

Professional Engineer



Professional Development

H.V.D.C. for Breakfast

By: L.Y. Ganetsky, P.Eng.

Your Professional Development Committee organized yet another interesting and well-attended breakfast meeting. The topic was the Manitoba Hydro H.V.D.C. (high-voltage, direct current) transmission line failure and it was presented by Mr. Ian McKay, P.Eng. and Dr. Mohamed Rashwan, P.Eng.

The meeting was held at the Norwood Hotel on December 11, 1996. They had a sell-out crowd of 105 attendees and I believe there were even more lined up at the door hoping for no-shows.

The two speakers shared the podium with a Manitoba Hydro professionally produced video that told most of the details of the story. Mr. McKay, a Division Manager of H.V.D.C. with Manitoba Hydro, began the presentation by summarizing the events surrounding the transmission-line failure. The story began with the storm on September 5, 1996, the damage it created, and the record time in which Manitoba Hydro crews got the H.V.D.C. lines up and working again. He shared with us some of the lessons learned from the Hydro team. The lesson that stuck with me was the best thing management could and did do was to minimize the bureaucracy and let the people do their jobs.

The video was then shown, and it ran for about 30 minutes. It detailed the power of the storm, the path it took, and the damage it did to Bipole I and Bipole II.

Bipole I and Bipole II are the two H.V.D.C. transmission lines that carry over 70% of Manitoba Hydro's generation capacity. These two lines, stretching over 900 km, bring electricity from the Nelson River Hydro-electric generating stations in northern Manitoba to the Dorsey converter station in southern Manitoba.

The storm caused the collapse of a total of 19 towers just north of the Dorsey station: ten on one line, and nine on the other. Details of the actual tower failure mechanisms can be found in a second article on the subject in this publication.

When the crews arrived on the scene, they assessed the damage and went to work putting in place a plan to restore the link to northern Manitoba power. Realizing that they did not have enough steel towers in stock, they decided to rebuild Bipole I immediately with temporary wood poles. They followed that with the reconstruction of steel towers for Bipole II in the next few days.



During the crisis, Hydro had to import power over lines that are normally used to export power to the USA. Hydro also had to import power from both neighboring provinces. Power generation from the Winnipeg River, as well as from Brandon and Selkirk, also had to be brought on line ahead of schedule to handle the load. A public appeal also went out to residents and businesses in the city of Winnipeg to reduce consumption.

Continued on page 4

National
Engineering
Week

'97

NEW People Wanted

Preparations for National Engineering Week (NEW), March 5-9, 1997, continue. As with any large endeavour undertaken solely by volunteers, extra helping hands are always appreciated. In particular, individuals willing to give approximately three hours of their time during NEW to staff a display area in Polo Park Mall are being sought. Any P.Eng. or EIT is welcome. Retired members willing to share their engineering experiences with the general public are particularly asked to help.

In a related area, individuals or businesses willing to give or lend materials for the display area are also being sought. The desired material includes promotional information (brochures, posters, etc.), tangible items (final products or parts) or VHS videotapes.

If you wish to volunteer your time, or provide display materials please contact Richard Bernhardt at 788-2969 or Caroline Nieuwenburg at 474-3178. □

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R. Menon, P. Eng., Brandon

Opinions expressed are not necessarily those held by the APEM or the Council of the APEM.



In Memoriam

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

Joseph W.E. Brako
Frank M. Fowler
Michael R. Hawrysh
Harold J. Neumann
Michael H. Sawka
Harold Wilson

Engineers in the News

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

Bill Brant, P. Eng., was inducted as the 1996-97 President of the Western Canada Water and Wastewater Association in Regina.

Mr. Brant, a 1973 University of Manitoba Civil Engineering graduate who has specialized in water supply and treatment, has been a senior group manager with Cochrane Engineering's Winnipeg office for 15 years.

NEW MEMBERS REGISTERED NOVEMBER & DECEMBER, 1996

K.M. Blaquiére	T.R.J. Ouellette
R. Chen	M.M. Perreault (PQ)
I.R. Fleming (ON)	M.N. Robson
B.F. Goren	P.W. Shapton (ON)
G.B. Halverson	C.A. Smith (ON)
L. Korenbaum	V. Turek (ON)
I. Le May (SK)	P.R. Van Arnhem (ON)
P. Lhotsky (PQ)	R.G. Wakelin (ON)
P.L. Majer	

LICENCES ISSUED NOVEMBER & DECEMBER, 1996

A.A. Altaee (ON)	P.B. Kulkarni (TX)
J.A. Axelson (WI)	G.V. Nagel (MN)
J.E. Burson (TX)	R.G. Skrentner (MN)
R. Gold (ON)	

EITs ENROLLED NOVEMBER & DECEMBER, 1996

A.R. Adams	P.J. Isaak
W.T. Anderson	R.F. Kroeker
S.J. Baker	D.W. Mauthe
J.V. Boblinski	D.J. Mizak
G.V. Boddy	M.A. Nagle
M. Brown	Z. Siveski
R. Furletti	P.J. Skiba
W.C. Hillman	I.S. Smart
W.S. Inkpen	J.I. Strongman

REINSTATEMENTS NOVEMBER & DECEMBER, 1996

F.L.J. Berard	R.A. Riesz
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WE HAVE LOST CONTACT. MAY WE HAVE AN ADDRESS?



S.S. Attawar	J.A. Longbottom
M.L. Ayari	G.D. Marshall
M.D. Chekki, EIT	G.D.M. Michalishen,
S.D. Davies	EIT
G.M. Fagerstron	D.H. Robinson
A. Festa-Bianchet	C.B. Saunders
T.H. Higgins	R.W. Smith
A.J. Kondel	D.A. Stewart
C.M. Legrange	M.L. Zahn

Dr. Quang Zhang, P.Eng., of the University of Manitoba's Department of Bio-Systems Engineering, has been named an honorary professor of the National Bio-Environment Engineering Laboratory of the Ministry of Agriculture of the People's Republic of China.

The award recognizes Dr. Zhang's long-standing collaboration with the University, with whom he continues to work on such agricultural engineering projects as environmental control systems for confined-livestock production. □

TRANSFERS OUT DECEMBER 31, 1996

D.R. Whitehouse

RESIGNATIONS DECEMBER 31, 1996

A.J. Ament	D.C. Longfield
D.E. Anderson	D.D. McCormac
H.M. Armstrong	W. Mcgilvery
D.S. Austen	M.J. McMullin
J.L. Babletek	J. W. Maclaren
F.A. Baker	A. K. Mattick
F.R. Berry	G. D. Michalishen
W. Bilozer	R.W. Molinski
K.G. Blakely	D.K. Newey
L.B. Brekstad	P.V. Nguyen
J.H. Brown	S.A. Otorowski
R.W. Bruynson	K.R. Ouelette
K. Buban	J. Pawelkiewicz
B.F. Burke	L.P. Pelletier
H.H. Bush	R. C. Petersen
W.A. Collier	V.R.D. Price
N.S. Crawford	G.A. Rae
R.J. Dahnke	L.D. Rehaluk
W.P. Dawson	W.S. Robertson
T.E. Douglass	W.B. Ross
T.K. Eng	B.J. Ruzsicska
T.J. Erskine	J.R.S. Sadler
G.E. Gesner	G.K. Saevil
J. Goldschmied	D.O. Scott
B.A. Gordon	J.D. Seekings
A.G. Grant	I. Shore
P.J. Haddon	C.P.S. Simonsen
M.G. Hammond	M.P. Smith
G.P. Hawley	D.H. Solmundson
R.J. Heidebrecht	Q. Sun
M. Hirt	P.M. Thorp
A.D. Huffman	D. Torbiak
R.H. Hummel	G. Trachilis
T.C.W. Ip	R.M. Vannevel
R.B. Jackson	T.M. Vardy
O.T.F. Kan	D.L. Verhelst
R.K. Kaushal	S.J. Weslake
K.Y. Kim	E. Wistow
G.R. Kirk	

EIT RESIGNATIONS DECEMBER 31, 1996

K.D. Barlishen	K.W. Ising
T.P. Brophy	E.A. Lacroix
N.G. Domenico	S.R. Roberts
K.Y.D. Fan	R.M. Sandilands
L. Gosselin	

President's Message

J.M. Symonds,
P.Eng.



