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THE KEYSTONE PROFESSIONAL

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

APRIL 2002
www.apegm.mb.ca

National Engineering Week 2002

An Evening of Recognition

By: D.H. Inglis, EIT

A reception was held on Tuesday, March 5, 2002 at the Niakwa Country Club to welcome new members of the Association and to honour the recipients of the 2002 Awards of Merit, Leadership and Early Achievement, as well as the Certificate of Engineering Acheivement.

Mal Symonds, P.Eng., Chair of the Awards Committee, emceed the evening while Past-President Alan Pollard, P.Eng., welcomed the new members and presented the Awards of Merit, Leadership and Early Achievement, as well as the Certificate of Engineering Acheivement, to the following recipients:

Merit Award

Presented to M.G. (Ron) Britton, Ph.D., P.Eng.

Dr. Ron Britton began his career at the University of Manitoba in 1973. Since that time he has distinguished himself with a truly outstanding commitment to research, teaching, and service to the profession. He is deserving of the Merit Award based on both research and teaching accomplishments. His innovative teaching is highlighted both at the classroom level and through his assistance in helping other academics learn how to become effective educators. He has provided national leadership in incorporating engineering design into engineering education. He started teaching engineering design in the first year of the engineering program and has created a sequence of four courses to take students from 'concept to reality'.

Ron Britton, Ph.D., P.Eng.

As well as being an extraordinarily gifted teacher, as evidenced by his consistently excellent course/professor evaluations, Ron continues to incorporate and develop new and innovative teaching methods and technologies into his classroom presentations. He has received the University of Manitoba's highest teaching award – the Dr. and Mrs. Saunderson Award for Excellence in Teaching. He has also received the Western Electric Fund Award given by the North Midwest Section of the American Society for Engineering Education "in recognition of his superior teaching and contribution to improvement in engineering education", and the Canadian Council of Professional Engineers Faculty Teaching Award. Recently, his contributions have been recognized by the Natural Sciences and Engineering Research Council of Canada by awarding him a Chair in Engineering Design.

He has been a driving force in incorporating multimedia based, in-class course delivery packages into the teaching of engineering courses. He was instrumental in the setting up and delivery of a fourth-year engineering design course through live two-way video for students at the University of Saskatchewan in 1996. This delivery system was new to the two universities but Ron said he had been willing to commit the time and energy needed to develop the system.

Dr. Britton maintains an outstanding involvement and interest in working with schools and potential engineering students; actively involves professional engineers in his educational program; provides direct input to off-campus educational groups; serves on committees charged with reducing the biases associated with women in engineering; and regularly writes articles and speaks to the general public in matters related to engineering design and light frame building design.

Underlying all of Ron's professional activities is his belief that there is nothing which a university professor does that is more important than interaction with students. Many successful graduates recognize Dr. Ron Britton as being a major influence in their careers.

Early Achievement Award

Presented to Roger G. Rempel, B.Sc.C.E., P.Eng.

Mr. Roger Rempel received his Bachelor of Science degree in Civil Engineering from the University of Manitoba in 1991. Upon graduation he received the Doupe Memorial Gold Medal in Engineering. He was on the Dean's Honour Roll in 1989-90 and 1990-91. Roger registered as a practising member of the APEGM on October 12, 1993.

Mr. Rempel began his engineering career when he joined TetrES Consultants Inc. in 1990. Roger established his credentials as an environmental engineer early in his career and was named an Associate of the firm in 2000. He is one of the firm's principal contacts for professional services to industry and regulators on air quality management.

Roger Rempel gained leading-edge environmental-engineering expertise in Quantitative Risk Assessment and Hazards and Operability Assessments for industry (air quality assessment, dispersion modelling) through working in a skilled team on challenging industrial projects (studies and engineering reports) and through attending technical seminars and courses on these topics.

Roger G. Rempel, B.Sc.C.E., P.Eng.

He has extensive experience in assessing industrial emissions caused by normal plant processes, fugitive emissions, plant process upset conditions, industrial acci-

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The Communications Committee would like to hear from you. Comments on your newsletter can be forwarded to us through the Association office. Members are also encouraged to submit articles and photos on topics that would be of interest to the membership.

Publications Mail Agreement Number 40062980

New Members Registered January & February 2002

M.E. Antonio (BC)	D.E. Gullacher (SK)	D.G. Murray (ON)
S.A. Bailey	P.M. Halipchuk	T.W. Olson
P.M. Bortolin (SK)	S.P. Halabura (SK)	L.A. Penner (SK)
D.M. Burtt (ON)	P. Harnois (QC)	R.H. Pinon (ON)
Y. Chen	W.R. Huggan (BC)	E.H. Pon (AB)
D.A. Cook (SK)	N.K. Jackson (SK)	A.A. Poulin
H. Deng	A.R. Jennings (ON)	A.D. Saranchuk
K.N. Dexter (AB)	J.S. Jonasson (SK)	E.F.G. Shehata
K.M. Engler (AB)	C.E. Joyal	P.S. Silva
K. Gaudet	K. Ladicani (QC)	R.A. Smith (AB)
J.M. Gee (ON)	D.A. Lee (SK)	B.A. Warkentin
K.M. Girard	S.S.K. Leung (BC)	R.P.W. Yeoh (BC)
P.R.E. Glover (SK)	L.P. McLeod	

Members-In-Training Enrolled January & February 2002

N.J. Banton	G.T. Gibbings	B.J. Madison
G.R. Bisson	A.J. Gies	T.B. Manchur
A.N. Bogdanovic	M. Hamm	R.P. Mejia
J.A. Chimko	R.C. Janzen-Martin	D.W. Oleschuk
J.A. Cutts	D.V. Kaethler	D.A. Siepman
S.M. Dueck	C.S. Klowak	J.D. St.Laurent
T. Dyszy	C.R. Krahn	A.M. Storie
D.A.L. Evenson	M.J. Kroeker	J.J. Szot
E.M. Garlinski	M.K. Kwiatkowski	E.D.J. Toupin
R.F. Gerus	T.L. Law	J.I. Vukelic

Licences Issued January & February 2002

D.M. Honan (NY) C.W. Walker (WI)

Reinstatements January & February 2002

R.T. Bjarnason N.R. Dickey (AB) E.B. Loewen P.G. Smith (AB)
R.J. Blanchard (AB)

Certificates of Authorization Issued

L.A.B. Consulting Ltd.
Lafarge Canada Inc.
Origin and Cause Inc.
Stothert Engineering Ltd.
The Wexford Group
The Sear – Brown Group Inc.

In Memoriam

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

Stephen Ronald Dowhey Arthur David Round

Call for Nominations

The Nominating Committee is seeking nominations for positions that will become vacant on the Council in October 2002. If you know of someone who is capable of participating in the governance of the Association and who is willing to represent the engineering and geoscience community, please submit their names and supporting information to the Nominating Committee. The consent of the nominee must be obtained.

Alternatively, if you wish to nominate someone directly, nomination forms are available from the Association office. The consent of the nominee must be obtained, and the nominator and six other members must sign the nomination form. **Nominations must be received in the Association office on or before Friday, August 30, 2002.** Each completed nomination form must be accompanied by the nominee's resume and platform (preferably not to exceed 100 words). Resume forms, and examples, are also available from the Association office. ■

Executive Director's Message

D.A. Ennis, P.Eng.

Governance Policies

Over the past year the Council has adopted a form of the Policy Governance© model for conducting its affairs. A reception was held for the volunteers working in the committee system on April 19, 2002 which included a presentation on some of details of the Association's new policies and the change that will occur.

The change for the Council is one of focus. It is intended to allow the Council to spend more of its time on the future directions of the Association and less on its day-to day operations through delegation to the staff. It is also expected that there will be a reduced time commitment for Councillors. The focus is that:

- The Council exists to hold the organization in trust on behalf of an identifiable "moral ownership" (the public of Manitoba) and, when it is not inconsistent with the public interest, its membership.
- Council decisions are predominantly policy decisions.
- The Council will define and delegate, not react and ratify.
- The Council speaks to the staff with one voice through written policies, it does not create structures, such as committees, that can interfere with its clarity of delegation.
- The Council controls staff means by limiting, rather than prescribing.
- A key role of Council is determining "Ends" – what benefits the Association is to produce, who the benefits are for, and how much they are worth.

In that context, the Council will have only four committees to assist it in doing its job: Executive Committee (which will be used sparingly); Nominating Committee (to assure governance succession); Discipline Committee; and the Past-Presidents Committee. The other committees currently carrying out the requirements of the Act and assisting in the operations of the Association will be known as "Association" committees and will be in the purview of the Executive Director.

There is much more detail to the concept of this governance system and to the particular policies under which the Association will operate. Changes of this nature will lead to some adjustments in the focus and operations of the Association, which will be introduced over time. Members and members-in-training wishing to learn more about the policies are asked to contact the Association office for a copy. (Note: The document consists of 54 pages.) I especially recommend that members considering placing their names in nomination for election to the Council review the policies.

