with routine items: issues and activities, adoption of an agenda, and minutes. President Washchysyn expanded on developments regarding enrollment limitations at the University of Manitoba. The Faculty Council proposal to limit enrollment to funding levels had been approved and forwarded to the University of Manitoba Senate. President Washchysyn said that Manitoba Hydro had examined the implications of limited enrollment, and the subsequent reduction in graduates, and concluded that they would have problems filling their requirements for new engineers. In addition to this, many engineers are leaving the province for lucrative jobs in Alberta.

Executive Director Dave Ennis briefed Council on the progress of The Engineering and Geoscientific Professions Act through the Legislature. The Act has received second reading. Mr. Ennis shared with Council two letters

received regarding the new Act. One was a poison-pen fax. The second page was missing so the sender could not be identified. The second was sent to Mr. Washchysyn from a disgruntled geoscientist who slammed the APEM for its motives in merging with the geoscientists.

Don Spangelo, Chair of the Legislation Committee, briefed Council on the progress of our memorandum of understanding with the Manitoba Association of Landscape Architects (MALA). MALA states that they will support The Engineering and Geoscientific Professions Act only if the proposed MOU with their organization is ratified. They felt that agreement was possible and probable. The MOU supports the concept of right-to-title legislation for landscape architects and provides for a joint committee to resolve issues.

At the last meeting of Council the members decided to table approval of the Mandatory Professional Development Program Pilot Project report in order that councillors could review it. Having done this, Council approved the report and its recommendations. Implementation of MPDP requires a change to the APEM's bylaws. A draft version of the new bylaw exists and must be finalized by September so it can be ready for the Annual General Meeting in October. That is when APEM membership will vote on the MPDP proposal. Don't miss it!

In May, Dr. Doug Chapman attended the Annual General Meeting of the Canadian Council of Professional Engineers (CCPE) in Vancouver. He reported to Council on the discussions there. The major item in Vancouver was the proposed change in governance designed to improve the workings of

1998 Spring Golf Tournament

By: M. Baril, EIT (APEM Sports Committee Member)

This year's tournament was once again held at Quarry Oaks. We had the opportunity to play the new Desert Nine, opened only a week before we arrived. The various comments heard about this new experience ranged from frustrated expletives to high praise. This year's tournament was void of the "string" controversy, however, the first five or six holes were played in a steady drizzle, before the skies began to clear, allowing the final five or six to be played in warming temperatures and sunshine. The winning team of Dave Krahn, Carl Wiebe, Lance Vigfusson and Bruce McPhail finished with a round of ten under par (-10). Second place was decided by a count back as three teams finished at 8 under

par (-8). Second place was finally awarded to the team of Julien Lavergne, Brad Draward, Allan Copping and Michael Flynn.

The President's message at the dinner was given by Past-President Mal Symonds, as current President Peter Washchysyn was unable to attend. The address was followed by the serious business of eating and the award of prizes.

Once again, the tournament was a well attended (39 teams, 156 golfers), fun filled afternoon and evening of golf, food and drink, and social networking, not necessarily in that order. We hope to see many of you again in the Fall for the "semi-annual" Fall Golf Tournament. □



Past-President Mal Symonds (r) presents trophy to 1st place team.

Notice Under the Discipline By-Law

This is Notice that on July 3, 1998, the registration of Percival A.A.R. Beach, P.Eng. to practice engineering in the Province of Manitoba was suspended for a period of three months following a conviction on a charge of unprofessional conduct in the practice of engineering, and conduct in the practice of engineering detrimental to the public interest, in accordance with Section 43.4.8(e) of the By-Laws of the Association of Professional Engineers of the Province of Manitoba.

The conviction is based upon his failure to take care to adequately identify the structural condition of a residence, his failure to advise the owner of the nature and extent of the maintenance normally associated with the type of construction of which the residence was built, and his reporting in such a way as to give the owner a false sense of the durability and structural condition of the residence, thereby failing to satisfy the engineering needs of his clients in a professional manner.

Publication of this Notice is made under the discretionary authority provided in the Associations' Discipline By-Law.

D.A. Ennis, P.Eng.
Registrar

William R. Sutherland, P.Eng., elected as new Chair of the Canadian Council of Professional Engineers

The Canadian Council of Professional Engineers (CCPE) elected Mr. William R. Sutherland, P.Eng., as Chair of the Board at its 62nd Annual General Meeting held May 20-23, 1998, in Vancouver, British Columbia. Mr. Sutherland replaces Pierre Desjardins, ing., who has completed his term of office.