Building the Engineering Team for the Future

I am writing this just before Christmas in order to meet the Publication Committee's and printer's deadlines. It is perhaps appropriate that, since I want to discuss our recent talks and agreements with the Certified Technicians and Technologists Association of Manitoba (CTTAM), I do the writing at a time when peace and co-operation are foremost in everyone's minds.

First, a little history. The Manitoba Law Reform Commission was assigned the task of providing recommendations on the regulation of professions and occupations. To a certain extent, this resulted from inconclusive discussions between the APEM and the Manitoba Society of Certified Technologists and Technicians (MAN-SCETT) – the former name of CTTAM. The issue then was the proposal for the independent creation and enactment of a separate "technologist and technician act". Due to a probable misunderstanding of the reasons and direction for this initiative, the APEM opposed this action up to and at the political level. Since the Law Reform Commission report, the APEM has been working toward a revised Engineering Profession Act. In parallel to this, there has been a growing level of agreement between the two associations, culminating in a Memorandum of Understanding (MOU) that sets out a framework for mutual support of the currently proposed Acts of both associations and for future co-operation.

A sub-committee of your Council was set up in early 1996 to negotiate an agreement. After several meetings, it concluded an MOU with CTTAM on October 8, 1996. The committee was headed by Barry MacBride, Chair of the Legislation Committee, and supported by Cathy Stewart, Dave Ennis, and me.

The essence of the MOU is fundamental and basic. It is simply a recognition that both groups exist, that each will support the other's Act as it is presented to the government, and that we will work together to develop common goals and areas of interest. Specifically, we have mutually agreed:

- to the present content of the other's Act as it now stands,
- to consult on any changes to either Act,
- to establish a Joint Board to assist in resolving disputes and defining occupations,

- to establish working groups to consider areas of mutual interest, and
- to encourage co-operation on a national level to clarify the relationship between engineers and technologists, including the relative education issues.

At present, nothing in this agreement changes the status quo at any level of the engineer/technologist work continuum. Nothing has been changed with respect to the responsibility of the APEM to protect the public from engineering malpractice under our Act, and no changes are intended.

It should be recognized, however, that the CTTAM has prepared and is submitting an Act for consideration by the Manitoba Legislature. This is a "right-to-title" act which in no way is intended to regulate the practice of professional engineering. That will remain the sole purview of "The Engineering and Geoscientific Professions Act" through the APEM.

"One of the major problems facing us...is the definition of Professional Engineering. While we have adopted the CCPE definition, it does little to specify the exact bounds between Engineering and any of the other technical occupations."

The signing of the MOU has caused much debate among the engineering and technologist communities across Canada. At the last Canadian Council of Professional Engineers (CCPE) Directors' meeting in Ottawa, there was both consternation over and support for our actions. The

consternation was from constituencies that were having problems dealing with their own relationships between engineers and technologists. They also felt that we should have consulted with them before signing and releasing our MOU. Some of the organizations were using our MOU for their own political objectives outside of the intent and purpose of our understanding. Other provincial organizations were very supportive of our right to self-determination and of our co-operative direction. We are essentially one of the leading provinces in our relationship between engineers, technologists, and technicians.

There is, however, one issue concerning the CTTAM Act that has received much attention across the country from other engineering organizations. It concerns the definition of the "occupation of applied science technology". This term is defined as "providing services by Certified Applied Science Technologists or Certified Applied Science Technicians...in accordance with generally accepted practices and procedures within nationally accepted codes and standards **exclusive** of the practice of Professional Engineering or Professional Geoscience as defined in The Engineering and Geoscience Professions Act...". Since this can be interpreted as both including technologists and technicians in, or excluding them from, Professional Engineering, some ambiguity exists. Talks are underway with CTTAM to resolve this problem, and we hope to have a definitive interpretation soon.

One of the major problems facing us, however, is the definition of Professional Engineering. While we have adopted the CCPE definition, it does little to specify the exact bounds between Engineering and any of the other technical occupations. As a result, we must continue to apply the test of the protection of the public interest to any discussions, and maintain the present stance on enforcement.

Continued on page 7

Meet Your New Council – 1996-97



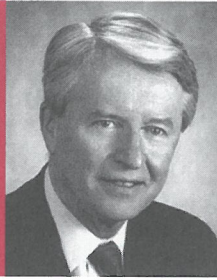
Back Row (from left): Kelly Olischefski, Don Spangelo, Cathy Stewart, Kathy Pratt, Ron Britton, Vice-President Peter Washchyshyn, Doug Kramble, Joe Lucas.

Seated (from left): Bonnie Thomson, Brian Stimpson, President Mal Symonds, Carol Roberts.

Missing: Ertrice Eddy.

CCPE Chair of the Board's Message

J. Bate, P.Eng.



Visions

"Where there is no vision, the people perish"
Proverbs 29:18

I firmly believe that the most important element of a successful life is the ability to see clearly where one is going and to plan carefully how to get there. When you set off on a trip, you know where you are going and how you are going to get there. In other words, you have a "vision" of the journey in your mind.

Professional motivators who preach on how to organize our lives and careers tell of the importance of setting short-, medium-, and long-term goals, putting them down in writing and preparing a plan to achieve them. We are told to believe in the power of goals.

So it is with business ventures. Without goals and a plan, any business will most certainly fail or, at best, flounder.

By training, engineers are planners and visionaries. Projects begin as concepts in the minds of

engineers before the pencil hits the paper (or, more appropriately these days, before the finger hits the mouse). Concepts are then refined on paper before being translated into working drawings. Engineers know well in advance what the finished project will look like, how it will work, how much it will cost and what the expected yield on the investment is. A recently circulated paper by Dr. Gordon Slemon¹ makes the point that at the heart of engineering stands the ability to predict.

With the CCPE acting as facilitator, the profession has taken on the challenge of putting together the elements of a Vision of the engineering profession and designing the plans that will guide us in achieving it. I seize this opportunity to put forward my personal Vision of our profession.

I see Canada as a strong, debt-free country; a world leader in industry, construction, education, power generation and high technology. I see Canada as an international exporter of goods and services renowned for their excellence and value. Only through massive private investment in new production facilities and infrastructure at home, and expansion of export markets, will Canadians have the tax base upon which to rebuild the nation's wealth. In this context, the talents of Canadian engineers, scientists, technicians and technologists could achieve their greatest potential.

I see legions of bright students progressing through a revitalized education system, pursuing engineering and scientific studies in our universities. I see our engineering schools staffed with well-paid, high-calibre professionals instructing

and inspiring our young people in facilities equipped with the very latest in teaching aids. I see a strong, constructive partnership between government and industry contributing to the experience of each other and faculty and students alike. I see a strong contingent of engineers working in every part of Canada and around the world, ever mindful of the legacy of those who preceded them. I see them excited upon reviewing designs which have sprung from their talent and collaboration with other professionals and their materialization into buildings, dams, computer networks, industrial plants, etc.

These are only some of my dreams and, I am certain, those of most CCPE volunteer leaders who spend countless hours working on behalf of their colleagues everywhere, supported by an awareness that they are moving us that much closer to achievement of our common Vision. □

¹Slemon, Gordon R. *The Profession of Engineering in Canada – A Personal Perspective*, August, 1996.

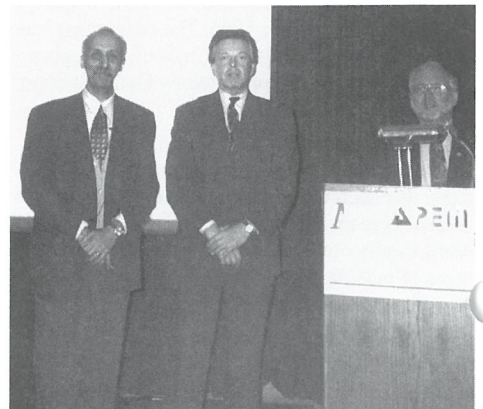
H.V.D.C. For Breakfast

(Cont'd from page 1)

The storm and five-day outage cost Hydro \$3.34 million in lost export revenue and \$2.56 million to import power. Including the cost of Hydro repairs, the total cost of the crisis will reach \$10 million.