2002 National Survey

There was information in the February edition of this publication letting you know that CCPE will be conducting a national survey on the engineering profession this year. It will also be obtaining information on geoscientists for the CCPG. To the extent feasible, it will be conducted on-line. Again, we ask that when you are approached you take the time to help in updating the profile of your professions.

National Secondary Professional Liability Insurance

As indicated in the February edition, this Association will be participating in a program of secondary professional liability insurance for all members and members-in-training. It is scheduled to come into effect this month. Members should note that the program provides a "claims made and reported" form of policy, and that, as always with insurance, it has a number of conditions and exclusions in the policy. Copies of the policy will be available. You are strongly encouraged to read it. The program is labeled "secondary" because it will not respond to a claim if other primary insurance coverage is in effect.

With respect to professional liability insurance (whether it is primary or secondary), I remind members that by-law 14.2 provides that before undertaking the provision of professional services to a client (not an employer) each member shall either: have professional liability insurance coverage through a policy held by the member, or his or her employer; or shall notify the client that he or she does not have professional liability coverage. Additionally, if the member is not so insured, before proceeding he or she is required to obtain written authority from the client to provide services on the understanding that there is no insurance coverage.

Member-In-Training Work Place Titles

In the report on the Council meeting presented elsewhere in this publication there is reference to the adoption of a policy on the acceptable use of workplace titles by members-in-training. Under the policy a member-in-training may use a workplace title that includes the term "engineer" or "geoscientist" or any abbreviation or variation thereof if, and only if:

(a) an application to use the term is made by the member-in-training; and

(b) the application has been endorsed by a professional member who is a full time employee of the company and who is in charge of the work of the member-in-training; and

(c) whenever such term is used, it is accompanied by the designation "engineer-in-training" or "geoscientist-in-training" or the abbreviations "EIT" or "GIT".

A further condition is that the authorization of the use of such titles is confined to the workplace and expires when the applicant ceases to be an employee of the company in which he or she was employed at the time that the authorization was issued.

Guidelines – Duty to Report

One of the professional dilemmas that can face a member is whether, when and how to "blow the whistle" when he or she has knowledge of and is convinced that a situation involving engineering or geoscientific work endangers life or property.

Recognizing this, the Practice Standards Committee, in consultation with the Investigation Committee, has developed a guideline to assist in carrying out one's professional responsibilities in such a circumstance. It provides for involvement by the Association in encouraging a remedy and/or notifying the appropriate authority with jurisdiction over the matter. However, the Association would only become involved after the member has taken the required steps and appropriate action has not taken by others.

The guideline is available for comment prior to publication. Members who wish to comment should contact the Association office (preferably by e-mail) for a copy. Comments will be received until May 17, 2002.

The Practice Standards Committee has other guidelines under development and close to being ready for comment. Two such are on "Technical Review of the Work of other Professionals" and "Provision of Mechanical and Electrical Engineering Services for Building Projects". Comment on them will also be invited. ■

Attention MITs!

Looking for Volunteer Service Opportunities?

This Association has created a list of MITs interested in having their e-mail addresses circulated in response to requests for volunteers. If you would like your name added to that list, please call or e-mail Jennifer (***jnreykdal@apegm.mb.ca***) at this office, and she will add your name to the list. ■

National Engineering Week 2002

An Evening of Recognition

Continued from page 1

dents, and accidental toxic releases. He has provided air quality services involving emissions (stack) sampling, co-ordination of emissions monitoring programs and complete emissions characterization to provide industry with the data necessary to make important decisions regarding emissions control strategies and emergency response planning. Software tools play a key role in risk assessment. Roger has used a large array of regulatory-approved models for assessment of industrial emissions to the atmosphere.

The Consulting Engineers of Manitoba recognized Roger in 2001. He shared the CEM Award of Excellence in Consulting Engineering: Award of Merit, Environmental Services "Corporate Risk Management for Industrial Chemical Facilities," with a colleague at TetrES Consultants Inc.

In the area of water-quality assessment and water-supply studies Mr. Rempel participated in the development of a series of linked mathematical computer models for simulation of combined sewer overflow and separated sewer discharges for the City of Winnipeg. He applied a site-specific Urban Land Use/ Runoff Model and ran simulations considering Winnipeg's existing urban land developments and their topography along with periods of actual continuous rainfall records.

Roger Rempel's work in environmental engineering requires effective communications strategies, skills and tools. He has developed Information Management Systems (Intranet) linking offices, mobile computers and personnel across the country for clients. Roger developed one of North America's first Internet Worldwide Websites dedicated to municipal water conservation for the City of Winnipeg. He also developed the acclaimed TetrES Floodzone Website providing information on the 1997 Red River Flood Crisis.

Roger Rempel has authored/co-authored and presented four technical papers to industry, association conferences and seminars, some of which resulted in post-seminar, in-studio interviews.

Roger Rempel is an active member of the CSCE, the Air and Waste Management Association, the Fine Particle Society and the Disaster Recovery Information Exchange (Central Chapter). He is an active member of the consulting engineers' organizations in Manitoba and Canada, serving as Chair, CEM Public Relations Committee from 1999 to the present and as a member of the Organization and Creation Committee for the Awards of Excellence in Consulting Engineering. Roger has been the Manitoba Representative on the ACEC's National Communications Committee since 2000 and is an active member of the APEGM Public Awareness Committee and the Organizing Committee for National Engineering Week.

In awarding the Early Achievement Award to Roger G. Rempel, P.Eng. the Association acknowledges his significant contributions, as an environmental engineering consultant, to society and the engineering profession, in the early stages of a promising career.

Leadership Award

Presented to Madhav N. Sinha, Ph.D., P.Eng.

Dr. Sinha is Chief of Engineering and Technical Services of the Manitoba Provincial Government Department of Labour and Immigration He started his vision of changing the landscape of Manitoba and Canada's industrial competitiveness for making everyone's product and services synonymous with world-class quality, a quarter of a century ago.

In collaboration with University staff, industrialists, government planners, and other interested people, Dr. Sinha has worked hard to bring his dream to fruition.

For over a quarter of a century, Dr. Sinha's leadership legacy has left many landmark creations in the province and in the country. He has established, and helped in the establishment of, many "firsts" in Manitoba and Canada coast to coast. Notably, this help has been in the areas of quality control education and training programs, provincial and Canadian national quality award programs, development of quality management standards such as ISO 9000, quality awareness campaigns, government-wide service excellence initiatives, community quality councils and self-help learning networks. Also, many other such novel initiatives that are aimed at improving and benefiting all organizations – big or small, public or private, for profit or not-for-profit. Economic benefits stemming from organizations implementing quality programs have been estimated to reach upwards of five to ten billion dollars, nation-wide.

Madhav N. Sinha, Ph.D., P.Eng.

Dr. Sinha has also contributed extensively in the field of education and research for quality control sciences, quality engineering and total quality management. He taught at the University of Manitoba's quality management certificate program for fifteen years, and has authored, co-authored and edited ten books on quality, including a textbook, many training manuals, study guides and over 50 research papers that are published internationally – some translated into foreign languages. Known world-wide for his theories of 'systems approach and product and service life-cycle approaches' to quality and other scholarly work, Dr. Sinha is a highly decorated Manitoba professional engineer with many provincial, national, and international awards to his credit. He is the first Canadian elected as Academician with the world's elite International Academy for Quality for being among the best, most active and experienced protagonist of quality, in the world. He is also a

APEGM New Members.

first Canadian ever to be honoured with more than two dozens medals, awards and testimonials from the American Society for Quality and other Canadian organizations; and was listed in the 1993 first edition of 'International Who's Who in Quality' and in the 2000 edition of 'International Who's Who in Public Service' for being an outstanding Canadian in his field of expertise.

Certificate of Engineering Achievement

Presented to The City Of Winnipeg Water & Waste Department, CH2M Hill Canada Limited and UMA Engineering Ltd. for the Rehabilitation of the Greater Winnipeg Water District's Shoal Lake Aqueduct.

The rehabilitation of the Shoal Lake Aqueduct began with a vision and a challenge. The vision was to extend the life of the structure to provide at least another 50 years of service with minimal increases in maintenance and operating costs. The challenge was to plan for nearly ten years of engineering and construction without spending any more than the utility-based fund established for the program. With the program entering its ninth year, it remains on schedule and within four percent of the total program budget.

The program partners used innovative techniques, new technology and an effective risk-management program to extend the life of the Shoal Lake Aqueduct by more than 50 years. At the same time they worked in varied and difficult external environments with minimal shutdowns so as to maintain an uninterrupted supply of water to the citizens of Winnipeg.

The condition assessment and rehabilitation phases of this program have advanced the understanding of asset management, the rehabilitation of ageing infrastructure and the fundamental behaviour of pipe-soil interaction. Virtually every discipline of engineering has been called upon to provide technical expertise to assess the nature of the problems and identify the most cost-effective repair strategies and methods.