Mr. Sutherland's incoming address pledged that national and international professional mobility issues for Canadian engineers will figure prominently in CCPE's upcoming agenda. "Development of mutual recognition agreements with other countries will go a long way towards achieving recognition of Canadian engineering practice standards and remove barriers to international practice for Canadian engineers". He stressed that the CCPE, which is responsible for the accreditation of undergraduate engineering programs in Canada, is positioned to develop academic guidelines for Canadian universities offer-

ing engineering programs. "The engineering profession is charged with the continued protection of the public and the natural environment and therefore have a significant role to play to ensure that graduate engineers have received the appropriate training to meet emerging demands."

Mr. Sutherland is a former President of the Association of Professional Engineers of Nova Scotia and the Nova Scotia Consulting Engineers Association. He is a civil engineer with extensive experience in management and design associated with marine, geotechnical and environmental projects. Since 1978, he has been a Vice President and Director of Jacques Whitford, a multidisciplinary firm of consulting engineers and environmental scientists. With its corporate office in Dartmouth, Nova Scotia, Jacques Whitford has 16 branch offices across Canada, four in the north-eastern United States and international joint ventures in Moscow, Buenos Aires and Trinidad. □



CCPE Chair, William Sutherland

Industry Canada no Longer Involved in National Science and Technology Week

A message from Industry Canada

Since the establishment of National Science and Technology Week in 1990, Industry Canada has played the role of National Coordinator for the Week. The Week was successful due to the support and collaboration of all provincial/territorial governments, the private sector, scientific and engineering societies, educational institutions and science centres.

Unfortunately, due to budget constraints, Industry Canada can no longer undertake this role. Thus, its involvement in National Science and Technology Week is being ended, other than participating in selected events.

Industry Canada has provided its partners and other stakeholders the tools to continue the important task of reaching young Canadians and with the opportunity to gain a better understanding of science, technology, engineering and mathematics and their relevance to Canada's economic prosperity and quality of life. Industry Canada is confident that National Science and Technology Week will continue as a national celebration,

since the number of organizations participating has grown substantially in recent years.

Thank you for your strong support of National Science and Technology Week and related science-promotion initiatives. We do feel that it has been a great success and we are very proud of what has been accomplished over the past eight years.

We would like to inform you that the current "Explore" listserver will remain active and we encourage your continued use of this communication tool to monitor any new developments with regard to NSTW by other partner organizations, and to communicate with each other concerning endeavours to promote science and technology to Canadians.

If you have any questions concerning National Science and Technology Week, please contact Mary Marshall-Gardiner, Manager, Promotion and Marketing by e-mail at marshallgardiner.mary@ic.gc.ca or by telephone at (613) 993-4715. □

Recent Developments in Environmental Law in Manitoba

By: M.J. Styczen, P.Eng., (of the law firm Aikins, MacAulay & Thorvaldson)

Engineers working in environmental protection and regulation in Manitoba should be aware of several changes to the law.

A recent decision of the Supreme Court of Canada signaled the importance of enforcement of environmental regulation in Canada. In the *Hydro-Quebec* case, the Court used remarkably strong language to uphold portions of the Canadian Environmental Protection Act. The court compared pollution to criminal activity, thus allowing the Federal Government to regulate and prohibit it. In its reasons, the court highlighted the importance of environmental law when it stated that:

The protection of the environment has become one of the major challenges of our time. To respond to this challenge, governments and international organizations have been engaged in the creation of a wide variety of legislative schemes and administrative structures.

...a fundamental and widely shared value is indeed seriously contravened by some environmental pollution, a value which we will refer to as the right to a safe environment.

Stewardship of the environment is a fundamental value of our society and Parliament may use its criminal law power to underline that value.

The Government of Manitoba has recently enacted three laws which will have an impact on



environmental regulation in the province.

The Sustainable Development Act, which has been passed but has not yet come into force, requires that the provincial public sector consider the principles of sustainable development in all of its decision making. The Act covers the entire provincial public sector, including the provincial government, municipalities, Crown corporations and school divisions. The Act requires the Government to develop sustainable development policies and purchasing guidelines, which must be followed by all of those agencies. The main impact on the private sector will be indirect, in that suppliers and contractors to government will

Council Report, June 8, 1998

Continued from Page 10

CCPE. Mr. Chapman said the changes had been approved, but that the Ontario association abstained from the vote. It appears that PEO is determined to take a contrary position on anything relating to CCPE. Another hot item in Vancouver was the proposed communications budget for CCPE. It is estimated that it will require over a million dollars by 2001. Improved communications are needed, but many feel that it can be done for much less money.

