THE MANITOBA
Professional Engineer
ASSOCIATION OF PROFESSIONAL ENGINEERS OF THE PROVINCE OF MANITOBA
February, 1991

Power-line Maintenance: the Modern Way

By: V.L. Dutton, P. Eng.

No, this is not about the Hydro line running down your back lane. It's about the 450 kVA DC line running from the Radisson Converter Station, near Gillam, to the Dorsey Converter Station near Rosser; or Calgary Power's lines in the Rockies; or the line from the Bonneville Dam in Utah. Big stuff and, in Manitoba's case, lines through muskeg country that make surveillance and maintenance as tough as it comes.

Until now, patrolling, and maintaining, these lines has been done by means of a suspended work-platform that rolls along the conductors. Looking at the sag between adjacent pylons, the crew in the suspended "basket" might be forgiven if they became seasick as they moved along the cable.

Enter the Haverfield Corporation from Florida, with a Canadian division based in Vancouver. Bring along a five-bladed Hughes helicopter with a competent pilot. Mount a platform on the skids with a Honda generator, air cylinder and other "gadgets" on one end and a seat for the technician on the other. Garb the technician in a metallic suit - hood, jacket, trousers, gloves, and socks. Equip him with a "grounding" wand and cable for ensuring that the helicopter is at the same potential as the line. Round out the team with a maintenance mechanic for the helicopter.

Some 75 people watched the "demo" at the site north of the Dorsey station – personnel from both Manitoba Hydro and Winnipeg Hydro, the Ministry of Transport, and consultants, rounded out with a CBC crew and the ambulance team from Stonewall with, of course, several of the front-office chaps from Haverfield.



Spacer-damper demonstration – Haverfield demonstration, August, 1990

The choice of days could not have been better - sunny, with a breeze from the south that kept the flies away. No mosquitoes, of course, because of the drought. The Haverfield crew found it almost chilly as they had just come from a job in Georgia where the heat must be not unlike what the Americans are now encountering in The Gulf. The Haverfield crews have worked at temperatures as low as seven degrees below zero Fahrenheit (whatever that converts to in Celsius) but, with no doors on the Hughes, the pilot has difficulty keeping warm at such temperatures and, as you can well imagine, this is one job where you don't want your pilot being distracted. He and the crewman sitting on the platform are in radio contact, of course; they simply do not fly if their radio should fail. Nor do they fly in winds above 30 knots. Interestingly, the turbulence rising out of some of the canyons is a factor that has to be considered when operating on lines in such places as Colorado and Arizona - and British Columbia.



Installation of conductor splice – Haverfield demonstration, August, 1990

The crew demonstrated how they inspect a line, and then they showed how they replace a spacer-damper, which took about a minute. They also removed several and demonstrated how they put in new ones at the correct spacing using a measuring wheel that rolls along the cable as the helicopter moves forward. A nice piece of flying.

Hanging a marker from the grounding cable that runs between the tops of the pylons was a two-stage process. The "hooks" were first clamped on the cable and then the perforated plastic ones were hung from them. I had the good fortune to be at the table with the pilot at noon, and we learned that working with the grounding cable requires much more "flying" from him than when they are working on the conductor cables, because the grounding cable is so light that it is in constant motion if there is any wind.

The final demonstration was a simulated splice. I learned that, when enough of the individual strands of a cable break so that a new piece of cable has to be spliced into the line, the technique is to clamp onto the cable on each side of the faulty section. A hydraulic jack is fastened, with appropriate cables, between the two clamps. The cable is then pulled together, which causes the section between the clamps to become slack. This can then be "sawn" out of the line and a new piece swaged in. We were told that this operation takes something under two hours.

As a Civil, I was as out-of-place at this demonstration as a haberdasher at a convention of nudists. My luck was holding, though, as I happened to fall in with Oliver Norris-Elye, P. Eng. and Norm Tarko who very kindly explained things to me as they developed. Oliver works with the Manitoba HVDC Research Centre while Norm is a Hydro man but working with Oliver. I am also grateful to Barry Rindall, P. Eng., for the invitation to cover this event and for providing the photographs. □

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EASIAP/90

By: J. Lucas, P. Eng.

On November 2, 1990, Premier Gary Filmon, P. Eng., and Industry Trade and Tourism Minister Jim Ernst addressed the introductory meeting of the Engineering and Applied Sciences Industrial Affiliates Program.