During shutdown windows, from as brief as 48 hours to as long as 23 days, inspection teams and contractors routinely worked around-the-clock using a variety of advanced inspection and construction techniques and extraordinarily precise project management to ensure that technical objectives were not compromised in the interest of expediency. Individual repair projects often involved the co-ordination of hundreds of contractors, inspection and operations staff working in brief shutdown windows over many kilometers of the Aqueduct.

Using risk-based design concepts such as limit state analysis, analytical concepts such as expected outcome analysis and incorporating the required emergency response systems into the program, rehabilitation costs were reduced by approximately one-third of the original $160 million estimate and short- and long-term operational risks were mitigated to an acceptable level.

By extending the service life of the Shoal Lake Aqueduct by at least another 50 years, the project has had a profound positive impact on the life and well being of the citizens of Winnipeg. ■

Ron Sorokowski, P.Eng. (l), City of Winnipeg, Don Grandy, P.Eng.(c), CH2M Hill and Chris Macey(r), UMA Engineering accept the Certificate of Engineering Achievement Award.

Manitoba Government Proclaims National Engineering Week

By: B. Stimpson, P.Eng.

At a news conference in St. Vital Centre, Winnipeg, March lst, the Hon. M. Mihychuk, P.Geo., Minister of Industry, Trade and Mines for the Province of Manitoba, signed the first-ever Manitoba government proclamation of National Engineering Week. In her speech the Minister reminded listeners of the important role of engineers and geoscientists. "Engineers design and construct items we use every day, such as telephones, computers, bridges, and the materials used to make them. Engineering Week reminds us how necessary engineers are in making our lives run smoothly. By promoting their many achievements, engineers hope to attract young people to their profession."

Joining her on the platform for this event were David Ennis, P.Eng., Executive Director and Registrar, APEGM, Roger Rempel, P.Eng. of the Consulting Engineers of Manitoba, Inc., and Douglas Ruth, P.Eng., Dean, Faculty of Engineering, University of Manitoba. Each, in turn, spoke of the vital role of engineering in the economic strength of the Province and the part the organizations they represent play in engineering and geoscience. ■

PROVINCE OF MANITOBA

Proclamation

PROVINCIAL ENGINEERING WEEK

Whereas professional engineers and geoscientists strive through their work to benefit society, ensure public safety, and protect the environment; and

Whereas professional engineers apply their knowledge to design innovative products, systems and processes that enhance the quality of life, health and economic well-being of all Manitobans in creative and innovative ways; and

Whereas we look to professional engineers to use their knowledge and skills to resolve the technological challenges that lie ahead for our province, our nation and global partners; and

Whereas Manitoba's professional engineers provide consulting services that are recognized for their ability to adapt to the customers' needs and rank competitively in the world in revenue derived from the export of engineering services; and

Whereas The Consulting Engineers of Manitoba Inc. and The Association of Professional Engineers and Geoscientists of Manitoba are the lead provincial facilitators of the process that ensures excellence in engineering and applied technology for the public of Manitoba; and

Whereas the achievements of Manitoban engineers and the geoscientist profession are truly worthy of celebration;

NOW THEREFORE BE IT KNOWN THAT I, Marylin Mihychuk, Minister of Industry, Trade and Mines do hereby hereby proclaim the week of March 3 to 10, 2002 shall be designated as Engineering Week in Manitoba.

MINISTER

National Engineering Week 2002

Spaghetti Bridges – Done Professionally

By: A.A. Poulin, P.Eng.

St.Vital, Centre court, large stage and professional looking backdrop, large screen TV – this was the setting of the 8th annual Spaghetti Bridge Competition, held on Saturday, March 2, 2002, as part of National Engineering Week activities. Although the event has always been a success, this year the setting was particularly impressive. Thanks to the National Engineering Week (N.E.W.) Committee and Chair Brian Stimpson, high standards were set and St. Vital Mall came through for us. Paul Novak, chair of the venue sub-committee, ensured the competition had center court – a nice large stage was provided and even a video camera and large screen TV from the Sony store to ensure all could see the bridges being loaded. Once again, there was tremendous interest and support for the students and their bridges. Many observers had nothing but positive comments about the competition set-up this year and how professional it all looked.

The competition was open to students from grades one through 12. The goal, to build a bridge that can withstand the highest load, built only of spaghetti and white glue, with a span of 300 mm and weighing no more than 350 grams. Cash prizes of $50.00 were awarded for each grade winner and new this year, two grand prizes of $200.00 each. The grand prizes were awarded to the overall winners from grades 1-6 category and the grades 7-12 category. APEGM also donated tickets to the IMAX presentation of "The Magic of Flight" for each of the winners.

Spaghetti Bridge organizers also devoted much time and effort to the competition – a new test frame was built, both for the competition and to offer a new "In-School Spaghetti Bridge Competition" program for the first time (brochures were available at the competition). Thanks to the support of APEGM and a donation from the Life Members Club, the new test-frame with load-cell and display device are ready to be shared with the schools to run their own, in-school competitions during the year. For rural schools that may not easily get their hands on the equipment, another option was provided – designs for building a wood test frame. The competition itself was operated in a slightly more high-tech fashion; the tests were run by software on a laptop controlling the load readout device. The competition ran smoothly, and we owe a big thanks to Peter Roach (Manitoba Hydro) for all his time spent in writing the computer program to run and compile data from the load cell for the competition.

Attendance was good again this year, a mix of individual and team entries, for a total of 80 bridges tested. They commanded a lot of attention at the mall. The grand prize winner in the grade 1-6 category was a grade 5 team from Dr. Hamilton School, whose bridge broke at 122.29 kg (or 259.6 lbs)! The grand prize winner in the grade 7-12 category was a grade 7 team from École Gabrielle-Roy, whose bridge broke at 74.19 kg (or 163.6 lbs.). The grade 5 entries from Dr. Hamilton School are a well-researched bunch – they have been competing for several years and each class leaves behind their designs and recommendations on a school webpage. One team from this school was also invited to participate in a demonstration of the competition for A-Channel's Big Breakfast, which aired Friday Morning, March 1st.

The Spaghetti Bridge Competition proved to be a successful event for organizers Glenn Penner, P. Eng., Shane Mailey, P. Eng., Don Spangelo, P. Eng., and Adèle Poulin, P.Eng. – all of whom form the Spaghetti Bridge sub-committee (under the N.E.W. committee). Of course, the day couldn't happen without the much appreciated help from: Brian Stimpson, P.Eng. and the N.E.W. committee; Paul Novak, EIT; Peter Roach; Terry Armstrong, P.Eng.; A-Post fabricators; and our competition day volunteers: Tony Huynh, Val Yereniuk, Rebecca Brandt, Ryan Sporns, Wayne Byczek, and Cory Graham. As I was packing and hauling equipment after the event, I heard passing shoppers exclaim to one another, "I never knew engineers could draw so much attention". I think this is a commendation not only to Spaghetti Bridge, but also to the N.E.W. committee, to the collection of professional looking booths, and to all those who helped to make the week a success. ■

In Appreciation of the Video and the Visit with Old Friends

By: Loreen Dunklee

Thank you for the marvellous video that I have watched several times, and for Shirley Matile's article. It was wonderful to see so many old (older) friends, like being at a reunion. Clyde McBain did a masterful job as 'emcee', as he did in many roles for the Association over the years. Clyde is competent, fair, never heavy-handed, and it was a treat to see him (unchanged) with the lovely Vicky. Abe Anhang was the solicitor who handled Donald's estate and helped me enormously through sad times. He and wife Barbara are two of my dearest friends, as are their two children.

George De Pauw became one of my favourite Presidents soon after his election. George would ask for my opinion on some matter (and sometimes I gave it without being asked). Initially we didn't always agree, which was a good thing, because the subject could be aired well and the best solution found, all harmoniously. It was a joy to work with him and for him. What was best for the Association was always the bottom line for George. One of the perks of George's presidency was being invited to the De Pauw home for Sunday dinners, meeting Florence and their children. I was not aware until the December 20th ceremony that George had regarded me as a sort of Mother Superior. Thanks George.

Walter Saltzberg, who has a great sense of humour and a marvellous laugh, took his various roles seriously – particularly when he was President. He did his homework and filled the position with dignity, integrity and style. The versatile Ted Speers was both Registrar and President, worked on several committees and displayed his Thespian talents in the Shakespearean festival.

Fred Jost served for many years on committees and on Council and as he indicated on the video, he and his wife, Toni, and I are dear friends. He was a very solid Councillor, thoughtful, wise, dedicated, and knowledgeable.

Charlie Landon was the first Registrar under whom I served. (1956). He was also on Council and ultimately became President. No one ever watched over the Association more seriously and tenaciously than Dr. Landon. APEM was bound by Bourinot's Rules of Order with which Dr. Landon was familiar. Motions must be put and seconded before they could be discussed. How they could be amended and how they could not. How many times a person could speak to a motion. How items could be added to an agenda. Dr. Landon was a good watch dog. I suspect the Rules of Order are more assiduously followed by lawyers. Engineers tend to talk first, make motions later. Bill Mackenzie was the last Registrar under whom I served, for a year before I retired. He suited the job well and did it well, in the Charlie Landon style, and he was a great "boss", and is still a special friend.