Dr. Mohamed Rashwan, manager of H.V.D.C. Engineering, wrapped up the presentation, describing the paralleling scheme of the two Bipole transmission systems. This scheme allows them to switch power to either Bipole when the other is unavailable. This technique was used when Bipole 1 on wooden towers was energized. It allowed Hydro to transmit all the needed power on a single Bipole II. This technique was used again on the Thanksgiving weekend, when Hydro switched off the wooden pole line to substitute back the permanent steel towers.

In total, Hydro was without its northern generation for only five days. The people of Winnipeg only knew of the problem through the media. No power outages were experienced in Winnipeg: an amazing accomplishment for the crews at Manitoba Hydro. They are to be commended. □



Speakers Mohamed Rashwan (l) and Ian McKay with emcee Kelly Kjartanson.

Dorval – The Last Chance

By: V.L. Dutton, P.Eng. (Ret.) (Based on an article which appeared in "Plan", the newsletter of the Ordre des Ingenieurs de Québec, Aug./Sept. 1996)

"Montreal cannot support two airports. Mirabel operates at a capacity of 35%, Dorval at 60%. If these were two factories, one would have been closed years ago." So says Pierre Louis Gauthier, ing., Chairman of the Technical Committee set up by the Quebec Order of Engineers to prepare the Order's position-paper on Montreal's two airports.

MPE readers will be interested in this article for two reasons:

1. the Winnport development here in Winnipeg.
2. a Provincial Association speaking out on an issue replete with political overtones.

Last October, Mr. Murray Brown, of Winnport Logistics Ltd., addressed a Professional Development breakfast-meeting on Winnport and its hopes to turn Winnipeg into a major distribution centre based on our airport. To someone whose out-of-city travelling is confined to Manitoba's highways, the concept of Winnipeg being at the cross-roads of the flight-paths linking North America with Europe and the Orient was an exciting idea. Obviously, the welfare of the airports at Toronto and Montreal must be of interest to Winnipegers.

Aéroports de Montréal (ADM) has made the decision to move the international flights, now

using Mirabel, to Dorval since space is available. The noise, due to the additional aircraft movements at Dorval, is expected to be reduced due to the design changes being made by the aircraft industry itself. It is estimated that Dorval will not reach full capacity before 2024, by which time the number of passengers handled, annually, will have risen to 15 million from today's six million. (Readers may recall the new Hong Kong airport is expected to handle 35 million passengers when opened and 85 million passengers by 2040 – a growth-rate of about a million passengers per year. An aircraft will land or take off from Hong Kong every 20 seconds).

Last June, M. Bernard Lamarre, ing., held a press conference at which he announced that the Order was in full support of ADM's intention to develop Dorval and to turn Mirabel into a regional airport. This stand, on the part of the Order, raised certain hackles. M. Lamarre justified the Order's intrusion into the problem with "We have carried out an independent study of all aspects of the issue and have consulted experts. Personally, I am happy that the Order has decided to take a position. It is probable that, had the Order faced up to the issue at the time the decision to build Mirabel was taken, we wouldn't be faced with having to make today's decision." □

What Happened to Manitoba Hydro's Transmission Lines on September 5, 1996?

By: G. Penner, P.Eng. & D. Spangelo, P.Eng.

The towers that were damaged in the September 5, 1996 storm were all guyed suspension structures. Each tower supports one shield-wire at its peak and two DC poles, consisting of two bundled sub-conductors each, at about 40 metres above ground. The span between towers is approximately 450 m. The towers are constructed of latticed angles and consist of one peak, two cross-arms, two guy torque-arms, and a single shaft which tapers to a point at its base. The tower baseplate rests on a convex plate and is attached to its foundation by a pin connection. The guys are attached to torque arms that extend from the face of the tower to control twist in the event of unbalanced conductor loading. Guyed towers are considerably more flexible than self-supporting towers and can therefore resist higher unbalanced conductor loads and cascading failures.

The original design loading criteria for these towers are typical of present transmission-tower design industry standards. These criteria are based on a variety of combinations of wind- and ice-loading conditions on the conductors and tower members, as listed below:

Static Loading Conditions for Typical Transmission Towers are as follows:

- Heavy Ice: 25mm (1") of radial ice + no wind
- Wind and Ice: 12.7mm (1/2") of radial ice + 385 Pa (8 psf) of wind
- High Wind: 718Pa (15 psf) of wind + no ice
- Broken and/or unbalanced above-noted conductor loads

The majority of the design loads on the towers are typically due to the conductor loading. All conditions consider static loads only. Dynamic analysis of conductor loads is primarily at the research stage and practical design criteria have not yet been developed. Manitoba Hydro, like many other utilities, is currently funding research in this field.

Failure of Bipole I and II

The highest intensity of the storm appeared to damage a very narrow strip approximately 1-2 km wide. In this strip of destruction, woodpole electrode lines on each side of the DC line were snapped 2-3 m above ground line, highway signs were broken, large round straw bales were rolled hundreds of metres, some farm buildings suffered damage, crops were flattened, and trees were broken. At the Dorsey Converter station a few kilometres south of the affected area, the winds were unofficially recorded at 125 km/h, but there was no damage to any structures, nor to the DC lines. The exact wind velocity or sequence of events at the storm centre cannot be accurately deter-

mined. However, Environment Canada's analysis of damage and meteorological radar indicates winds could have reached 180 km/h or higher.

A survey of each failed and damaged tower was conducted to record its "as failed" orientation and observe its mode of failure. As can be seen in the photos, the towers were severely damaged – some beyond recognition. Evidence indicates that a major amount of damage was caused by severe loading induced onto the towers by the conductors.

Many consistent modes of failure were observed, as noted below:

- All towers fell to the east, due to the severe winds from the west.
- The spacing of the two Bipole lines was sufficient so that a tower failure on one line did not damage the adjacent line.
- All tower shaft ends rotated off their supports with minimal damage to the shaft foundations. All foundations were reused.
- No guywires or anchor rods were broken. However, most of the windward anchor rods were bent when the towers fell. The guywires and hardware were replaced. However, the

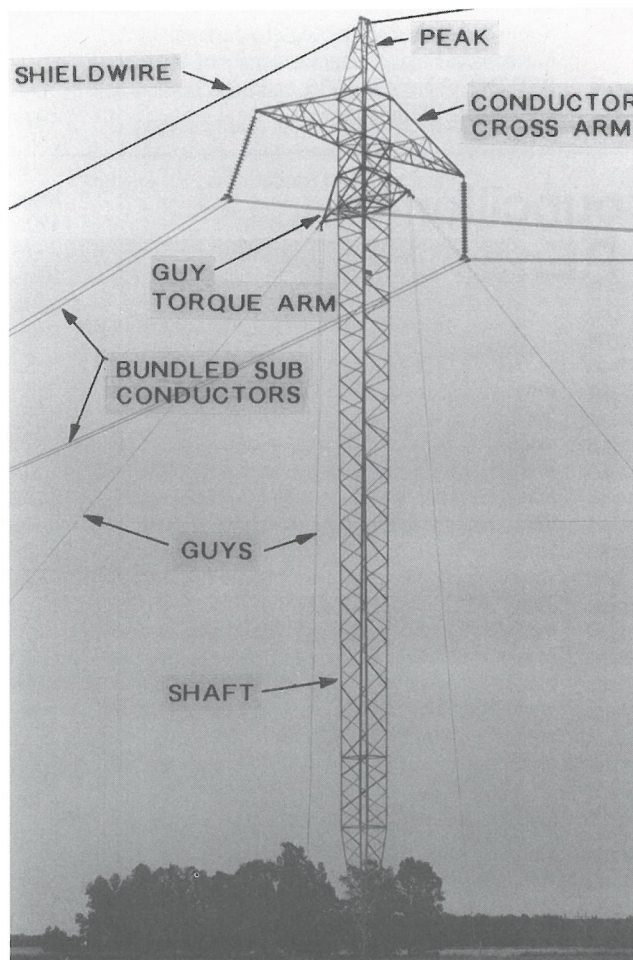
bent guy anchor rods were able to be straightened, tested, and reused.