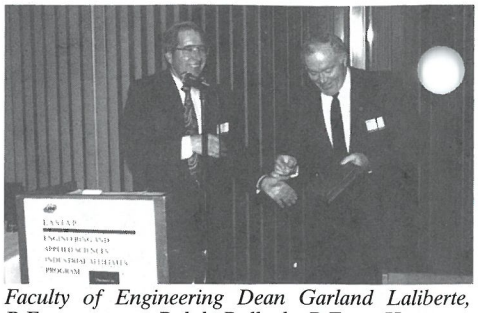
EASIAP is an initiative of the Faculties of Engineering and Agriculture, designed to provide a continuing point of contact between the university and the private sector.

Starting funds were provided by NSERC and Manitoba Industry Trade and Tourism, with continuing funds to come from participating firms.

For a $1000 contribution, a participating firm will have personal contact with a liaison professor, access to university libraries and information specific to its business, and will become a part of an EASIAP network.



Premier Gary Filmon, P.Eng. addresses official EASIAP opening.



Faculty of Engineering Dean Garland Laliberte, P.Eng. presents Ralph Bullock, P.Eng., Honorary Chairman of EASIAP, with Charter Membership Plaque for Bristol Aerospace Ltd.

The program will benefit both participating sectors. Participating firms will have improved access to the university's resources, while university researchers will have access to a wider scope of practical problems for research and laboratory use.

This improved transfer of information will expand employment and career opportunities for university graduates.

EASIAP charter members as of November 2, 1990 include:

Boeing of Canada Ltd.; Bristol Aerospace Ltd.; Canadian Aging and Rehabilitation Product Development Corporation; Canadian Bronze Company Ltd.; Federal Industries Industrial Group; Ford New Holland Canada Ltd./Versatile Farm Equipment Operations; Hughes Aircraft of Canada Ltd.; Manitoba Telephone System; Melet Plastics Inc; Midwest Detroit Diesel-Allison Ltd.; W.J.F. Sim and Associates Ltd.; Temro Division, [illegible] Canada Inc.; Triple E Canada Ltd.; and U[illegible]A Engineering Ltd. □

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WITH DEEP REGRET THE ASSOCIATION RECORDS THE PASSING OF:

W.H. Dickins
G.S. Lees

President's Message

Wm. McDonald, P. Eng.



Engineering Supply and Demand

Last September, the Canadian Council of Professional Engineers released a report of a study entitled "Engineering the Future". This study resulted from a joint effort of the Canadian Engineering Manpower Board and Employment and Immigration Canada. The study results are dramatically shown on the accompanying graph of the projected demand and supply. The graph indicates the potential for a serious shortfall of over 50,000 engineers by the year 2000.

The study further identifies a number of initiatives which, if acted upon, could alleviate the projected shortfall:

- retain more engineering graduates in engineering occupations;
- attract a larger proportion of students to engineering;
- attract a larger proportion of women to engineering;
- encourage more immigration;
- improve productivity through increased capital investment;
- attract qualified engineers currently working in other occupations.

The time horizon for the projected shortfall is almost around the corner and strategies will have to be developed and initiatives put in place quickly to be effective.

Historically, engineering enrollment has demonstrated a certain degree of elasticity (ie. when the economy is buoyant and construction and other related industries are booming, the demand for engineers increases, wages follow and more student enroll in engineering). However, it is projected that this supply/demand phenomenon will only cover a small percentage of the shortfall.

For some engineers, this supply problem will be positive, and will open up new opportunities and challenges. Of course, not all engineering disciplines will be affected in a uniform manner.

The President of CCPE, John R. McDougall, P.Eng., in a recent article on this subject, indicated that engineering enrollment is dropping, the number of women taking engineering has stalled at just over 10 percent, and immigration has been low for several years.

Where do we go from here?

Your Association will be severely taxed to develop and implement initiatives to meet the needs of the profession as it moves toward the big 2000.

We will have to continue with the work that we have started in upgrading the image of the profession and by making ours a profession that younger people will wish to pursue. We must continue to tell "our story" to the public, and be front and centre on public issues.

The success of our initiatives in attracting women into our profession is trailing far behind Law and Medicine, where enrollments often exceed 50%.

Allison Baignee P.Eng., of the Canadian Engineering Manpower Board, in a recent article entitled "Women in Engineering – Then and Now" concluded as follows: "Engineers are misunderstood, have no prestige, and are paid much less than many other professionals. Given all this, why does anyone, male or female, choose engineering? This is not a female problem; it is an engineering problem."