The movement to free trade and free movement of capital has created the need for mobility in the engineering profession. One of the tasks of CCPE has been to draft an Inter-Association Mobility Agreement. This agreement appeared before Council at this meeting. Executive Director Ennis outlined the position taken by APEM, which feels that the idea is good, but that there are deficiencies. Under the proposed agreement an applicant would need zero years of experience to transfer to another jurisdiction. This is in conflict with experience requirements of the APEM. Director of Admissions Shirley Matile provided an outline of registration requirements in various provinces. These requirements vary widely. Mr. Chapman stated that the bylaws of our association should prevail in cases like this.

The meeting concluded with a presentation to Council from a special guest, Dr. Kinsner. He has been busy developing a Web site for APEM. Dr. Kinsner has devoted 400 hours to this endeavour. With the help of a clever projection device he showed Council the results of his labours. The results were impressive. It's amazing what you can do with an Apple computer these days. □

have to meet the new government purchasing guidelines. The Act as passed by the Legislature was changed significantly from the draft Act that was circulated in 1995, most importantly in that the imposition of sustainable development guidelines on **The Environment Act** planning and approvals process has been removed.

The Environmental Cooperation Act came into force in October. This Act implements an environmental "side deal" to NAFTA, essentially requiring governments to enforce their existing environmental laws. The member states of NAFTA have set up an independent commission headquartered at Montreal, which investigates complaints from the public or from other governments that member states of NAFTA have not been enforcing their environmental laws. If the commission finds that laws are not being enforced by a government, it may make an order that can be enforced by local courts against that government.

There is no requirement that a complaint come from a competing NAFTA jurisdiction. For example, a Manitoban may complain that Manitoba Environment is not enforcing water pollution laws against the factory at the end of his street.

Continued on page 12

Women in the Workplace – Achieving Harmony

(May 21-23, 1998)

By: B.A.K. Danielson, P.Eng.

Vancouver, B.C., was the location of the 1998 “Women in the Workplace – Achieving Harmony” conference. This conference was an opportunity for engineers, scientists, technologists, and mathematicians to come together to:

- discuss issues affecting women in our professions;
- discuss projects to promote our professions to society;
- develop professional skills; and
- form business and support networks.

The conference focused on the lives of women in science, technology, engineering, and mathematical (STEM) careers. It has been well established that many people, both women and men, have yet to find a balance in their lives between exciting and demanding careers and their personal/family responsibilities. Unfortunately for some, the juggling act has been too much and they have either voluntarily or involuntarily left STEM careers. The problem may be a matter of achieving a culture in STEM careers which allows women and men the flexibility to achieve this balance in their lives. Finding a successful solution to this problem will be of benefit to everyone – to women starting out and continuing on in STEM careers, to employers who want more productivity and efficiency in their organi-

zations, and to all of us who want more balance between our personal and professional lives.

The conference featured many interesting speakers. Among them were the Honourable Dr. Hedy Fry, P.C., M.P., Secretary of State (Status of Women) who compared the difficulties faced by women in politics to those of women in STEM, and Dr. Martha Piper, President and Vice-Chancellor, University of British Columbia, who gave an inspiring address describing how she achieves harmony in her busy life and some of the women who have provided inspiration to her.

Another prominent feature of the conference was presentations by the five regional NSERC Chairs from across Canada who have been appointed to study women in science and engineering.

- Dr. Maria Klawe (NSERC/IBM Chair – BC/Yukon) explained that the focus in the BC/Yukon region is to significantly increase the participation of women in information-technology careers. Three initiatives underway are: a survey of students’ attitudes toward different subject areas and information-technology careers; a new post-baccalaureate university-industry program to give individuals without previous programming experience a rapid path into the information-technology field; and research into the design of “girl-friendly” educational computer games.

- Dr. Elizabeth Cannon (NSERC/Petro-Canada Chair – Prairie Region) gave an overview of the pipeline model that is being used to represent the participation of women in science and engineering, from high school through to university and on into the workplace. Key leaks (representing major reasons why women either don’t enter science/engineering professions or end up leaving them) have been identified and activities underway to tackle them have been designed to encompass three broad areas: 1) public awareness, 2) data acquisition and research, and 3) program development.