- Most guy torque-arms and cross-arms were possibly damaged prior to the towers falling. The damaged, but still-standing towers at the southern extent of the failed group of towers show evidence of this mode of failure.
- At most tower locations, the westerly conductor ended up draped over fallen tower shafts. The conductors at these locations were damaged by being whipped by winds against the sharp edges of the steel angles of the tower faces. This conductor of each Bipole line, at one location each, was completely severed by this action. This likely caused additional unbalanced conductor loads and further damage to the towers as they lay on the ground.

In addition to the consistencies noted above, a number of unique modes of failure were also observed:

- Some of the towers buckled at mid-height due to axial compression. Others rotated off their bases with minimal damage to their shafts. These had severely damaged or broken guy torque-arms which allowed the towers to fall over before axial forces buckled their shafts.
- The bottom tapered portions of two tower shafts were severely axially crushed. It appears that these towers were lifted off their support pins and, while still vertical, were driven into the ground before they fell to the ground laterally. This possible uplifting wind force supports the occurrence of a severe wind phenomenon called rotor or outflow micro bursts, as reported possible by Environment Canada.
- Severe conductor loads tore the top portion off some towers and displaced (blew) them approximately 10-12 metres beyond the top of the tower shafts. The shafts themselves were held in place by the still-attached guys.

It may not be possible to confirm which part of each tower failed first. However, more than one mode of failure was involved, since they did not fail consistently. The most important aspect of this event is how well the tower design resisted cascading failure. Only the towers directly in the path of the severe winds were affected. Towers outside this affected area resisted high fringe-area winds in addition to unbalanced conductor loading, caused by failed towers and broken conductors, and minimized major damage. Similar events, outside of Manitoba, have brought down considerably more self-supporting (conventional-type) towers due to cascading effects. □



President Symonds Addresses the University of Manitoba Society of Automotive Engineers

By: B.A. Dobran, P.Eng., and R.J. Ferguson

On November 13, 1996, the University of Manitoba Society of Automotive Engineers (UMSAE), in conjunction with the Manitoba SAE professional chapter, held its annual Wine and Cheese. In attendance were invited professors, UMSAE students, supporters of UMSAE and the SAE professional members. The featured speaker of the evening was Mal Symonds, P.Eng., a longtime friend and supporter of UMSAE, who is Director of Aircraft Engineering at Bristol Aerospace and the current President of APEM. The topic of his address concerned the challenges involved in the retro-fit of the F-5 fighter aircraft. His multi-media presentation lasted about 45 minutes, followed by a question period. Next, Paul Harrison and Ryan Ferguson discussed the design objectives and progress of this year's competition vehicles.

UMSAE, a non-profit student organization, is dedicated to producing winning vehicles for inter-university competition. It helps students to develop skills in professionalism, teamwork, innovation, project management and effective communication. Over the years, UMSAE has had a long and successful history in student vehicle design projects. This year, UMSAE has divided its efforts along two fronts: the Aero Design Competition and the Formula SAE race car.

The objective of the Aero Design competition is to design and build a scale aeroplane capable of

lifting the highest payload. UMSAE plans to send two 'planes to the June, 1997, competition in Seattle, Washington. One of the 'planes will be constructed of composites, thanks to the generosity of Boeing Canada located in Winnipeg. The focus of the Formula SAE competition, to be held in May, 1997, in Pontiac, Michigan, is to design, construct and test a formula-style race car. The UMSAE formula car will be light-weight, single-seat, and open-wheeled. The car will be powered by a modified Honda Hurricane CBR 600cc motorcycle engine with a fully independent, wish-bone suspension. Also, courtesy of Boeing, the car will have a composite body and wing.

Students are currently designing and building the vehicles that are to appear in competition in the next few months. They are in need of more funds in order to take these vehicles from the drawing board to the competition. Donations of materials, equipment and/or money would be greatly appreciated. Without the support of industry and the professionals, these vehicles will not make it to competition. If you have any questions concerning the UMSAE design vehicles and/or would like to contribute to the projects, contact the UMSAE Chair, Ryan Ferguson, at UMSAE, Room 356 Engineering Bldg., Department of Mechanical Engineering, University of Manitoba R3T 2N2, phone 474-8736, or email: umferg26@CC.umanitoba.ca □

A Professional Development Activity for All

By: J. Lucas, P.Eng.

For those of you who couldn't make it to the APEM Annual General Meeting, you missed out on a very successful failure: Mandatory Reporting of Professional Development.

There was complete agreement that this is the right thing at the right time...but just not here and now. In the words of our Prime Minister, "everyone wants to get to Heaven, but no one wants to die."

But life goes on, and paradigms shift. Change is coming, folks, but you are not alone! As an introductory Professional Development experience, the following head-bender is offered for your amusement – oops, I mean development.

- | | |
|-----------------------------------|---------------------|
| 1. Let | $x=1$ |
| 2. Then obviously | $x=x$ |
| 3. Square both sides | $x^2=x^2$ |
| 4. Subtract x^2 from both sides | $x^2-x^2=x^2-x^2$ |
| 5. Factor both sides | $x(x-x)=(x+x)(x-x)$ |
| 6. Factor out the $(x-x)$ | $x=(x+x)$ |
| 7. or | $x=2x$ |
| 8. and since $x=1$ | $1=2$ |

Keep track of your time on this one. It may count as PD on your next report! □

Meet Your New Councillor – Kelly Olischefski, P.Eng.

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

Kelly Olischefski is one of three new Councillors who were elected in October, 1996 to serve a two-year term.



New Councillor, Kelly Olischefski

Kelly graduated from the University of Manitoba in 1988 with a B.Sc. in Mechanical Engineering and then continued on with graduate studies. While working as a junior engineer with Wardrop Engineering, Kelly received a Master of Science in Engineering in 1991. Continuing in the consulting field, Kelly was employed with Roberts, Sloane & Associates until 1993 when she became a project engineer with Phillips & Temro Industries, Ltd. At Phillips & Temro, Kelly oversees the research, design, and development of new-circulation engine pre-heaters and battery blankets, both of which are used to aid cold-weather starting of engines. Not many would argue that Winnipeg is THE place for those products!

Kelly has been very active with professional activities since the beginning of her career. She has been a member of APEM since 1993 and, as well, has served on the following committees: Women in Engineering Advisory Committee, 1993-present (Chair, 1995-1996); Awards Committee, 1994-1995; Capitalizing on Today's Chal-

lenges Conference Organizing Committee, 1993-1995. Kelly is also a member of the Society of Automotive Engineers (SAE) for which she has been a Governing Board member since 1994, and is editor of the SAE newsletter. Since all this didn't seem to keep her busy enough, Kelly has also been involved with the Innovators in the Schools program and has spoken to various women's groups on Women in Science and Engineering on several occasions.

One of the objectives Kelly hopes to accomplish while on Council is to provide a perspective from private industry. Other important issues for Kelly include support of minority groups and CCPE's effort to streamline the provincial associations. Kelly is also concerned about the participation of engineers in government decision-and policy-making, particularly when issues affecting APEM are being addressed.

Kelly's husband, Derrin (also a mechanical engineer), is the Applications Engineering Manager at New Flyer Industries. They enjoy skiing, camping, and especially golf. Kelly and Derrin have two lovely (but not so friendly) cats and recently took on a new challenge, parenthood, with the arrival of their first child, a boy, in December. They should be realizing the real meaning of "working overtime" very soon! Good luck, Kelly. □

Dr. Sami Rizkalla, P.Eng. – CCPE Meritorious Service Award

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

In November, 1996, Dr. Sami Rizkalla, P.Eng., was awarded the Canadian Council of Professional Engineers (CCPE) Meritorious Service Award for Professional Service.

Dr. Rizkalla is a Professor of Civil Engineering at the University of Manitoba and President of the Canadian Network Centres of Excellence on Intelligent Sensing for Innovative Structures (ISIS Canada), which was established by the Federal Government in 1995. Through ISIS, "smart" structures are being developed with the use of integrated fibre-optic structural-sensing systems. The data collected is processed and transmitted by telephone or satellite link to a central monitoring location where it can be further reviewed.