Yes, Carl Anderson, I do remember you. I did not know until you spoke that after you left the Association office to go on a successful job interview, you remained with that firm for forty years, and counting. Memo to Ted Clarke, thanks, it was fine. Memo to Councillor Poetker, you weren't brash, SJA was just experienced enough to recognize potential Council material.

Semi-retired Past President Rudy Isaak spoke of the friend who complained to Rudy that the Bulletin had too much nonsense. After the nonsense was gone Rudy encountered this same individual and asked him how he liked the new look. He didn't know – didn't read it any more. Rudy's hand on the helm was firm and steady.

By way of diversion from things engineering, there was the night of the bloody goose. The Social Committee had learned that giving a live chicken as a prize at the Fall Frolic was very entertaining for everyone but recipient Brian Whitfield who had the chicken eating popcorn on his table all evening and then took it home, later reporting she was a tough old bird. The following year one of the Committee members "borrowed" a goose from a farmer, who said it was a prize goose. The dance was at the fashionable Royal Alexandra Hotel. Early in the evening a member of the Social Committee came to the table where Donald and I sat with friends to ask me to go with him to the "private room" where the goose was cloistered, perched on a bed of straw in a cardboard box.

The problem was one with which I had no experience – the goose was haemorrhaging. Some of the straw and the underbelly of the goose were red. The goose seemed contented, but that was not reassuring. I returned to my husband and friends, but not for long. An emergency meeting of the Social Committee was held around the box holding this prize goose, goose and straw becoming well soaked and red. Lawsuits loomed. Finally it was decided to call a cab and send the goose back to its owner. (There are no minutes of this emergency meeting.) Soon thereafter the cab-driver phoned to say he wanted to check the address in Charleswood because the person at the number he had been given said he knew nothing about any goose. Another emergency meeting. Try again, that's the correct number. No more was heard that evening. The following week we expected to hear from a lawyer or get an invoice for a goose. Nothing. (None of this was in my job description or the terms of reference for the Social Committee.) Toward the end of the week the engineer who had arranged to borrow the goose phoned to say he had heard from the farmer. The goose was fine. It had not been bleeding. Since he was dealing with engineers the farmer decided to inject some excitement into our dance. He fed the goose nothing but beets for several hours before it was picked up on its bed of straw. No more live awards were given.

It was a marvellous job, with endless variety from washing the dishes, being the bookkeeper, babysitting a goose, drafting by-laws, minutes, organizing meetings, taking a turn at being S.J. Armstrong, arranging for elections, and conscripting candidates for committees. When Jack Hoogstraten hired me he said there wouldn't be a lot of work, that I could read or knit, just be there to answer the phone, do the correspondence, the books and the minutes. I reminded Jack of this forecast several times, but we both knew I wouldn't have wanted a job that allowed time for knitting. It was more stimulating to get involved in producing a Bulletin and arranging for the first Fall Frolic. There are problems with any job, but they are more than offset by the good times, problems solved, challenges met, the very special friends I made; engineers I was privileged to work with giving voluntarily of their time in the best interests of the Association. Dedicated, altruistic engineers like Dave Cross, always a pleasure to work with, wearing a very sporty tie on the video sounding very much like himself.

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Council Report

Wednesday, January 16, 2002

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

MEMBERS-IN-TRAINING MAY USE 'ENGINEER' IN JOB TITLES

President Barakat opened the meeting with a few general remarks. He said that since the Council meetings would be shorter, and fewer, Council needed to make faster decisions. He also mentioned an e-mail from former Councillor Eschenwecker who suggested that Council publish a regular column in *The Keystone Professional* to keep the membership informed on current issues before Council. President Barakat said he didn't want to just fill space and repeat what was written in other parts of the KP. Councillor Gaudry said they should throw caution to the wind and try the suggestion.

Council welcomed a new face at the table; Councillor Don Harfield, a replacement for departed Councillor Jerry Bogan, who had gone to seek his fortune south of the border.

Next, the items in the "consent agenda" came up for considerable discussion. The consent agenda contains management items which are delegated to the Executive Director. However, under Policy Governance, Council must approve his actions. Under this heading was a memo listing awards, which were to be presented to members during National Engineering Week. President Barakat wondered if Council should review decisions of the Awards Committee; not doing so would preserve their complete impartiality. Councillor Permut said they would intervene only if the nominees were totally inappropriate, which was certainly not the case with the present list.

The Policy on Member-in-Training company titles was a consent agenda item that had a long run, one which ended at this meeting. It was born when a prominent Winnipeg company wanted to know if the term "engineer" could appear in the job title of an MIT. This led to an opinion from APEGM's legal counsel which said that as long as the MIT was clearly designated as an EIT, "engineer" could be featured in his or her job title. Executive Director Dave Ennis had modified the draft policy to state that APEGM must approve any title before it could be used. President Barakat thought the Association would be inundated with title approval requests if Mr. Ennis's amendment came to pass.

Councillor Harfield thought that overall, the proposed policy was a good compromise, and that the process should be kept simple. Councillor Goldsborough believed they only needed to include the EIT designation, and that title name approval by APEGM wasn't necessary. Councillor Permut also felt that APEGM didn't need to administer names. The discussion was lively, and in the end, Council decided to accept the proposal with the proviso that the MIT make the application for job title personally.

After a brief break in the meeting, Council returned to more unfinished business: the election of a Vice-President. Before Council launched into nominations, Executive Director Dave Ennis informed the gathering that he was nearing retirement age and that he might leave during the term of the next President, who was also the Vice-President they were to elect that day. Mr. Ennis didn't offer this information as an inducement to the latent V.P., but as a "heads up," to let him or her know that selection of a new Executive Director could be part of their agenda. (Mr. Ennis hastened to add that he enjoyed his job.)

All Councillors received small sheets of paper where they inscribed the names of the nominees. After these were duly counted, Councillors Gilmore, Goldsborough, Permut, Silk, and Syme were nominated. One by one the nominees were polled for their willingness to stand for election, and one by one most said no, citing job conflicts or lack of experience. The only exceptions were Councillors Goldsborough and Silk. Councillor Goldsborough accepted and Councillor Silk requested more time to decide. Past President Pollard moved to table the election until the next Council meeting so that the candidate or candidates could learn more about the time commitments a V.P. needed to make. Councillor Poetker ended the discussion by saying that the geoscientists on Council shouldn't rule themselves out for the position on the grounds that they are too new to the job.

The end of the meeting was near when Executive Director Dave Ennis updated Council on the status of the National Secondary Liability Insurance Program. APEGM's membership had approved participation in this program in last fall's letter ballot. Mr. Ennis said that desired changes to the program were complete and it only remained to decide what to do with persons in multiple jurisdictions.

The meeting ended with the obligatory Council self-evaluation. Councillor Harfield wondered if they could have a time allocation assigned to meeting items. Councillor Ferchoff said they were learning, although they still spent too much time on internal issues. ■

Meet Your New Councillor – Allan Silk, P.Eng.

By: M.E. Baril, P.Eng.

Allan Silk, P.Eng., was elected at the last APEGM Annual General Meeting to a two-year term on Council. I had the opportunity to discuss with Allan his background, interests, and goals for his term as APEGM Councillor.

Allan is a Winnipegger born and raised. After graduating from high school, he took the telecommunication course at Red River. After school he worked as an Electrical Technician with CN Telecommunications. He worked with the Telex machines and the weather and police circuits for all of CN in the Edmonton and The Pas offices. He was a high-speed data technician for the 9600 baud network. After working for a while, he decided to go back to school and graduated in 1985 from the University of Manitoba with his Computer Engineering degree. He briefly worked for Cirlog before joining the Micro-electronics Centre, which was a government funded organization affiliated with the U of M and NRC. During this time, he worked on projects for Manitoba Hydro. Allan related that when he first joined the Centre, he found an IBM AT with a 10MB hard drive on his desk and thought he had died and gone to heaven.

When it became apparent in 1988 that the government funding for the Centre was to be cut, he joined Manitoba Hydro, where he still works today. It was also that year that Allan Silk became Allan Silk, P.Eng. At Manitoba Hydro, Allan joined the IT department where he wrote and adapted engineering applications for the use of Hydro's engineers. In 1989 Allan realized two things: he liked electrical engineering, and he really liked a young woman by the name of Colleen. So he acted on both. He began taking electrical engineering courses at the U of M and he married Colleen. In all, Allan took four undergrad courses and three or four post-graduate courses from 1989 to 1993. Both actions resulted in changes in his life.

Allan and Colleen, who is a physiotherapist, met through Scottish dancing and both participated in various choirs. They married in 1989. Since then they have both re-focused their time and effort on their two children, Ian who is almost nine, and Erica who is almost seven. Both children are active in extra-curricular activities with Ian focusing on Cub Scouts and curling, and Erica on Sparks and Irish Dance.