- Dr. Monique Frize (NSERC/Nortel Chair – Ontario) described the following strategies currently underway in the Ottawa/Carleton region: school presentations (Pathmakers), workplace presentations (WISE – Ottawa), parent/teacher/guidance counsellor presentations, and mentoring programs.

- Dr. Claire Deschênes (NSERC/Alcan Chair – Quebec) described activities in Quebec and action-plans that have been developed. More specifically, these programs are designed to: reinforce confidence, value intuition, promote awareness of double standards, promote gender-inclusive language, and de-mystify science.

- Dr. Mary Williams (NSERC/Petro-Canada Chair – Atlantic Region) outlined a set of three strategies that are guidelines for plans, actions, and evaluations. The following three strategies were illustrated by outlining projects and plans in the Atlantic region: guidance (through leadership), propulsion (through motivation, i.e. local support groups), and

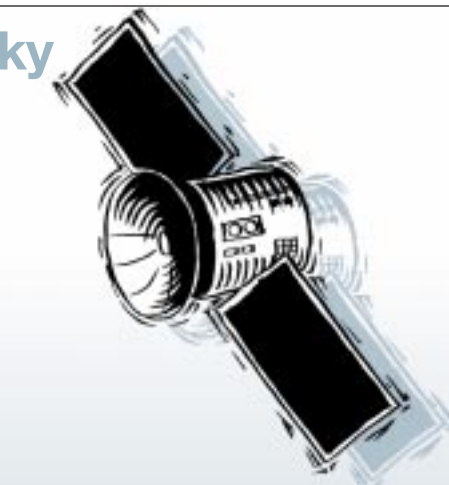
Continued on page 12

Bent Pipes in the Sky

By: D.R. Strang, P.Eng.

A bent pipe is perhaps the simplest way of looking at the function provided by a communications satellite. Although the satellites themselves are very complex devices, Dr. Moe Barakat brought the technology “down to earth” in a recent luncheon presentation.

The occasion was the May 21 luncheon meeting sponsored by the Emerging Technologies Committee. Dr. Barakat, president of Winnipeg-based InfoMagnetics Technologies Corporation, provided a structured overview of “Developments and Applications in Wireless Communication”. He began the presentation by reviewing some of the developments since the term “bent pipe in the Sky” was coined in 1958 to describe the function of a communications link that featured an uplink from one terrestrial location, a bend (the satellite itself), and a downlink to another location. At that time, there was no consideration of processing the signal on board the satellite. Developments in the field of satellite communication, however, have changed the approach to the point where a satellite may be able to selectively transmit information to a



specific location depending on the source and/or content of the information.

There is now so much activity in the satellite communications field that, according to Dr. Barakat, constellations of satellites are being placed in layers of orbits with names such as LEO, MEO and GEO (low earth orbit, medium earth orbit and geostationary orbit, respectively). There is also a push to compress more and more signal into the available bandwidth with techniques such as digitization, circuit switching,

packet switching, and asynchronous transfer. While access techniques such as frequency division multiple access (FDMA), time division multiple access (TDMA), and code division multiple access (CDMA) have all been successfully used, Dr. Barakat was of the view that the future lies in a hybrid of these techniques called demand assignment multiple access (DAMA).

But, what is the utility of all of this advancing technology? Dr. Barakat provided an answer to that by listing some of the existing and planned satellite-based communications services. Existing services include rural telephone, very small aperture terminal systems, data broadcasting, Internet data transmission, and mobile satellite systems. Planned services include satellite-based wireless personal communications systems (PCS) for worldwide voice, data, fax, and paging. Trends include higher frequencies, high powers, larger bandwidths and the use of more “directional” phased array antennas to direct beams of information to selected locations.

It becomes apparent when you listen to Dr. Barakat talk that we have come a long way since that first “bent pipe” appeared in the sky 40 years ago. □

Correspondents Wanted

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

This Association's Communications Committee is seeking volunteers for writing assignments for *The Manitoba Professional Engineer*. If you are interested in having your name included in a list of potential "correspondents", please call, fax, or e-mail the office with your name, current address, telephone number, fax number, and e-mail address.

Assignments may include write-ups on APEM meetings and events, or articles on specific topics.