Dr. Rizkalla's current research is in the field of advanced composite materials and civil engineering applications. He is the Vice-President of the Board of the Advanced Composites in Bridges and Structures Network of Canada, the Chief Editor of Fibre-Reinforced Plastic (FRP) International, and an Associate Editor of both the *Canadian Journal of Civil Engineering* and the *Composites for Construction Journal*.

Dr. Rizkalla is the immediate past chair of the Structural Engineering Division of the Canadian Society for Civil Engineering. In 1988, he was elected *Fellow of the American Society for Civil Engineers*; in 1992, *Fellow of the Canadian Society for Civil Engineering*, and *Fellow of the American Concrete Institute*; and in 1995, *Fellow of the Engineering Institute of Canada*. He is a member of three technical committees of the American Concrete Institute: FRP Reinforcement, Precast

Concrete, and Computer Applications.

Dr. Rizkalla has published and presented over 150 technical papers in journals and conferences in the field of reinforced and prestressed concrete, as well as co-authored four technical books in the fields of structural engineering and advanced composite materials.

Dr. Rizkalla has been active in the Association of Professional Engineers of Manitoba (APEM) and served on several committees. In 1994, he was awarded the *APEM Award of Merit* for his contributions and activities in engineering education and advancement of technology. In 1995, Dr. Rizkalla was presented with an award for superior academic performance by the University of Manitoba.

APEM members, especially structural and civil types, are also familiar with Dr. Rizkalla's recent efforts in establishing and updating the Structures Laboratory facility at the University of Manitoba. There, work and testing is currently underway for projects related to the use of advanced composite materials (in conjunction with Winnipeg consulting engineering firms), for use by both the Province of Manitoba's Bridges and Structures Department, and The City of Winnipeg's Streets and Transportation Department.

Dr. Rizkalla has provided leadership in provincial, national and international bodies as well as local community organizations.

Congratulations are to be extended to Dr. Rizkalla for this well-deserved award, which recognizes his contributions to engineering. □

Pay Your Dues!

Dues invoices have been mailed to all members and EITs. Members are again reminded that receipt of dues in the Association office after February 28, 1997 will incur a late payment administration fee of \$54.00. If fees are mailed prior to February 28th and received after February 28th, the late payment fee will apply.

Members

Members are reminded that if all fees owing are not received in the Association office before July 1st, 1997, your name will be removed from the register and you will then be prohibited, by law, from practising engineering in Manitoba.

EITs

EITs are reminded that if all dues and fees are not received in the Association office before July 1, 1997, your name will be removed from the roll of Engineers-in-Training. Should that occur, it will be necessary for you to reinstate as an Engineer-in-Training. You will also be required to fulfill the 1997 requirements before becoming eligible for registration as a professional engineer.

President's Message

(Cont'd from page 3)

Earlier, I used the phrase "engineer/technologist work continuum". I believe that "engineering" is a branch of applied science that has a range that extends across many disciplines and educational levels. The work that technologists do can certainly be defined as engineering at a level that is commensurate with their formal education and experience. Could anyone rationally say that, when engineers perform the same tasks as technologists at the more basic end of their taskings, that they are not practising engineering? As a result, we must recognize that technologists do practise engineering up to, but not including, tasks defined as "professional engineering" or those tasks covered under demand-side legislation. While this is a vague and inconclusive separation of tasks and responsibilities, it is, and will be, the focus for continued research and debate in order to find an equitable order within the engineering work continuum. Perhaps when we solve this problem, the solution can be used as a model to deal with our relationships with other applied scientists such as architects, land surveyors, physicists, chemists, etc.

Finally, with the world becoming more and more competitive, we in Canada cannot afford these "internal" battles. We need to define our own technical relationships, agree to them, and then go forth as a united engineering team to take on the international challenges that face us. □



CCPE Board Chair John Bate (l) presents Sami Rizkalla with CCPE Award.

Council Reports

Tuesday, November 19, 1996

By: B.A. Dobran, P.Eng.

AT WHICH COUNCIL DECIDES THAT THE TITLES "ENGINEER" AND "GEOLOGIST" SHOULD BE PROTECTED

APEM's new President, Mal Symonds, P.Eng. called the meeting to order promptly at 12:30 p.m. He opened by welcoming the new councillors, Doug Kramble, Kelly Olischefski and Kathy Pratt to Council. All of the councillors then gave a brief introduction of themselves. Council then set about addressing the 21-point agenda.

First, President Symonds encouraged all councillors to review the "Issues and Activities Status Report" provided to councillors with the agenda information prior to each Council meeting. This way, all councillors can be aware of the issues and actions that the Association is currently dealing with, and can suggest matters of concern for the agenda. The agenda was then approved, with the addition of Item No. 22, "National Engineering Week".

Next, the minutes of the October 8, 1996, Council meeting were adopted as circulated. It was agreed that the minutes of October 21, 1996, would be considered under Item No. 15, Status Report on The Engineering and Geoscientific Professions Act. Council considered the minutes of the meeting of

the Executive Committee dated November 5, 1996. Council then received the minutes and ratified the actions contained therein.

Next, Council considered the financial statements for August and September, as presented by Dave Ennis. For the information of the new councillors, Mr. Ennis gave a brief overview of the basis of the system used by APEM in preparing the monthly financial statements. The financial statements, dated August 31 and September 30, 1996, were then approved.

In further Council Business, Council considered a memo from President Symonds, dated November 13, 1996, regarding the election of the President-Elect and the Executive Member of Council. Mr. Symonds noted that Mr. Washchyshyn and Dr. Britton had agreed to serve on the Executive Committee until such time as the President-Elect and the Executive Member are elected. Council then decided that the election of the President-Elect and the Executive Member be deferred until the next meeting of the Council.

Dr. Brisbin joined the Council meeting to advise of the concerns of some of the geoscientists regarding the Engineering and Geoscientific Professions Act. After Dr. Brisbin's talk, Shirley Matile, APEM's Director of Admissions, stated that we must continue to protect the title "engineer", as well as the title "professional engineer", for the protection of the public, as well as for national consistency. Council eventually agreed that the geoscientists should be subject to the same requirements as the engineers in this regard, since they are seeking inclusion in the Engineer's Act. □

Tuesday, December 10, 1996

By: C.P. Gray, P.Eng.

AT WHICH COUNCIL SUPPORTS IRON RING STAMP INITIATIVE

APEM President, Mal Symonds, called the Council meeting to order at 12:30 p.m. December 10, 1996. After the usual administrative and business matters (adopting the agenda, approving previous minutes and discussing business from the previous meeting), Council got down to organizing its new structure. Peter Washchyshyn was elected President-Elect and Ron Britton was elected to the Executive Committee. Councillors volunteered for liaison roles to the various boards, committees, task groups and chapters (in total there are 21 boards, committees, and task groups, and two chapters). In addition to their duties on Council, most Councillors are active members of one or two boards, committees, task groups, or chapters.

Executive Director, Dave Ennis, advised Council that there would be no employee salary survey for 1997 and Council might consider an employer's survey for the purpose of providing an update to the Consulting Engineering Fee Guide.

On the recommendation from the Registration Board, Council approved a change to the Admissions Manual to close a potential loophole requiring APEM to admit non-practising members from other associations under the Interim Inter-Association Mobility Agreement. Now, all applicants under the Agreement must be registered as practising members of other Associations. As well, Council approved giving the Registration Board discretion to rule on applications for transfer from persons whose memberships in other associations have expired.

On the recommendation of Mr. Wells Peever (Legal Counsel for APEM), Council approved the changes to the proposed Engineering & Geoscientific Professions Act (to be submitted to the Manitoba Legislature in 1997). The changes to the proposed Act include a provision for specifying a compulsory continuing-development program and empowering Council to deal with members who are in non-compliance with a continuing-development program.