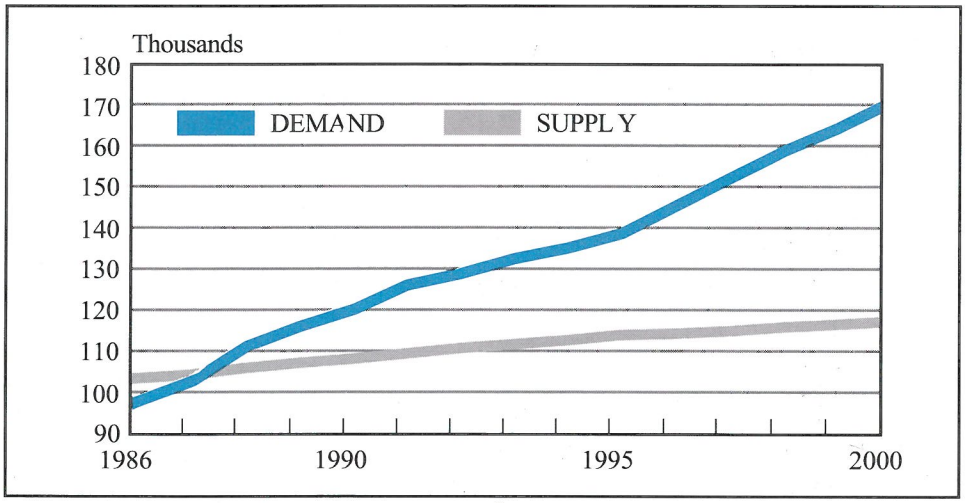
The Federal government recently announced an expanded immigration program. However, the route for immigrant engineers into the profession is in many cases a long, slow process. In Manitoba, as in other provinces, the procedure involves an assessment of academic credentials, usually followed by a requirement for further examinations to meet academic qualifications, then, following academic qualification, an assessment of the candidate's work experience.

While we have a responsibility to ensure that only qualified engineers are entitled to practise in this Province, we must also guard against any perception of being overly cautious or discriminatory in utilizing the resource of the immigrant engineer.

In conclusion, it will be a "tall order" for the various associations across the country to change current trends and meet the nation's future needs.

What are your thoughts? I'd like to hear from you. □

Projected Demand and Supply of Engineers in Canada



Letter to the Editor

Responding to a comment by Peter Steadman in your October issue, I am grateful to him for correcting my statement in August that St. Andrew's Lock and Dam "is the only lock west of Sault Ste Marie". Obviously, locks at the Arrow Lakes dam in B.C. share this distinction.

I regret having accepted too readily statements of others and a prevalent misconception. Nevertheless, exchanges such as this add value to publicizing engineering heritage by bringing to light facts that may be little known, even among interested engineers.

Yours sincerely,

W. Gordon Plewes, P. Eng., Chairman
CSCE History Committee,
Pairie Region

Fax to the Editor

I enjoyed the December issue. News and policy articles are the highlights to me.

In "Mindbender #1", the author has falsely assumed that traction is not a factor. Anyone this fast will have a tire temperature/slippage problem. Acceleration vs. time will not be linear.

In "Mindbender #2", the author has neglected to account for the surface tension between the soup and the air. This will require that the top surface of the soup be 1 - 2 mm above the lowest point of the rim of the bowl, before any liquid will spill. Thus the answer, for warm soup, is arc sin 2.07/5=24.46 degrees. For very watery soup, near its boiling point, the answer would be 24 degrees. The answer would have been more exact if the fluid were a common liquid with a narrow range of surface tension, such as water, cold milk, or apple juice.

Puzzle: A fly is frozen in fear on the end wall of a 20'x 20'x 50' room. He is 1' from the middle of the baseboard. A hungry spider (with unusually good vision) is 1' below the middle of the top edge of the opposite wall. How long is the shortest path the spider can take, if he has any interest in making the fly's agonizing wait as short as possible.

Credit and the answer lie in Scientific American Magazine, from 32.5 years ago.

I DO enjoy puzzles.

D.H. Grant, P. Eng.

"APEM's New President – A Quintessential Engineer"

By: W.B. Mackenzie, P.Eng.

Our new President, Bill McDonald, brings with him a background in engineering, in community work and in Association affairs that makes him eminently qualified for the position. He has a good grasp of the serious issues facing the engineering profession today and is very much aware of the important role the Association has played and must continue to play in addressing these issues.

Initiatives put in place by his predecessors will be expeditiously carried forward. He will work closely with Council and staff to put in place any necessary initiatives to address current concerns of both the public and the membership.

Although his business career has carried him into Ontario, Saskatchewan, Alberta and B.C., Bill remains a Manitoban at heart. Born and raised in Flin Flon (an auspicious beginning for anyone), he was educated in Flin Flon, Seven Sisters Falls and Winnipeg. He graduated from the University of Manitoba (also auspicious) with a Civil Engineering degree in 1966. Subsequently he attended the Banff School of Advanced Management.