At Hydro, Allan left the IT department and joined the System Performance Department. He is now part of a group of 15 engineers and technologists who create and analyze computer models of Manitoba Hydro's electrical power system. They use the models to simulate the system's response to disturbances such as lightning strikes and downed

New Councillor, Allan Silk, P.Eng.

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The Rush Is On! Highlights from the 2001 Manitoba Mining and Minerals Convention

Compiled by the Mineral Resources Division, Manitoba Industry, Trade and Mines

In spite of low market forecasts in the industry and the impact of unfavourable global economic and political conditions, the 2001 Manitoba Mining and Minerals Convention attracted over 770 delegates this past November. The convention featured 35 presentations and a sold-out slate of property showcases and trade-show booths.

MaryAnn Mihychuk, P.Geo, Minister of Manitoba Industry, Trade and Mines, opened the Convention with the traditional Welcoming Reception. The mayors of Manitoba's mining communities also welcomed delegates, each providing an update on their districts.

Minister Mihychuk announced the inception of a Mining Task-Force, a group composed of four MLAs whose main objective will be to solicit public input on ways to strengthen the industry. The Mining Task-Force will undertake public consultations across the province in February 2002. The Minister also confirmed that direct incentives for exploration will continue, again showing her strong support for the industry and her commitment to ensure that the province remains internationally competitive for mineral investment.

Carlos Morao, Projects Administer for Hudson Bay Mining and Smelting Co. Limited, provided an update on the company's $400 million, six-tiered group of projects that are known collectively as the 777 Project. The project includes two new mines, expansion of the concentrators, expansion of the zinc plant, a new electrolytic cellhouse, and upgrades to infrastructure. The 777 Project has managed to stay on schedule and budget, with four of the projects already completed and operational.

Ric Syme,P.Geo., Director of the Manitoba Geological Survey, presented an overview of the Survey's activities in 2001 and emphasized the importance of partnerships to geoscience studies in the province. This year, more than $1.9 million was spent by outside agencies in collaborative projects with the Manitoba Geological Survey. Collaborating partners included the Geological Survey of Canada, more than 20 mineral exploration companies, 12 universities, and several other provincial government departments. These partnerships played a key role in ensuring that geoscience programming in Manitoba remained strong, relevant and focussed.

The benefits of partnerships were clear from subsequent talks presented under two themes in the "Partnerships: Building on Strengths" session. A 'Geoscience' theme focussed on specific projects that are bringing additional resources and expertise to Manitoba. Presentations on the federal/provincial Targeted Geoscience Initiative in the Flin Flon, Lynn Lake and

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Premier Garry Doer with MaryAnn Mihychuk, P.Geo, Minister of Manitoba Industry, at the Convention opening.

1-in-700 Year Flood: Arbitrary and unacceptable!

By: Dr. J.R.C. Doering, P.Eng.

The Manitoba Clean Environment Commission (CEC), chaired by Mr. Terry Duguid, has concluded its public meetings, which were attended by more than 1000 individuals. The purpose of the meetings was "to gather the views of Red River Valley residents on the two flood protection options for the City of Winnipeg." The two options are Floodway expansion and the construction of a detention facility at Ste. Agathe.

Floodway expansion is just that, a combination of deepening and widening of the existing floodway channel to increase its capacity and thereby reduce the future risk of flooding in the City of Winnipeg. The "favoured" expansion alternative would provide protection for up to the 1-in-700 year flood, while maintaining natural conditions for up to the 1-in-250 year flood. Floods larger than 1-in-250 years would be dammed upstream of the floodway inlet control structure, causing water levels to rise up to five feet above natural. This alternative is estimated to cost about $658 million. A second (larger) alternative would maintain natural conditions for up to the 1-in-700 year flood with emergency protection up to the 1-in-1200 year flood; this alternative is estimated to cost $1.2 billion.

The St. Agathe detention facility would involve the construction of a 25-mile-long dyke across the valley with control structures on the Red, Rat, and Marsh Rivers. This infrastructure would provide protection for all the downstream residents of the valley for up to the 1-in-1000 year flood. On the upstream side, artificial water levels would only occur for floods larger than that experienced in 1997 (approximately 1-in 90-years). The detention facility would cause water levels to rise about 8 feet above natural to protect against the 1-in-1000 year flood and would prolong the recession of flood waters in the United States. The cost of this alternative is about $543 million. Once the reservoir behind the detention facility is full, it offers no additional benefits to the downstream residents.

The Clean Environment Commission heard submissions regarding compensation, the Terms of Reference for the study, operation of the floodway, and other flood protection options. One of the misconceptions that still exists is the belief that basin storage could be used as an flood protection option. While there is no question that the construction of dams throughout the Red River basin would be useful for mitigating small floods, ensuring minimum flow requirements, and improving agricultural production, there simply isn't sufficient storage to significantly mitigate a large flood in Winnipeg. Suprisingly, the commission heard relatively little about an acceptable level of future flood risk for the City of Winnipeg. Yet this issue is arguably one of the most important for the future economic development and growth of Winnipeg.

In 1958, the Royal Commission on Floods recommended the construction of the Red River floodway, Portage diversion, and Shellmouth Reservoir to reduce the future risk of flooding in the City of Winnipeg. Why? Because a subsequent flooding of the City of Winnipeg would surely have extremely serious economic consequences for the City and the Province. One way to quantify the flood damage risk to the City of Winnipeg is to consider the average annual damage. The average annual damage combines the probability of occurrence of floods larger than the current level of protection with the damages that could occur. Given the current level of flood risk, it is estimated that the average annual damage, excluding business losses, is between $50 to $75 million. Therefore, for every year that Winnipeg's flood defenses stay the same, $50 to $75 million should be banked (on average) to repair future flood damages. This is an astonishing amount and underscores Winnipeg's inordinately high risk to severe damages as a result of flooding. With the present infrastructure, there is a 60% chance in the next 100 years that Winnipeg's existing flood defenses will be overwhelmed. If an 1826 magnitude flood were to occur with the present infrastructure the result would be the flooding of 95,000 homes and the evacuation of 300,000 people from Winnipeg.

The adequacy of protecting the City of Winnipeg with an expanded floodway capable of mitigating up to the 1 in 700 year flood needs to be re-addressed. Over the next 100 years, a 1 in 700 year level of protection has a 13% chance of being exceeded. Given the consequences of flooding the City of Winnipeg, this risk is unacceptable. It's unacceptable by many international standards and it should be unacceptable by our standards. To reduce the risk to a few percent requires protection to at least the 1 in 5000 year flood level. One of the strongest technical arguments for selecting floodway expansion over a detention facility at Ste. Agathe is that floodway expansion is not limited to the 1 in 1000 year level of protection.

Some might say that protecting to the 1 in 700 flood is sufficient, as an event of this likelihood is remote. True, but unlikely things do happen. In the summer of 1993, the City of Winnipeg received two 1 in 100 year rainfall events as well as a 1 in 10 year rainfall event. The combined probability of these rainfall events is about 1 in 715 years. To inadequately protect the City of Winnipeg against large floods is to court disaster. We need to plan for the unlikely and we need to do it now.

Now is not the time for complacency. There is too much at stake. But if we don't start thinking beyond the 1 in 700 year level of protection currently being advocated then we'd better start banking

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CIM Led Industry Committee to Establish Best-Practice Guidelines for the Estimation of Mineral Resources and Mineral Reserves

In June 1997, the Ontario Securities Commission (OSC) and the Toronto Stock Exchange (TSE) established the Mining Standards Task Force (MSTF). In their final report, "Setting New Standards", dated January 1999, they recommended that the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) expeditiously develop national best-practice guidelines for the conduct of mineral exploration programs, development programs and mining operations. Pursuant to this recommendation the CIM has formed a committee to develop guidelines for the estimation of mineral resources and mineral reserves. The guidelines are intended to foster greater standardization of reporting and provide a benchmark for both companies and Qualified Persons (QP) in discharging their responsibilities.

Mandate and Scope of Work:

Prepare a report of proposed guidelines for the estimation of mineral resources and mineral reserves for industry comment. Compile, assess and incorporate, as appropriate, comments from broad industry circulation on the proposed guidelines. Prepare a final report for adoption by CIM Council and incorporation in the CIM Industry Standards. The guidelines will cover metalliferous minerals, industrial minerals, diamonds, coal and oil-sands. The guidelines will be in table format and will recommend key activities that should be part of a best-practice program. The guidelines will foster greater standardization of reporting and provide a benchmark for both companies and Qualified Persons in discharging their responsibilities.

You are invited to review the Draft Guidelines and e-mail your comments to estimationguidelines@cim.org

The notice is posted on the CIM website at www.cim.org. Once at the site, select "committees", "special", and "estimation guidelines committee" and it will post the above notice with guidelines. The results of this are likely to become adopted standards for Qualified Persons operating in Canada and participation by all geoscientists is recommended.

J.W.P. Lengyel, P. Geo. ■

Members-in-Training 2nd General Meeting

By: J.A. Blatz, P.Eng.