Mal Symonds advised Council that the Task Group negotiating with CCTAM (formerly MANSCETT) is meeting CCTAM on December 10, 1996, to discuss the Terms of Reference for the Joint Board with APEM & CCTAM. The Task Group will provide a report to Council at the next meeting.

Council approved an editorial policy developed by the Publication Committee. The editorial policy applies to all information distributed with the APEM mailing (including the MPE).

Council voted to support an initiative by the Corporation of the Seven Wardens (the organization responsible for the iron ring and iron ring ceremony) to commemorate the "75th Anniversary of the Iron Ring" with a postage stamp. Council agreed to send a letter to The Honourable Andre Ouellet (Chairman of the Board, Canada Post Corporation) and to include an article and a form-letter in the MPE to encourage members to support this initiative.

Council received, from the Texas State Board of Registration for Professional Engineers, a "letter of intent to implement the document of mutual recognition of registered/licensed engineers to facilitate mobility in accordance with NAFTA". Texas is the first U.S. State to have signed a letter of intent. □

Industrial Engineering Co-op Education Program

By: B.A. Dobran, P.Eng.

May, 1996, marked the graduation of the first class of Industrial Engineering (I.E.) Co-op students from the University of Manitoba. This co-op program was started in September, 1993, as a direct result of a generous grant from the Government of Canada, Department of Employment and Immigration.

Each of the co-op students completed four four-month work terms and the majority of large and mid-sized companies that hired the students were located in Manitoba. Most of the students completed two eight-month work terms with two different companies, rather than four work terms with four companies. The general response from

the companies' managers was that the job attitudes of the co-op students were excellent, that the students gained valuable industrial experience, and that the companies benefited from the employment of these undergraduate students.

The Faculty of Engineering is also a beneficiary of the co-op program, because some of the suggestions submitted by the students' supervisors are useful in determining changes that may be made in certain undergraduate courses.

It is noteworthy that about 80% of the I.E. co-op students had secured permanent employment before they graduated. □

An Overseas Work Experience

By: T.G. Sims, EIT

Maybe you have contemplated working in a developing country, or are finding that your job is getting a bit mundane and it is time for a change. You might have heard of someone who went overseas and worked, or done so yourself. At the time when I was contemplating working overseas, I was also very interested in Appropriate Technology (technology which is appropriate to the needs and skills of the people whom it is serving), and wanted to apply this in my working life.

My posting was with a Canadian non-governmental organization (NGO), Plenty Canada, and its African counterpart, Plenty Lesotho, in the tiny African country of Lesotho. In case you are wondering where that is, check your atlas. You will notice that it is a country landlocked completely by the Republic of South Africa. Lesotho is a mountainous country with less than 9% arable land. About 80% of Lesotho's 2 million (1991) population is rurally based. Funding for my travel, expenses, and living allowance was provided by World University Services of Canada (WUSC). In January, 1996, WUSC closed its field office in Lesotho.

I was recruited as the Water Engineer for a rural development project which is implementing a water supply and sanitation program. This highly varied position entailed everything from funding proposal-writing, detailed designing of water systems, dealing with materials suppliers, and final-report writing.

The project addresses the need for potable water for the area's rural population – an area of two river valleys and approximately 500 villages, many of which are without clean or available drinking water or proper sanitation facilities. The focus of the water project is to have a reliable source of clean drinking water brought to within 150 metres of every household in a village. According to the World Health Organization, a minimum of 30 litres per consumer per day should be supplied. Remember that when you are flushing the toilet! All of the supply schemes are in fairly small villages, with populations of between 50 and 800 people. To ensure reliability and simplicity, gravity feed design is used almost exclusively, with the exception of one hydraulic-ram pump installation. The mountainous terrain is well-suited for this type of design.

As women are the traditional bearers of water, they may be carrying buckets of water on their heads from the nearest spring or stream source anywhere from 100 metres to a kilometre away. During the dry season (April until October) these springs may dry out, in which case the villages will then have to rely on sources even further away. The water is not necessarily clean, and could be contaminated by a variety of sources. In fact, there were reported cases of typhoid in project-area villages without water-supply schemes.

The springs are usually unprotected from grazing animals and may easily become polluted.

During the construction of the project, the village is required to contribute their labour on a voluntary basis. As women are the bearers of water, it is considered their job to participate in the water scheme. One will see the women swinging picks for digging trenches or hauling materials, often while carrying babies on their backs! That is not to say that the men do not participate, but roughly 75% of the labour is from female hands.

The design of the water system will include the safe catchment and protection of the spring, some kind of storage, and a distribution system. It is interesting to note that there are no private tap connections allowed in these systems. This is to



prevent conflicts in the village and to ensure that there will be adequate water for everyone. As a result, from 40 to 120 people may be served from a single tap-stand. It is therefore important to carefully select the location of a tap in order to ensure maximum consumer satisfaction. Design criteria state that villagers should not have to walk more than 150 metres to draw water; only in exceptional cases is 300 metres considered acceptable. The selection process is often done with input from some village members to be sure that the village agrees with the location.

Containment-tank structures are built of brick or shaped stone (if it is available near the construction site). If building stone is available, it will be the villagers who shape it with hammer and chisel. The construction is performed by trained brick-layers who are employed by the project. The spring catchment will require excavation until an "eye" (where the water escapes from the rock) is found. It is then ready for a concrete cap with a piped connection. The galvanized-iron pipes which are used in the systems are more

costly than high-density polyethylene (HDPE) pipe, but are found to be more reliable from a leakage point of view.

On one occasion I arrived at a village where the women had stopped working on the spring excavation because, according to the traditional beliefs, they believed a snake was living in the spring and it was dangerous to disturb it. They feared that they were getting too close to the snake's abode! This incident was remedied by the construction supervisor's taking the Abney level that I was carrying and looking through it at the spring site. He then proclaimed to the workers that he could see through the instrument that there was no snake in the spring, and they should proceed with their work. On several such occasions I have come across perplexing and even mysterious reasons for work being hindered. Fortunately, my Lesotho counterparts knew how to deal with these problems that left me completely stumped. I feel it important to respect these traditional cultural beliefs as an integral part of the working situation in my host country.

The village chief usually informs the Plenty Project if the village is in need of a water-supply scheme. This is followed with an assessment. An important indicator during the assessment is how motivated the village is to have water. This is crucial because the villagers are expected to do all of the manual work themselves! This includes trench-digging, carrying of materials, and helping the masons who come to build the structures and fit the pipes. The mason(s) are stationed in the village for the duration of the construction phase of the project. Free accommodation is donated by the village as part of the contribution to their water scheme. Typically the water source(s) will be springs fed from underground water.

Once money has been granted to install the water system through funding proposals, the detailed design can begin. One of the two college-trained technicians will go to the village, survey from the springs which are in the area, and create a design to serve the village. Instruments used for surveying are an Abney level, a measuring wheel, and a compass. Only on very flat terrain, or when greater precision is required, is an automatic level used. Pipe sizing is determined according to demand, size of the spring(s), terrain, and system layout. Hydraulic grade-lines are plotted, and checked for negative pressure. Finally, when all of this has been approved, a scaled site plan can be drawn up for use by the masons during construction and for engineering records.

As Lesotho is a mountainous country and the locations of construction remote, many of the sites are only accessible by four-wheel-drive vehicles. Often this means that the materials must be carried to construction sites by the villagers (usually women) from the roads' last access point.

There is a governmental department, the Department of Rural Water Supply (DRWS) which also provides water supply systems in Lesotho. They have fairly high standards of construction. Based on these standards, the Plenty

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Storage of Nuclear Waste

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

Allan Ball's article, "1996 International Conference on Deep Geological Disposal of Radioactive Waste", in the December issue of *The Manitoba Professional Engineer*, arrived on my desk at exactly the right time. I had seen "Nuclear Waste: the Headache" in the August issue of *Science et Vie* in which France's search for a site for deep-burial of radioactive waste is described.

France produces between 75% and 80% of its electricity in nuclear generating plants. "In a thousand, ten thousand, one-hundred thousand years, certain of the radioactive wastes created in our nuclear generating-stations will still be present." As a result, last May, ANDRA (the French national agency for the management of radioactive waste) asked the government for authority to find three underground laboratories in which to study the possibility of deep storage of very reactive long-life waste. The sites now being investigated are at Cirfontaine-en-Ornois in the north-east of France, la Chapelle-Baton south of Orleans, and Marcoule in the south-east. In 2006, one of these is to be chosen ("perhaps") for the storage of nuclear waste.