Much of his working career has been in the heavy engineering/construction industry and particularly in the structural steel business with Dominion Bridge. He has been involved in the construction of a number of major projects in western Canada including, in Manitoba, the Inco plant at Thompson, in Saskatchewan, the South Saskatchewan Dam and the Saskatchewan Power Corporation thermal generating plant at Estevan, in B.C., the Mica Dam and Kootenay Canal Dams, in the Yukon, the Aishihik Power Plant, and numerous bridges and industrial facilities.

For the last ten years Bill has been a dedicated member of the Energy and Mines Department of the Manitoba Government. He is currently the Director of Energy Management.

Bill joined the Association in 1968 and it is of interest to note that the three professional engineers who provided references for him said that he had "excellent character and reputation" - an important, although not a legal, prerequisite for registration as a professional engineer. Since becoming a member of the Association, Bill has been involved in a number of important committees and has served on Council.

His community involvement has included dedicated service to the Richmond Kings Community Club and the Victoria Beach Community Club, and active participation in Church affairs. Currently, he is on the Board of Rossbrook House, a youth centre in North Winnipeg.

Some questions and Bill McDonald's answers will provide the membership with an insight into the viewpoints of the person who will lead the Association through 1991.

Q. Engineering is in an age of transition. Enrollment in engineering schools is declining and the demand for engineers is rising. What role can APEM play in addressing this problem?

A. We must do whatever we can to improve the image of the profession in the eyes of the public. Individual members must play a leadership role in this process. We must put in place programs to encourage more women to enter the profession of engineering. And we must examine ways of speeding up registration of bonafide engineers who have come to Manitoba from other countries.

Q. What do you see as the primary role of the Association?

A. The primary role of the Association is to govern and regulate the practice of engineering in the Province as mandated in the Engineering Profession Act.

Q. Do you see coming up in your term as President any new initiatives to enable the Association to carry out its mandate more effectively?

A. The engineering profession has much to offer the public. We must work towards encouraging the members to take their place through participation and contribution and being heard on pertinent issues that affect the public and that affect our environment. We must continue to work with school children in an attempt to convince them that engineering is a useful and rewarding profession.

Q. Should the Association become more involved in providing additional services to its members?

A. In my opinion, we should be doing a better job of most of the traditional roles we have been involved in such as Act Enforcement, image-improvement and explaining to the public who we are and what we do. I think we should be redirecting our present resources towards these current initiatives before implementing new initiatives.

Q. What is the most important issue facing the profession today?

A. I think the most important issues and ones in which we must direct our efforts towards the improvement of the image of engineers, the enforcement of the requirements of the Act so that unqualified individuals will not be offering engineering services to the public and the declining enrollment in engineering schools. These are all serious issues.



Wm. M.A. McDonald, P.Eng.

Q. Do you feel that minimum standards for entry into the profession should be raised and, if so, how will APEM accomplish this?

A. I feel that this matter requires more study. Obviously if we are going to upgrade our minimum standards it must be done at more or less the same time in other provincial Associations across the country. Otherwise the mobility of engineers from province to province would be severely impeded. Also, we must give serious consideration to the quality of on-the-job development and training that our young "Engineers-in-Training" are receiving in the workplace.

Bill McDonald has a strong Council backing him this year and this policy-making and decision-making body should provide good leadership for our profession in the Province of Manitoba. □

Boeing Canada Technology Ltd. Wins Canada Export Award

On October 1, the Winnipeg Division of Boeing of Canada Technology Ltd. was presented with a 1990 Canada Export Award for excellence in exporting by Minister for International Trade, John C. Crosbie.

The Awards, sponsored by External Affairs and International Trade Canada, are presented annually to Canadian companies that have displayed exceptional performance in international exporting.

The Winnipeg Division has more than 1,500 employees, and has been exporting its fibre-reinforced composite components for aircraft and aerospace applications, principally to the United States, since 1971, its first year of operation. Export sales were up 30 per cent in 1989.

President Jim Sayer stated that he was extremely pleased that the Division had won the Award. "It is concrete recognition of the dedication and hard work of our Winnipeg personnel. We're in a very prestigious winner's circle," he said.

Boeing was among eight winners from across Canada recognized by the Department during October which is Canada's International T Month.