The Masonic Conference Centre was a busy venue on the evening of January 16, 2002. The Canadian Public Works Association was holding a dinner while APEGM was holding its second Member-In-Training (MIT) Information Session in the adjacent room.

The MIT information session was organized by the new and active MIT Committee to provide a forum for both MITs and supervisors to discuss issues regarding the APEGM Pre-Registration Program.

The committee started the meeting shortly after 7 p.m. with approximately fifty participants, including MITs, supervisors, and Experience Review Committee (ERC) members. The MIT Committee described achievements to date in the areas of collaboration with supervisors, sample progress reports, and recent changes to the Pre-Registration Program where now a portion of the profesisonal service (PS) activities may be gained from community service (CS) activities. The Committee also touched on its ongoing initiatives regarding EIT/GIT titles, voting for MITs, a revised reporting form for graduate students, and a supervisor survey. Following the formal presentation, Fariborz Hashemian, the MIT Committee chair, opened the floor for discussion.

This article highlights a few of the key points discussed during the question-and-answer period. For more detail on the events and discussions held at the meeting, please contact the MIT Committee chair via the APEGM office.

1. **Delinquent Supervisors –** it was clear that there was considerable disappointment from all sides with supervisors who do not submit their reports on time. It was noted that if a supervisor was chronically late, the MIT would not be receiving feedback as to the acceptability of his or her PD and PS, and may end up losing time as a penalty for not complying with the annual PD and PS requirements. This issue was of concern, considering that registered members are expected, according to our Code of Ethics, to support the advancement and professional development of members-in-training. APEGM continues to seek new ways to encourage delinquent supervisors to reply more promptly. One suggestion was to publish the names of supervisors with outstanding reports (more then 6 months) in the Keystone Professional.
2. **Late Reports –** considerable discussion surrounded the topic of late experience reports. Both supervisors and MITs made the case that the loss of experience resulting from breaking the eight-month reporting rule (where reports must be submitted within two months of completing six months of acceptable work) was not a fair penalty. There was some criticism of the fact that the MIT may receive credit for pre-graduation and pre-enrollment experience from years ago, but not from ten months ago because the report was not submitted on time. The ERC representative made the case that the engineering experience that was taken away for late reports was not in fact questioning the quality of the experience. The justification and rationale for the eight-month rule is currently under review.
3. **Acceptable Professional Service (PS) –** a number of MITs had specific questions about the professional service requirements of the program. The Director of Admissions encouraged MITs who feel that their PS was not appropriately recognized to write letters providing more information on the activity in question, and clarifying why their PS should be counted. A number of MITs also indicated that it has been difficult to obtain the amount of PS necessary to stay in compliance with the program.
4. **MIT Titles –** although not one of the strongest topics of the evening, it was definitely one of interest. The Committee opened the floor for suggestions as to what title might appropriately reflect the status of an MIT without using the words 'in-training', which was considered by some to be demeaning. Many suggestions were presented such as "articling engineer", "junior engineer", and "intern engineer", although none garnered any great support. This item is an ongoing business item for the MIT Committee.
5. **MIT Voting –** Considering the responsibility that MITs are expected to undertake in their professional development, the MIT Committee felt that MITs should be able to vote in the business of the Association. A quick hand-vote in the meeting showed that those in attendance certainly agreed. It was pointed out that this would require changes to the legislation and that the MITs should not expect anything to happen quickly.

It was clear that many issues of interest had been brought forward during the meeting. It was also clear that the program is in a constant state of review to ensure that it is meeting the needs of the Association, with the MIT Committee representing all MIT's during discussions on how the program should be changing. Look forward to another general meeting next year! ■

In Appreciation of Old Friends

Continued from page 7

I regret not having been well enough to attend the ceremony on December 20. Those of you who know me well will realize that I must be far under the weather when I tell you that I am not well enough to advise the feds in Ottawa that I take a dim view of sending our forces to a desert in jungle togs where they may wrap themselves in sand-coloured blankets, or try to paint out the trees on their uniforms and helmets.

As I watch the video I am reminded of the expression which I won't try to quote in French – "the more things change the more they stay the same" and I think it applies to people as well. I believe we get more like ourselves as we age. I do. Bob Stokes bounces in front of the camera to bring cheery greetings just as he used to bounce into meetings, brightening the scene. Shirley Matile was a class act when I first met her and is even classier now. In my day Dave Ennis, although very busy with a full-time job and doing much solid volunteer work for the APEM, always had time to be pleasant and helpful. Very conscientious, Dave served on committees with serious agendas, not those lightened with live chickens and Shakespearean drama. I'm sorry I can't mention everyone who added so much to my life, particularly after I lost Donald, but you know who you are, and one of you is Carson Templeton (with Laurie) living in Victoria.

I missed Doug Grimes from the scene and was pleased to see Liz with the McBains. Doug and Clyde McBain were close friends, and, together and separately, they did good deeds for the APEM. They supported the various functions and enhanced the profession they served.

I heard from Les Wardrop, Garland Laliberte and Ken Buhr who were away on December 20. Les wrote that he is 86, lives alone on the family farm at East Selkirk and, weather permitting, golfs 18 holes twice a week at St. Charles (no cart). Les Wardrop followed Len Bateman as President. Len was recycled and back on Council much later. On the second go-round during a sticky situation, he came to me for advice – and he took it. I saw Bill McKay on the video and heard from him. He has aged somewhat since I first encountered him in Sunday School in Portage la Prairie. Moi aussi.

My thanks and appreciation go to Roger Rempel, P.Eng., who videotaped the event. Complete with captions and background music it is very professional.

We pass this way only once, and I am thankful that I spent nearly thirty years in the work-force with the Professional Engineers in Manitoba. It was an interesting, challenging and stimulating job, bringing me in contact with interesting, challenging and stimulating people. I have a storehouse of memories of Council and committee meetings, work done, problems solved, good-natured arguments and much good humour. I am grateful to those of you who did so much to enrich my life and bequeathed me so many heart-warming memories to draw on at age 80. It was a beautiful experience being married to an architect. It was a gratifying, varied and rewarding experience to work for engineers.

Yours, with much appreciation and affection.

Loreen Dunklee ■

Professional Development

Status of Planning for Future Hydroelectric Developments in Manitoba

By: H.M. Turanli, Ph.D., P.Eng.

The subject of future hydro developments in Manitoba attracted nearly 100 engineers, geoscientists and other professionals to the APEGM Professional Development luncheon on January 16th, 2002 at the Viscount Gort Hotel. The speaker was Mr. John W. Markowsky, MBA, P. Eng., Manager of the Major Projects Planning Department at Manitoba Hydro.

Mr. Markowsky explained that Manitoba Hydro's resource-planning-process starts with the development of a menu of resource options. Manitoba Hydro is always undergoing planning activities for new generation options such as hydro-electric, gas turbines, coal fired, demand side management, and other options such as fuel cells, wind, etc. Other planning activities include site studies, engineering, resource planning, environmental studies, etc.

Mr. Markowsky then introduced potential Manitoba Hydro generation resources including existing and committed projects. Planned additions and retrofits of grid-connected generation are mainly single-cycle combustion turbines (SCCTs), fuel switching from coal to natural gas, with some alternate energy projects in Demand Side Management and System Efficiency Improvements.

Manitoba Hydro is studying the possible development of new hydroelectric generating stations in northern Manitoba. Three sites are under consideration: Gull Rapids on the Nelson River, Notigi on the Rat River and Wuskwatim on the Burntwood River. Construction costs, including the transmission cost, would be approximately $0.5 B for Notigi, $1 B for Wuskwatim, and $3 B for Gull. Additional CTs with a generation capability of 140-280 MW would cost about $0.1-$0.2 B. A larger hydroelectric plant at Conawapa (also under consideration) would cost about $5 B including transmission to the load centres in the south.

John Markowsky, P.Eng.

The necessary community consultation, engineering, and economic and environmental studies are currently underway to maintain critical planning milestones. Stage IV engineering studies, geological field explorations, field environmental studies, and discussions with federal and provincial governments have been ongoing. The environmental application proposal form has been filed and a public information program has begun for the Wuskwatim project.

The work on these potential hydroelectric generating stations represents a fundamental change in Manitoba Hydro's relationship with Cree Nations. Manitoba Hydro is engaged in a collaborative planning process with the Nisichawayasihk (formerly Nelson House) Cree Nation with respect to the Notigi and Wuskwatim projects and with the Tateskweyak (formerly Split Lake) Cree, War Lake First Nations, York Factory and Fox Lake First Nations on Gull project. The current planning process includes a joint environmental discussion, employment and business opportunities, including the possibility of equity participation by First Nations in the projects.

In late 2000, that process led to a historic agreement in principle between Manitoba Hydro and the Tateskweyak Cree First Nation and, potentially, other Cree Nations within the Split Lake resource-management area. A similar agreement in principle was approved by the Nisichawayasihk Cree Nation and Manitoba Hydro in the fall of 2001.