The "perhaps" is because of the opposition of CEDRA (the national organization against the burying of radioactive waste). These opponents reject the acronym "NIMBY". Their slogan is "Neither here nor anywhere else but by some other means."

The "other means" used by the French thus far (and this translator is not an expert on any of them!) are:

1. Mixing the material with glass (vitrified nuclear-waste) which must then be cooled for at least fifty years.

2. Retreatment to produce Mox (a mixture of oxides of plutonium and uranium) which is used in "a dozen reactors". However, there is radioactive waste from such plants, and two cycles of "retreatment" is all that is economically feasible, considering the price of uranium ore today.

The French have had a plant for looking after items that have become radioactive – wrenches, filters, gloves, parts of nuclear generators, etc. – on Cap de la Hague, west of Cherbourg and south of Southampton. These items are of weak radioactivity of short duration. It appears that they are stored above ground in some kind of bitumen in concrete cylinders although storage in a "swimming pool" is also mentioned.

The La Hague site is now filled so a new site has been opened in the valley of the Aube, which is a small river that drains into the Seine up-river from Paris.

Both the La Hague and the L'Aube sites will have to be watched for the next three hundred years in spite of the nuclear "garbage" that is stored there being of "short duration".

The article is illustrated as only S&V can do it. One of the photographs is of the Swiss subterranean laboratory. The "clip" associated with this photograph is headed, "100,000 years under the earth".

Then I recalled what Louise B. Young had said in her remarkable book, *The Unfinished Universe* (p.201) "...and Homo sapiens has been in existence for no more than a hundred thousand years."

Do aging P.Eng.'s worry too much? □

Roster Changes

Please Make the Following Changes to Your 1996 Roster

T.G. Beuthe, P.Eng. – B.Eng., McMaster University, Engineering Physics, 1985; M.Eng., McMaster University, Engineering Physics, 1988; Ph.D., McMaster University, Engineering Physics, 1992

M.K. Coyne, P.Eng. – Diploma Structural Engineering, Brixton University, London, England, 1967; Jenisys Engineered Products

B.R. Kidd, P.Eng. – B.Sc., Ag. Engineering

G.A. LeMoal, P.Eng. – B. Eng. Civil Engineering, Royal Military College, 1965, M.Sc., Civil Engineering, University of Calgary, 1971

B.U. Lutter, P.Eng. – Dipl. Eng. for M.E., Technical University of Graz.

B.D. MacBride, P.Eng. – M.Sc. Environmental Engineering, University of Manitoba, 1980; M.B.A., University of Manitoba, 1985

C.H. Moche, P.Eng. – Manitoba Environment

W.H. Powell, P.Eng. – B.Sc., Mechanical Engineering, University of Manitoba, 1970

R.S. Read, P.Eng. – Ph.D., Civil & Geological Engineering, U of Manitoba, 1994

S.S. Rihal, P.Eng. – M.Sc. C.E., University of Manitoba, 1986

E.M. Scott, P.Eng. – M.B.A., University of Washington, 1969; Ph.D., University of British Columbia, 1977

J. Shewchuk, P.Eng. – Ph.D., Engineering Mechanics, Penn State, 1966

J.P. Shewchuk, P.Eng. – M.Sc.I.E., Purdue, 1991, Ph.D. I.E., Purdue, 1995

R.S. Tebinka, P.Eng. – B.Eng., Civil Engineering, Lakehead University, 1977; M.A.Sc. Civil Engineering, University of Waterloo, 1980

W.W. Tennesey, P.Eng. – Ph.D., Mechanical Engineering, University of Manitoba, 1982

S.D. Topping, P.Eng. – B.Sc., Water Resources Engineering, University of Guelph

E.F. Vickers, P.Eng. – B. Eng., C.E., M. Eng. C.E., employed with Robertson Building Systems □

APEM Council Seeks Member Assistance in Lobbying for a Postage Stamp to Commemorate 75th Anniversary of the Iron Ring

APEM'S Council, at its December 10, 1996, meeting, voted unanimously to ask the members of APEM to assist The Corporation of the Seven Wardens and the Canadian Council of Professional Engineers (CCPE) in their quest to have Canada Post develop a postage stamp for the year 2000 to commemorate the 75th anniversary of the Ritual of the Calling of an Engineer.

The Corporation of the Seven Wardens (the organization responsible for the "Iron Ring Ceremony") has formed a committee to prepare a commemorative postage stamp, and Camp No.1 is providing funding for the project. Unfortunately,

the Corporation has been advised that 75th anniversaries are not recognized by Canada Post.

At its meeting, Council considered a letter from CCPE President John Bate, urging all Associations to lobby their parliamentarians as well as Andre Ouellet, Chairman of the Board, Canada Post Corporation, 1250-2701 Riverside Drive, Ottawa, Ontario K1A 0B1, to promote the development of an "iron ring" commemorative stamp. Council is asking all members of APEM to lobby their Members of Parliament and/or Mr. Ouellet for the stamp, which, as Mr. Bate says, "would go a long way to raising the profile of our profession in this country and abroad". □

Attention, EITs!

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

Late last year, you received your invoices for your 1997 EIT dues. These dues were payable by January 1, 1997, although there is no penalty for late payment until after February 28, 1997.

Even if you expect to be registered as a professional engineer early in 1997, your EIT dues must be paid in full, prior to registration.

Upon registration, you will be invoiced for the 1997 annual dues for practising members; and if you are registered before June 30, 1997, you will be refunded one-half of your EIT dues (all annual dues are pro-rated on a semi-annual basis). □

NAFTA Update

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

Almost daily, I receive inquiries regarding the NAFTA, and how it will affect Manitoba engineers wishing to practise engineering in the U.S.

First of all, you should understand that the NAFTA is a trade agreement, negotiated among three federal governments. It is the first agreement ever to include services as well as goods. The parties which negotiated the agreement, however, do not have jurisdiction over the provision of services, and cannot, therefore, be the bodies which will implement the agreement.

Under the NAFTA, the engineering professions in each of the three countries were required to meet, and to develop a mutual recognition agreement (MRA), outlining the requirements for an engineer in one country to practise in another.

The CCPE set up a team of six engineers to represent the engineering profession in Canada. The U.S. was represented by a consortium of three national engineering organizations. Mexico was able to develop a team with representatives of the jurisdictional bodies.

The three teams negotiated a mutual recognition agreement (MRA) which was signed in June, 1995. Under this agreement, if you:

1. Hold an accredited Degree;
2. Have at least 12 years' Experience (8 after registration);
3. Can demonstrate knowledge of Local Codes and Practices;
4. Have effective language skills;
5. Agree to comply with local law;
6. Are willing to accept cross-border discipline; and
7. Comply with local continuing competency requirements;

or

1. Hold an unaccredited degree;
2. Have at least 16 years' experience (12 after registration);
3. Can demonstrate knowledge of local codes and practices;
4. Have effective language skills;
5. Agree to comply with local law;
6. Are willing to accept cross-border discipline; and
7. Comply with local continuing competency requirements;

you will qualify for a one-year renewable temporary licence to practise in any of the other jurisdictions that are signatories to the MRA.

The jurisdiction for the implementation of the MRA rests with the provincial and territorial engineering Associations in Canada, and with the State Licensing Boards in the U.S. – not with the bodies which negotiated and signed the MRA. It is up to each individual provincial association or state board, therefore, to implement the MRA.

Where is APEM?

We have submitted a letter of intent to sign the MRA, but the details of implementation have not yet been worked out. We have identified areas in which our legislation and policies are inconsistent with the MRA, and are working on the necessary revisions (for example, we just changed our By-laws to enable the temporary licensure of Mexican engineers – although we have yet to develop the necessary policies and procedures.) Most importantly, however, whatever we do in terms of implementation **must** be consistent with the processes adopted by the other Canadian associations – which means that the implementation process may take a while!