As one of Manitoba's largest industrial employers of engineers (it employs 50 engineers), Boeing is to be congratulated for receiving this award, which signifies excellence in technology and manufacturing. □

Pat Feschuk, P. Eng. - Your Vice-President

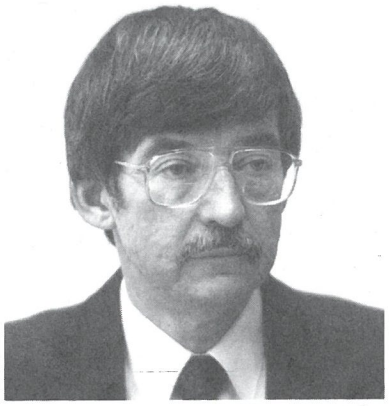
V.L. Dutton, P. Eng.

Being a country-type myself, it was a pleasure to interview a 100% Manitoban who was raised in the villages of Elie, Clanwilliam, Angusville, and Sundown. Pat told me his father had worked for the railway so, as soon as I heard Angusville, I knew it had been the CNR.

Pat had been a student of mine many years ago and I remember him as a quiet, hard-working, and competent student. His curriculum vitae shows that he has not changed his habits. I will not list all of his many professional activities, but his work with the Continuing Education Committee of E.I.C. and his many years as Secretary-Treasurer for Camp #8 of the Ritual of the Calling of an Engineer are representative of Pat's dedication to his profession.

Pat has two sons, Grant (19 1/2) and David (18). Grant is pursuing Science at St. Boniface College, while David is finishing Grade 12 at College Beliveau. Both boys are fluently bilingual, of course.

Being a poodle-person myself, I was delighted to learn that the Feschuks have two standard poodles (those are the big ones). In addition to their dogs,



N.P. (Pat) Feschuk, P.Eng., Vice-President

Pat enjoys their family cottage at Grand Beach, son David's cello playing, and some aerobics and walking activities.

In growing to know Pat during this interview, I would say that our Association has made an excellent choice in its new Vice-President. □

The 3 R's But No S or T

By: J. Lucas, P. Eng.

Graham Orpwood, New York University Science Education Director, has been deeply involved in evaluating the level of science education in Canada's school systems. Sadly, he has labelled our levels as "distinctly poor" on a world standard.

In the early 1980's, Mr. Orpwood was director of the Science Council of Canada's study of science education in elementary and secondary schools. He put forward recommendations for federal participation and support for science and mathematics education across the country.

To date, federal response and support has been non-existent.

The function of every industrialized nation depends on its ability to develop and use science and technology.

Mr. Orpwood believes that it is time we finally did something about our unique neglect of science education in this country. □

"President's Term – Twelve Meetings, One Year"

W.G. McKay, P. Eng.

During his term as President, Ken Buhr periodically reminded Shirley Matile and the writer that he had not yet been interviewed by the Manitoba Professional Engineer. In spite of his gentle urging, it did not come to pass until his term had been completed. Finally, however, we held a "post-mortem" breakfast interview, in which Ken reflected on the accomplishments of the Association under his leadership.

In his platform for election, Ken had referred to "the protection of the public", which he felt could be ensured by strengthening professional development and through the role of the Act Administration Officer.

Professional Development

Ken feels that the Professional Development Committee has played an important role in assisting members with their professional development. He found particularly educational the session on the Burnaby Shopping Centre failure and the seminar on Professionalism. In general, he appreciates the facility which the breakfast meetings provide to bring engineers together to allow them to share ideas and problems.

Act Enforcement

Ken considers the policing of the yellow pages to ascertain the qualifications of those who advertise themselves as consultants to be one step toward the protection of the public. Contact is made with the small, and in some instances the large, employers who are advertising for engineering staff, to ascertain that they recognize and properly utilize the engineer in their own organizations.

Ken served as chairman of the selection committee which hired the Association's first Act Administration Officer.

Wish List - Group Practice

All Presidents have wish lists, and one of Ken's major desires was to accomplish the implementation of group practice. This is a commitment which many past-presidents have sought to accomplish. Unfortunately, it was not Ken's achievement, either, and it became a disappointment to him.

Technologists

Another disappointment to Ken was the status of APEM's relationship with the Technologists – a problem shared by many other Associations. Ken had hoped that, during his term of office, the relationship would advance to a stage which would have strengthened and resolved the position of the two organizations. It did not.



K.A. Buhr, P.Eng., Past-President

Practice of Engineering

Another goal of Ken's was a definition of the Practice of Engineering. This goal was almost achieved. On the National level, through CCPE, Ken felt that it was close to receiving general approval, but it was disappointing for him to realize that Provincial parochialism had, in some instances, hindered overall approval.

Response to National Concerns

Again through CCPE, Ken feels that there should be a national institution of engineers with expert knowledge established to collectively respond to national emergencies, to strengthen the image of engineers. For example, the publicity that could have been generated by the provision of expert opinions of engineers to the Heagerfield tire fire would certainly have strengthened the public image of engineering, nationally.