While Manitoba Hydro continues to study the three potential projects, no decision has been made to proceed with the construction. The next major milestone is to submit the environmental impact study (EIS), for Wuskwatim, to the appropriate provincial and federal regulatory agencies. Final project development agreements have to be finalized between Manitoba Hydro and its potential partners.

The earliest any construction is expected to begin is the winter of 2003/ 2004, with the earliest in-service date for Wuskwatim in 2009 and Gull Rapids, 2012. The last slide of Mr. Markowsky's presentation stated " Planning major projects in this new Millennium is a challenge." He explained that this was captured by the Chinese ideogram for Challenge, which is made up of two characters. The first character alone means danger or threat while the second character means opportunity. Our speaker concluded by stating that Manitoba Hydro looks at the current planning for future developments as an opportunity for Manitoba Hydro, its potential partners, and for all of Manitoba.

For more information on the steps involved in "Building a Generating Station", please visit ***www.hydro.mb.ca*** under What's New. ■

Alternative Energy: Power Options for the 21st Century

By: T.S. Rumbal, EIT

As our society's energy needs increase, our reluctance to implement additional non-renewable, conventional energy sources also increases. To meet the ever-growing need, we need to look at other means of generating the energy we require. Some of the options that are being considered to meet this demand were discussed by Mr. Tom Molinski, P. Eng. at the Viscount Gort on March 1st in his presentation, Alternative Energy: Power Options fort the 21st Century. Mr. Molinski looked at various sources of renewable energy, their benefits and challenges they have yet to overcome. His position at Manitoba Hydro is Supply Side Enhancement Engineer in the Resource Planning & Marketing Department. The following article looks at some highlights of his presentation.

Defining Alternative Energy and Green Energy

Alternative energy is defined as a non-conventional energy source. Examples of alternative energy would be; wind, fuel cells, bioenergy, microturbines, Stirling engines, solar, geothermal, and ocean energy. The alternative energy examined in the presentation would be considered 'green' energy, which is defined as being renewable with minimal impact on the environment.

Finding Alternative Energy

The drive for finding these alternative energy sources comes from the threat of global warming, the need to reduce pollution, the desire for more diverse energy sources (energy security), public and government moral support, and rising energy requirements from the developing world.

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Tom Molinski, P.Eng.

An Introduction to Micromachining and Nanotechnology, and the Nano-Machining Laboratory at the U of M

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

On Wednesday, February 13, 2002, Dr. Cyrus Shafai, Assistant Professor, Department of Electrical and Computer Engineering, the University of Manitoba, woke up early to deliver a first of its kind presentation to the sleepy APEGM professional development breakfast meeting crowd. Those of us who weren't awake at the start, were certainly jolted into the 21st century by the image of an ant (magnified to be as large as you or I) spinning a tiny gear on the end of its outstretched finger. It felt as though that ant was looking right through you; it knew something that you didn't: micromachining is happening at the U of M.

Prof. Shafai took the audience on a high level walk-through of some of the micro-electro-mechanical systems (MEMS) technologies being studied, or soon to be studied, at the University of Manitoba's new $2M, 6000 square-foot nano-machining laboratory.

MEMS technology permits mechanical devices to be fitted onto a chip. Micromachined devices are fabricated in a "layer-etch-layer-etch" manner by stacking layers of planar coatings of different materials which are selectively etched in precise locations.

In addition to the obvious reductions in size, exceptionally low mass and fast thermal response have transformed even the humble cantilever into remarkable new engineering and scientific tools. By measuring the deflection of a micromachined cantilever, many new passive devices are possible. Several examples were presented: on-chip "gyroscopes" made up of suspended comb capacitors and used as "roll-over" sensors in automotive safety systems, implantable pressure sensors, thermal sensors comprised of thin films highly sensitive to incident thermal energy, scanning probe atomic force microscopes, thermal gas flow sensors, highly linear ac power sensors based on resistive heating, and incandescent pixels. Perhaps the most memorable of Prof. Shafai's passive device examples was the "nanomechanical nose" through which molecules bond to silicon cantilevered beams. Different cantilevers can be made attractive to specific DNA codes and proteins. Chemical analysis of the gas is done mechanically by measuring the deflection of various beams.

Biomedical applications were highlighted during the talk. These included: bioelectric interfaces (micromachined probes can be inserted into the nervous system or into individual cells for the delivery of drugs or chemical analysis), and micro-fluidic systems (capillary fluid filters) comprising what has come to be known as the "lab-on-a-chip": DNA separators, red blood cell separators, toxin detectors. One commercial product mentioned during the talk allowed for blood analysis in two minutes using only two to three drops.

David Swatek (l) of the Professional Development Committee introduces Dr. Cyrus Shafai.

Active devices can also be fabricated in this manner. Examples include: switches and relays capable of routing electrical signals with near zero insertion loss, actuation using microgears such as the microscopic drive gears and linkages used in pop-up silicon mirrors for on-chip optical switching, torsional on-chip mirrors for projector displays with actuation provided by electrostatic magnetic forces (2 million mirrors per device), and active conformable surfaces for aircraft (tiny actuators on the leading edge of the wing) to improve maneuverability and reduce drag.

Currently, the U of M's nano-machining laboratory is capable of producing roughly half of the technologies presented in this morning's talk, but future upgrades are in the works. We can be certain to see smaller and smaller things from the nano-machining laboratory at the University of Manitoba. ■

Meet Your New Councillor – Trevor Cornell, P.Eng.

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

Our new Councillor started his engineering studies at the University of Leeds where he earned a B.Sc (Hons) in Mechanical Engineering. He then took a course in Management Studies at Leeds Polytechnic/ Bradford College.

He worked for a number of companies in England, including Phillips Domestic Appliances and United Glass, before coming to Canada in 1980 to work for Versatile Farm Equipment on Clarence Avenue.

In 1984, Trevor joined the Industrial Technology Centre as a mechanical engineer, and is now Chief Operating Officer. ITC engages in such activities as product development, product/material testing and vibration/noise analysis. The Centre has recently installed a new Virtual Reality Centre.

Trevor was an avid squash player at one time but, latterly, has turned to golf. This seems reasonable for a man with six grandchildren.

As a Councillor, Trevor will be attempting to accomplish the following:

1. Help chart the future for the Association.
2. Help raise the stature and profile of the Association.
3. Attract young people to the profession.
4. Help increase awareness of the profession within the school system.
5. Help Manitoba industries, especially those attempting to become "hi-tech". ■

Councillor, Trevor Cornell, P.Eng.

THOUGHTS ON

Design

... if something can go wrong, it will.

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

In his book, Design Paradigms, Henry Petroski notes: "It was clear even two thousand years ago that knowing what went wrong in a design was perhaps even more important than what went right." Put another way, it is clear that we learn from our mistakes.

Obviously design is about making things work. It involves interactions, both trivial and complex, of an almost limitless list of often conflicting criteria. When you consider the potential "pot holes" in the road to completion, the fact that most designs function as intended is a tribute to the skill and the knowledge resident in the profession.

But the skill and the knowledge must come from somewhere.

In research projects that are conducted to provide design information, the items under test are intentionally pushed to failure. Specific inputs are identified, isolated and then varied across the test program. The manner in which failure occurs is closely monitored and exhaustively analyzed. This provides a better understanding of how isolated inputs affect system performance at the limit. A bank of knowledge can be built up for use in defining design limits that ultimately become codes and standards. That bank of knowledge amounts to studying "what went wrong".

If laboratory tests provide controlled input, failures of products in the field provide unintended experiments. Design engineers need to use these situations to add to the bank of knowledge that will improve the chances of avoiding a recurrence. Within the commercial world, the immediate pressure is to fix it, not analyze it. As understandable as that pressure is, it is also short sighted.

These unintended experiments, in the jargon of researchers, are truly uncontrolled experiments. The laboratory situation of varying only one input at a time, and thereby minimizing the complexity of input interaction, simply doesn't happen. The luxury of controlling and monitoring load inputs is unavailable. Typically the nature and magnitude of the inputs are as difficult to assess as is the cause of the failure. But the unintended experiments are reality, not controlled observation. They provide us with the opportunity to expand our knowledge base and improve the reliability of future designs.

OK, we can do controlled laboratory experiments and assess real-world failures to improve our knowledge about any given situation, but we will never have the resources to study every possible combination of circumstances to define every possible situation to avoid all potential failures. And that is where the skill of the design engineer comes to the fore.

Using the product-specific knowledge obtained from experiments, both intentional and unintentional, and functioning under the minimums imposed by Codes and/or Standards, design engineers produce solutions to problems. The skill comes in integrating all of the controllable variables and differentiating between those that are critical and those that simply are. That skill is sharpened by understanding what can go wrong.