Where is Canada?

By October, 1996, most of the Canadian engineering Associations had submitted to CCPE Letters of Intent to "sign on" to the NAFTA MRA.

In November, 1996, the Admissions Officials from the Associations across Canada met in a first attempt to develop an implementation procedure that can be uniformly implemented across Canada. The results of that meeting, at which some consensus was reached, will be (and likely have been, by the time you read this!) forwarded to CCPE for approval. Once approved, a national guideline will be issued, and this Association will commence with the adoption of policies and pro-

cedures for offering temporary licences to U.S. and Mexican engineers.

What is Happening in the U.S.?

Anyone who has attempted registration in the U.S. will be aware that, to become registered there, you currently have to complete two eight-hour examinations. (U.S. graduates have to write these examinations prior to registration, and so, therefore, do Canadians. Some state boards will waive the first examination – an examination in engineering fundamentals – if you have a significant amount of engineering experience; however, it is very rare that a Canadian engineer becomes registered as a P.E. in the U.S. without writing at least eight hours' worth of exams!) The NAFTA MRA represents the first window of opportunity for Canadians to practise in the U.S. without examination.

By all accounts, the U.S. appeared initially to be "foot-dragging", because the organization responsible for the examinations would have a great deal to lose by registering Canadian and Mexican engineers without further examination when they don't even register U.S. engineers without examination. Now, however, they appear to be developing implementation procedures, and one State Board – Texas – has committed to "sign on" to the MRA and to commence with the development of the required procedures for implementing it.

And Where is Mexico?

In terms of the Mutual Recognition Agreement, Mexico is committed. Not having had a system of registration or of accreditation in place before the

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Marathon Update

By: M.D. Vanderpont, P.Eng.

Who would have believed it? Professional Engineering Team No. 1 consisting of Dave Whitmore, Jim Terris, Jim Bailie, Roger Boychuk, and Alan Aftanas has been awarded the silver medal for its second-place

overall performance in the "Corporate Male" category of the 1996 Manitoba Marathon Relay!

Somehow these guys turned in a second-place finish in spite of the fact that Roger and Jim Bailie spent over five minutes looking for each other at the third exchange point. FIVE MINUTES!

Congratulations, guys, on an excellent run! A little work on those exchanges, and who knows what could happen? □



Corporate Male Silver Medal Winners (l to r) Dave Whitmore, Jim Terris, Jim Bailie, Roger Boychuk and Alan Aftanas.

NAFTA Update

(Cont'd from page 11)

NAFTA, Mexico has a great deal of "catch-up" to do. But Mexico is proceeding rapidly in the development of the necessary infrastructure, and will soon, we believe, be offering temporary licenses to Canadian engineers.

Why did we Agree to Sign the NAFTA MRA?

APEM was created by an act of the provincial legislature to regulate the practice of engineering for the protection of the people of Manitoba. Now the Federal Government is asking us to use APEM as a trade vehicle. There is an unquestionable dichotomy, here. Can it work? Your Council feels that it can. Trade in engineering services is becoming increasingly important to Canada, and Council believes that the profession has a responsibility to develop engineering exports to create jobs and wealth in Canada.

On a truly self-interest level, it is illegal to practise engineering in Mexico unless you belong to an association which is party to the NAFTA MRA. Signing the MRA will allow our members the opportunity to practise engineering in Mexico. Signing the MRA will also allow our members with 12 or 16 years' experience wishing to practise in signatory U.S. states to do so without examination. The NAFTA MRA should be viewed as a small step toward international agreements recognizing full professional qualifications, which will enhance the international mobility of Manitoba engineers.

There is much work to be done in the area of admissions policies, etc. before we will be able to actually implement the terms of the NAFTA. And this is doubtless true of all of the other Canadian and American jurisdictions. It is not necessarily true of Mexico, however; and you are encouraged to make application to practise engineering in Mexico under the NAFTA MRA as soon as you learn to speak Spanish! □

Coming Events

WESCANEX '97 -

Western Canada Conference and Exhibition on Communications, Power and Computing

May 22-23, 1997
Delta Winnipeg Hotel

For details, see the Wescanex Web Site at
<<http://www.ee.umanitoba.ca/~wescanex/wes97.html>>

or call or fax Witold Kinsner, P. Eng.: ph.(204) 474-6490; fax (204) 275-0261

An Overseas Work Experience

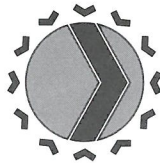
(Cont'd from page 9)

Project builds and facilitates funding of their project. The territory for water-supply coverage has been divided upon mutual agreement between DRWS & Plenty Projects as neither has the capacity to cover all areas.

At the completion of my two-year contract with Plenty Lesotho, I moved across the Orange River (which, incidentally, is being dammed by one of the largest infrastructure-improvement projects in the world!) to manage the construction of a rural road. The road was being built by about 100 people from an adjacent village using hand tools (E.F. Schumacher, author of *Small is Beautiful* would love it!) and working five hours per day. Food rations were being provided by the World Food Programme in lieu of monetary payment. This food aid is an emergency-relief measure taken as a result of the severe drought which has been affecting the whole of Southern Africa. Last year's crop was almost a complete failure due to the drought.

I am currently on a one-year contract with DRWS, as the Drought Engineer. Special funds have been made available during the drought to supply water to villages which are in critical need of this most precious resource. Technically, the work involves a wider spectrum of technology, including diesel, solar and electrical pumping systems from high-yield boreholes. Some of the villages are much larger, with populations of up to 4000 people. In one case, in the village of Tsikoane, there are only six operating borehole hand pumps serving a population of 1500. As a result, villagers are forced to seek water in neighbouring villages, draw it from the contaminated Caledon River, or drive several kilometres to a town for their water needs. The only solution in this case is a high-capacity borehole system.

I must say that I have had a very positive experience overseas. Not only has it been rewarding in terms of work experience, but, more importantly, it has been enriching at a personal level. It has exposed me to the difficult realities that much of the world's population struggle with daily. It has also provided me with the opportunity to practise my engineering discipline in a beneficial way. I encourage anyone who has an interest in overseas development work to seriously consider making it a reality for themselves. Good luck! □



CCPE NATIONAL SCHOLARSHIPS 1997 COMPETITION OFFICIALLY OPENS

The Canadian Council of Professional Engineers is pleased to announce the opening of the 1997 National Scholarship Program competition. Six cash prizes totalling \$50,000 will be awarded to promote excellence in the Canadian engineering profession through advanced studies and research programs.

To be eligible, candidates must be registered as full members with one of the provincial/territorial professional engineering associations/ordre.

The following scholarships are available:

The **MANULIFE FINANCIAL** scholarship Program offers three scholarships of \$10,000 each to provide financial assistance to engineers returning to university for further study or research **in an engineering field**. **Candidates must be accepted or registered in a Faculty of Engineering.**

The **MELOCHE MONNEX** Scholarship Program offers two scholarships of \$7,500 each to provide financial assistance to engineers returning to university for further study or research **in a field other than engineering**. **Candidates must be accepted or registered in a Faculty other than Engineering.** The field of study chosen should favour the acquisition of knowledge pertinent to enhancing the performance of the candidate in the engineering profession.

The **ENCON Endowment** of \$5,000 will be awarded to an individual wishing to pursue studies in the area of engineering failure investigation, risk management, and/or materials testing. This area of engineering is concerned with the analysis of the various causes of materials failure, and the prevention of accidents, which may result from them, either in the industrial, manufacturing, or construction sector.

Deadline for all applications is May 1st, 1997.

Contact your provincial/territorial professional engineering association/ordre, or the National Scholarship Program, Canadian Council of Professional Engineers, 406-116 Albert Street, Ottawa, Ontario, K1P 5G3. Tel - (613) 232-2474, Ext. 227; Fax - (613) 230-5759; or E-mail - chantal.lalonde@ccpe.ca

CCPE wishes to thank ENCON Insurance Managers Inc., MANULIFE FINANCIAL and MELOCHE MONNEX INC. and its subsidiaries, Monnex Insurance Brokers Limited and J. Meloche Inc., for their continued sponsorship of this program.