Code of Ethics

Ken is pleased with the progress made toward the revision of the Association's Code of Ethics. Not only has our own committee completed a complete review of the Code, but a National model Code of Ethics has been achieved, also. All that remains now is for Council to finalize its own Code, with this model as a guide.

Student Enrollment

The increase in student enrollment in engineering was an encouragement to Ken. However, the problem of the EIT who enters a business in which he is the sole engineer remains: how does he gain the experience necessary to qualify for registration when he is not working under the supervision of Professional Engineers? The mentor program appeared to be a solution, but it has been set back by the legal opinion that there would be implied

Continued on page 11

Thoughts about Liability and Insurance

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

Discussion relating to Professional Liability Insurance is certain to draw out both firmly held opinion and normally suppressed fears. Many in the consulting community would suggest that this form of insurance is as fundamental a need as a functioning computer. Those of us who live in corporate, governmental or academic environments are somewhat more removed from the day-to-day realities of the premium question. This doesn't change the basic realities of the litigious society in which we "ply our trade"; it only changes the amount of time we spend thinking about them.

I cannot claim to have any particular expertise as it relates to the specifics of Professional Liability Insurance. However, in preparing lecture material for a second year class which I teach, I found myself faced with the problem of defining what constitutes a professional working environment. Obviously, professional responsibility emerged as one of the elements of that environment. Professional liability followed close behind.

When you prepare information for students, you are forced, as the old adage goes, to begin at the beginning. In this case the "beginning" reduces to searching dictionaries for definitions. Key to the discussion at hand is the word liability. Among many definitions, the one that stands out in my mind is "something disadvantageous". When you consider the root word, liable, you find definitions like "subject, exposed, or open to something possible or likely, especially something undesirable" or "under legal obligation; responsible or answerable". Further, answerable can be defined as "liable to be asked to give account: responsible, as to a person, for an act, etc." and responsible is said to mean "answerable or accountable, as for something within one's power, control or management". No wonder professionals seek out insurance!

There seem to be two very different concepts buried within the definitions listed above. The most obvious of these is contained in the negative implications of words like "disadvantageous" and "undesirable". These are threatening words. One could easily conclude that the corollary to liability is self-preservation. If that is the case, it follows that liability insurance represented protection from unjust persecution.

Taking a more positive view of the definitions, the words "answerable" and "responsible" are more familiar. These terms show up in our Code of Ethics, our Act and other basic writings relating to the profession. In general, we consider it our professional duty to provide services which protect the public interest. We profess to be qualified to pass technical judgement on matters relating to our individual areas of expertise. We accept professional responsibility and believe ourselves to be answerable for the effects of these decisions. These concepts are less threatening because they relate to the profession and our contributions within the profession. Viewed from this perspective, liability insurance becomes protection against the occurrence of honest error.

The truth probably exists between these extremes. The uncertainty results from dependence on the legal system for both definition and protection. By definition, professionals are responsible for their works. When someone decides, for whatever reason, that those works have caused "harm" to that individual, claims will be filed. These claims normally involve large sums of money. Few people are able to react to these demands without financial support. This support is, in most cases, liability insurance. A safety net against the negative implications of accepting responsibility.

There is no doubt that professional liability insurance is a necessary part of a consulting engineer's "tool kit". Should engineers who are employed by corporations, by government or by academia have this same personal safety net? What sort of protection is available? Is it an individual responsibility or a collective one? These questions go well beyond my ability to respond. Hopefully, those more qualified will address these, and other, specifics in future issues.

Editorial Note: Mr. Britton's article is a good introduction to professional liability. Perhaps some of the readers may wish to write about the "deep pockets", "peer review" and "going it cold" aspects of liability. □

Financial Reserves

By: G.E. Laliberte, P. Eng.

At its June 1990 meeting, Council approved a policy requiring it to target, in its budgeting process, a financial reserve equal to 1.20 times its projected annual expenditure. The term "target" or, more precisely, "targeted amount", as it is used in the policy, was used deliberately. It is intended to reflect Council's intention to permit short-term departures from the 1.20 figure provided that such short-term departure is implemented in the context of a longer-term budget and program plan which would result in a return to the targeted amount. Thus, the targeted amount is a guideline which must be accompanied by a judgement which takes the longer term into account. The rationale of setting the financial reserve at this level relies on a number of factors.

Our Association does not own any real property. A number of other constituent members of the CCPE own such property. These organizations generally do not have large reserves; however, their financial security is provided by real property, the value of which for some far exceeds the level of the financial reserve set by our Association.