Yes, design is about making things work. It is also about going beyond what was previously thought to be the limit. If we stay within the boundaries of "what went right" we will not progress. And only by understanding "what went wrong" in previous systems can we push the boundaries with new and innovative designs. ■

The 2001 Manitoba Mining and Minerals Convention

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Leaf Rapids regions clearly showed the benefits of such collaborations to mining communities in the north. The second theme, 'Working With Communities', focussed on how building and maintaining positive relationships between aboriginal and mining communities can provide sustainable economic growth and great returns on time invested. A presentation by De Beers Canada Exploration Inc. emphasized that the goal is to involve local communities and develop long-term relationships such that all parties benefit if exploration is successful and a mine established.

Other talks dealt with renewed interest in the mining sector generated by the new Federal Flow-Through Tax Credit and some Manitoba mining success stories. Highlights were INCO's Birchtree Mine deepening project in Thompson, a $70 million undertaking that will extend the mine's life by about 15 years, and Tanco's successful tantalum project.

One of the highlights of the convention was a session on diamond exploration. This well-attended session emphasized the high prospectivity of Canada and Manitoba for diamonds. One presentation by a leading mining analyst showed that Canada is not only geologically and geo-politically prospective for diamonds, but is primed to be among the top five diamond-producing countries of the world. Several presentations of new geological data – including kimberlite indicator mineral survey results, Quaternary till stratigraphy in the Hudson Bay Lowlands, and the structural make-up and evolution of the northern Superior Province – showed that a large area in the Knee Lake region has high diamond potential. The amount of ground under exploration permits and claims is the highest in over four decades.

Platinum-group metals (PGMs) continued to draw attention as demand and exploration for these metals continues to increase. Several talks presented the latest information on PGM occurrences in Manitoba and emphasized the potential for new PGM discoveries. Manitoba has many of the geological features of PGM properties now being actively explored in Ontario and the expectation is that similar exploration levels will eventually occur in parts of Manitoba.

Technical presentations concluded with a workshop discussing post-Precambrian tectonism and magmatism in western Canada and the implications for a variety of new mineral deposit types in Manitoba. Although participants agreed that this represents a potentially important field for exploration in Manitoba, exploration activity has been slow so far due to a lack of viable exploration models.

Once again, keynote speakers attracted large turnouts. At Friday's luncheon gathering, Manitoba Premier Gary Doer discussed Manitoba's solid economy and how the provincial government will continue to work with stakeholders to maintain a strong local mineral industry. Saturday's CIM Luncheon, closing out the convention, featured an address by Wayne Fraser, P.Eng., Director of Environment for Hudson Bay Mining and Smelting Co. Ltd. Fraser described how developing and implementing mine-closure plans can have a positive effect on a company's bottom line, as well as positive results for the environment. His presentation highlighted some striking "before and after" shots of remedied HBMS mine sites.

Plan to attend the next Manitoba Mining and Minerals Convention, November 14-16, 2002. ■

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Alternative Energy

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Factors that assist the drive for these alternative sources is; R&D, technological advances, subsidies or tax credits for green power, and deregulation.

There are however several barriers to the implementation of alternative energy sources. Alternative energy has a higher cost than conventional energy sources. The infrastructures presently used are not conducive to many different small-scale energy sources being linked together. There are administrative barriers to implementing alternative energy. Many of the alternative energy sources can only provide intermittent energy. Incentives that may presently be in place to encourage implementation may not be available in the future. There is also a lack of familiarity with the equipment needed for producing alternative energy sources.

Wind Energy

Wind energy is one example of a technology that has made great improvements over the past 12 years. In 1990, a 200 kW turbine had an installed cost of $3500/kW while in 2002, the 2MW wind turbine, now available, has an installed cost of $1500/kW – less than half the cost twelve years ago.

The environmental advantages of wind energy are that it is renewable, has no fuel costs, and emits no greenhouse gases. The financial advantages in using wind energy are that the turbine approach is modular, has a short lead-time, and is commercially available. Not only does it have reasonable energy-production costs, but is also a good source of employment.

Conversely, there are disadvantages to using wind energy as an alternative. Though the cost of this energy is reasonable it is still relatively high as compared to conventional energy sources. The technology is, for the most part, environmentally friendly, but still has a visual impact due the number of turbines required. Other problems presently faced are the fact that this is an intermittent energy source and the equipment can be difficult to maintain due to the 70m height of modern towers. In spite of some of the problems with wind energy, studies show an exponential growth in the use of wind as a means of generating power.

Fuel Cells

A fuel cell converts chemical energy into electricity by utilizing hydrogen as the fuel and oxygen from the air.

At present there are several problems associated with the wide-scale implementation of fuel cells. They are expensive, not fully commercialised, and do not have proven durability; something which can only be determined after long-term use. Some are sensitive to carbon monoxide impurities and cold-weather starting is a problem. They have poor load-following capabilities, where the cell is slow to adapt to changes in loading.

The Use of Hydrogen as a Fuel

The use of hydrogen as a fuel in general has several advantages. Hydrogen is an almost limitless, non-toxic source of energy that can be produced via renewable energy resources. Hydrogen will dissipate quickly if a leak occurs during storage. It has very low emissions when combusted in reciprocating or turbine engines.

Hydrogen, like any source of energy, has its problems. Since hydrogen is not naturally occurring, it is relatively expensive to produce, requires massive R&D investment, and requires large-scale production to reduce its cost. Another problem is that its low-energy density makes it difficult to store. Hydrogen is also highly explosive, produces an invisible flame, and requires new safety codes, standards, and infrastructure.

Use of Hydrogen Fuel Cells

Soon fuel cells will be capable of powering homes, offices, laptop computers and cellular phones, and they will likely play a significant role in powering vehicles.

Bioenergy

Bioenergy uses biomass in either solid, liquid, or gaseous form. Biomass can be vegetable matter, animal waste, or waste products. Bioenergy is renewable in that it involves a closed carbon cycle (carbon gets reused in growing new biomass after being released). Bioenergy can be created from biomass by direct combustion, thermochemical conversion (pyrolysis or gasification), or biochemical conversion (fermentation or anaerobic digestion).

The advantages of bioenergy are that it is renewable and abundant, and can utilize waste material in small energy plants using existing technologies.

The problem with bioenergy is that it's labour intensive to grow and to transport the energy crops. For large-scale plants, the crops must be located nearby. The energy density of biomass is still less than that of coal.

Solar Photo Voltaic Cells

Solar photo voltaic cells directly convert solar energy into electrical energy using solid-state electronic devices for conversion. This energy requires no fuel, very little maintenance, and can be incorporated into building structures.

The drawbacks of utilizing solar energy is that it is expensive (though the cost is decreasing), has a low capacity factor, and being daylight dependent, is an intermittent energy source.

Energy Storage

Improved means of storing energy will be useful, especially with the increased utilization of intermittent energy sources. Improved storage also means better emergency backup during brief interruptions. Green power sources are made more dispatchable by improved energy storage devices.

Some examples of energy storage devices would be flywheels, batteries, supercapacitors, super conducting coils, reversible fuel cells, pumped hydro, compressed air, and thermal storage.

Alternative Energy Trends

The overall trend is that the cost of alternative energy is going down. In Manitoba, some of the alternative sources being considered were wind/diesel, wind/fuel cells, and bioenergy. At present, Manitoba receives 97% of its energy from hydroelectric power. ■

New Councillor Allan Silk, P. Eng.

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power-line-towers on the 100kV and higher lines. They analyze the effects and develop "war" strategies to be implemented should such a situation arise.

Allan has volunteered his time with APEGM since 1993 when he joined the Experience Review Committee. During his time on the ERC, Allan was Committee Chair for four years. He also spent three years on the Nominating Committee. He has always enjoyed his time volunteering with APEGM, and after turning down the nomination for Councillor last year due to a heavy work schedule, he accepted the nomination this year. Allan's largest area of interest on Council is promoting the Association's role to engineering students and graduates who have not registered with the Association. He is concerned by the statistic which shows only 59% of engineering grads are registered members of the Association. Another concern of his is why more companies don't require that their engineers register, as is called for in the Engineering and Geoscientific Professions Act. Allan hopes to raise awareness of the Association amongst the students while they are still in school, and help educate companies and organizations about the benefits of enrolling their employees. An interesting fact raised by Allan is that medical students are members of the College of Physicians as soon as they join medical school, before they even take their first class.

Allan is enjoying his time on Council and has been impressed with the governance model implemented by Council and the absence of micro-managing. They are able to focus on the major issues and leave the minor issues and details to the APEGM staff. Allan also really enjoys the spirit of co-operation he found on Council. Everyone chips in to get things done and shows a real interest in the Association. After talking with Allan it is evident he is enthusiastic about the Association and its mandate, and enjoys the time spent to further our Profession. He also appreciates the support he receives from his family and workplace in facilitating his efforts towards the Association. ■

1-in-700 Year Flood

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that $50 to $75 million dollars each year because we're probably going to need it. The decision to expand the floodway to the 1 in 700 year level should be considered nothing more than an intermediate step towards a much higher level of flood protection. A larger flood is not a question of "if" but "when". The cost of adequately protecting the City of Winnipeg will be small in comparison to the true cost of rebuilding it. ■