Note: EITs participating in this activity will earn one-half a professional service point for each article accepted.

Canada's Communication Centre

Source: *Quebec Science*, Sept. 97, translated by V.L. Dutton, P.Eng. (Ret.)

Last April, when most Winnipeggers were worrying about sandbags and dykes, the technicians at Telelobe Canada, in Montreal, found that they suddenly had an under-water cable in the middle of their network. One of the two fibre-optic cables that tie this country together had failed. "For two weeks the entire network hung together on a single 'wire'."

Telelobe has had lots of experience with under-water cables as they are responsible for all submarine and satellite connections between Canada and 200 countries around the world.

Telelobe is the nerve centre of Canada's communications system with six switching centres, two terminals for the submarine cables, and three radar stations. At present, it handles two billion minutes of international calls per year. By 2001, they expect to have 40 satellites in service. □

A Profession Not in Demand

Continued from Page 7

and increase incomes. Examples include BC doctors going on strike, both Manitoba nurses and teachers hammering at the government over working conditions and cut-backs, Ontario teachers going on strike, Manitoba lawyers lobbying against no-fault insurance legislation (an indirect threat to their income), etc. When was the last time you heard anything in the news about engineers standing up for their profession?

While I'm certainly not advocating the formation of a union or the running of television commercials, I do believe we need to do something. We must think about where we are as a profession and where we want to be in 10 or 20 years. An objective self-examination from a business standpoint would be the healthy first step that is needed for the long-term viability and performance of our profession. □

Women in the Workplace – Achieving Harmony

Continued from Page 11

road-block response (through development of new paths, i.e. changed traditions).

One of the main sponsors of this conference with which APEM's WEAC is involved was the Canadian Coalition of Women in Engineering, Science, and Technology (CCWEST). CCWEST is a national coalition of groups that promotes women in science, technology, engineering, and math, celebrates their contributions, and applies new vision to these fields. The objectives of CCWEST are:

1. To develop and maintain a resource-and-support network to facilitate the exchange of information amongst member organizations.
2. To promote the full participation of women in science, engineering, math, and technology to government, business and industry, and educational institutions.
3. To research, measure, evaluate, and disseminate information on the integration of women in science, engineering, technology, and math at all levels.

CCWEST maintains a website which includes information about all of the members and brief descriptions of the activities of each group at <http://www.cwest.org>. □

Environmental Law in Manitoba

Continued from Page 7

Several complaints have already been made against Canadian provincial governments, none of which has yet been resolved by the Commission. As long as Manitoba Environment is enforcing and continues to enforce environmental laws in the province, this new Act should have little effect.

The Act which will have the greatest effect on industry in Manitoba is the **Contaminated Sites Remediation Act**, which came into force in May. The Act replaces the existing system of issuing cleanup orders in the province. If Manitoba Environment believes that contamination of a site poses a danger to health, safety or the environment, it may order the owner or occupier to perform a site assessment, or it may order the site cleaned up. The Act does not address contamination that is merely aesthetic or that only affects property value.

Once a site is designated as contaminated by Manitoba Environment, it must identify the persons it believes to be responsible for the contamination (for example, owners, occupiers, former owners). The Act then provides for mediation and, ultimately, arbitration to decide who amongst those named is actually responsible, and what proportion of the cost of the cleanup each should bear based on the principle of "polluter pays". The impact of this Act will depend for the most part on how vigorous the Department intends to be on designating sites as contaminated and issuing orders; as of December, five sites have been designated "contaminated" and no cleanup orders have been issued. □

Citations

R. v Hydro-Quebec, not yet reported, September 18, 1997 (S.C.C.)

Canadian Environmental Protection Act, R.S.C. 1985 (4th Supp.) c. C-16

The Sustainable Development Act, C.C.S.M. c. S270

The North American Environmental and Labour Cooperation Agreements Implementation Act, C.C.S.M. c. N95

The Contaminated Sites Remediation Act, C.C.S.M. c. C205

1950 Class Reunion

The largest class, to date, of engineers from the University of Manitoba is holding a reunion in the fall of 2000.

It would be very much appreciated if engineers currently practicing would inform retired engineers, whom they may know, about this event. For more information please contact George Lawlor, P.Eng., 163 Kingston Row, Winnipeg, Manitoba R2M 0T1 or phone 231-0160. □

VISION

APEM VISION

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