Council considered that a financial reserve is necessary as a hedge against potentially high legal costs. These costs could result from legal defence requirements if a member of Council and/or staff were named in a third-party lawsuit. They might also occur if an expensive disciplinary hearing was required and/or if several less expensive disciplinary hearings coincided in a particular budget year.

In setting the level of the financial reserve, Council also considered that a financial reserve is necessary to facilitate a winding up of the Association in the admittedly unlikely event that it were required to do so. The Association has contractual responsibility for its staff and, with that responsibility, goes financial responsibility for fair severance settlements.

In reaching a decision to approve the financial reserve policy, Council noted that, without the investment revenue generated by the funds in the reserve, annual membership fees for practising engineers would have to increase by about thirty dollars to compensate for the foregone revenue. □

– Notice –

Important Reminder Annual Fees

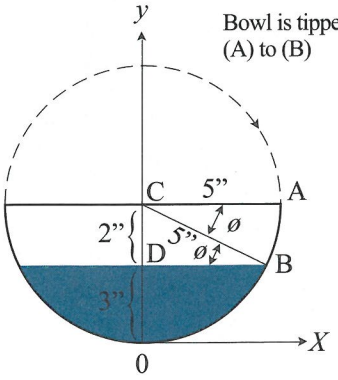
Fee invoices have been mailed to all members. Members are again reminded that receipt of fees in the Association office after February 28th, 1991 will incur a late payment administration fee of $45.00. If fees are mailed prior to February 28th, and received after February 28th, the late payment fee will apply.

Also, be reminded that if all fees owing are not received in the Association office before July 1st, 1991, the member's name will be removed from the register and that person is then prohibited, by law, from practising engineering in Manitoba.

Solution to "Mindbender #2"

(December issue)

Define and label co-ordinates:

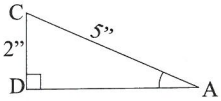


Because the bowl has a global shape, as it is tipped the depth of the soup remains constant at 3 inches.

The soup will begin to spill out when the top edge of the bowl (A) is tipped to (B). This occurs through ∠ ACB.

Therefore: m∠ø = m∠ACB = m ∠CBD
(reason: // lines)

Solving for m ∠CBD:



$\sin(\angle CBD) = 2/5 = 0.40$
$m\angle CBD = \text{arc sin } 0.40$
$m\angle CBD = 23.6°$

Therefore: $m\angle ø = 23.6°$

Gerald J. Maier, P. Eng. CPE Gold Medal Award Winner

By: J. Lucas, P. Eng.

The Canadian Council of Professional Engineers has awarded the 1990 Canadian Engineer's Gold Medal to Mr. Gerald J. Maier, P. Eng., Chief Executive Officer of Trans Canada Pipelines Limited.

Mr. Maier attended Notre Dame College (Wilcox), the University of Manitoba, and the University of Alberta. He received a B.Sc. in Petroleum Engineering from the latter institution in 1951. He also graduated from the University of Western Ontario's Management Training Course.

His career has involved many business, professional and technical organizations.

After graduation, Mr. Maier worked with Hudson's Bay Oil and Gas Company, Continental Oil Company and other affiliates until 1981, when he resigned as Chief Executive Officer, but remained as Director and Chairman of the Board until March, 1982.

Until November, 1985, Mr. Maier served as Director, President and Chief Executive Officer of Bow Valley Industries Ltd., and a Director of Bow Valley Resource Services Ltd. At that time, he assumed the office of President and CEO of Trans Canada Pipelines Ltd. and Trans Quebec & Maritimes Pipelines Inc. He is presently Chairman of the Board and Director of Encor Inc. and Western Gas Marketing Ltd.

Mr. Maier's professional associations include: Oilfield Technical Society; Engineering Institute of Canada; Canadian Institute of Mining & Metallurgy; and the Association of Professional Engineers, Geologists and Geophysicists of Alberta (Past-President).

Mr. Maier is also a member of the Board of Governors of the Canadian Petroleum Association, Vice Chairman of the Canadian National Committee of World Petroleum Congresses, the Business Council on National Issues, and the International Trade Advisory Committee. He has also served as a member of the Sulphur Institute and a Director of the Independent Petroleum Association of Canada.

In addition, Mr. Maier's community and charitable work history is equally exhaustive.

He has served as President of the Calgary Booster Club; Vice Chairman of the Alberta Heart Foundation; Chairman of the Major Accounts Division, Toronto United Way Campaign; Director of the Calgary YMCA, the Vocational and Rehabilitation Research Institute, the 1983 Canadian Summer Games in Calgary, the Calgary Philharmonic Society, and the Calgary Institute for the Administration of Justice; Honorary Chairman of the Calgary Crime Stoppers; a member of: the Industry Faculty Advisory Council for the Diocese of Calgary, the Board of Patrons of the Alberta Engineering Centennial Committee, the Board of Trustees of the Manning Awards, and the Board of

Continued on page 12

Another U.S. Space Shuttle Disaster is Likely

– *Reprinted with permission from August, 1990 issue of The PEGG, the Publication of Alberta's Association.*

Another U.S. space shuttle disaster is likely, warns a former technical trouble-shooter for Morton Thiokol who opposed the ill-fated Challenger launch four and a half years ago.

The redesigned joint on the shuttle's solid rocket boosters is a worse design than the joint it replaced, says Roger Boisjoly, P.E., who has 27 years of experience in the aerospace industry in the primary disciplines of mechanical design and structural analysis.

Speaking at a May 16 dinner meeting in Edmonton organized by the Institute of Electrical and Electronics Engineers (IEEE), Mr. Boisjoly stated, "this is a joint I fully expect to fail at any given time and without warning. This is a Murphy's Law type of joint."

Mr. Boisjoly told the 400 people in attendance how he vigorously opposed the launch of the Space Shuttle Challenger but management over-ruled the original decision not to launch. The shuttle was launched on January 28, 1986 and destroyed as a result of joint seal failure. Mr. Boisjoly testified against his Utah-based employer in a Presidential Commission investigating the shuttle explosion that killed six astronauts and a teacher.

Although his testimony and submission of documents before the Presidential Commission was vital to exposing the truth about technical and management problems prior to and subsequent to the disaster, for his efforts as a whistle blower, Mr. Boisjoly has paid a significant price to his career. After months of pressure from the company, he left Morton Thiokol in September, 1986. Since that time, Mr. Boisjoly has made extensive and numerous testimonies to investigators and provided interviews to newspapers, magazines, television and radio. With the support of the IEEE, Mr. Boisjoly has also spoken at numerous forums across the country.

The two solid-fuel rocket boosters (measuring 45.4 metres high and 3.7 metres in diameter) which help lift the shuttle into space are comprised of a stack of cylindrical segments, four of which hold solid propellant and constitute the motor itself. The four motor segments are loaded with propellant at the Morton-Thiokol plant near Brigham City, Utah, and are shipped by rail to the Kennedy Space Center in Florida, where they are joined together by field joints.

"The field joint is the joint that actually failed," explained Mr. Boisjoly.

Two quarter-inch diameter, synthetic rubber seal rings - called O-rings - seal each joint between the booster's segments. The Challenger was destroyed after hot propellant gases blew past the aft joint of the launch vehicle's right booster, burnt through the two O-rings and vaporized the seal.

As early as April, 1985, NASA and Morton Thiokol knew temperatures below 10 degrees Celsius were "troublesome" to the O-rings, said Mr. Boisjoly.

A launch on April 29, 1985 was saved from a "Challenger-like disaster" by a secondary seal after the primary O-ring failed, he said.

In a July, 1985 memo, Mr. Boisjoly said he asked management to officially endorse a task force told to solve the O-ring erosion problems. He warned that the consequences of not dealing with the seal problems "would be a catastrophe of the highest order - loss of human life".

The launch of the Challenger in freezing temperatures led to the disaster, said the aerospace engineer.

The night before the Challenger launch, officials from Morton Thiokol and NASA discussed the O-ring problem. Boisjoly and a colleague provided data on a conference call to NASA proving that the O-rings would harden and shrink in low temperatures which would reduce their ability to seal off hot gas inside the rocket. The two engineers also showed that the secondary seal would likely lift out of position during launch.

Despite the engineers' last-minute efforts to postpone the launch, later that evening four Morton Thiokol vice-presidents voted unanimously to go ahead and sent a memo to NASA in favour of a launch.

"We were not polled," said Mr. Boisjoly. "NASA accepted the decision to launch."

He then displayed "the chart that was used to send the Challenger to its disaster" on an overhead projector.

"I had made up my mind not to watch the launch," he said. "I was scared to death."

As colleagues gathered to watch the launch the next morning, a fellow engineer urged him in to watch. He reluctantly agreed. Moments later he watched in horror as the explosion occurred on the television screen.

"If only they had listened, it would not have happened," he told himself.

In the months following the ill-fated launch, NASA "was diligently trying to find a reason other than cold temperature" to explain the disaster, said Mr. Boisjoly. "I was the naive engineer who told them how the joints worked."

Although at first he was allowed to provide technical input, the engineer was isolated from the redesign efforts. After suffering months of pressure from management, including various "tactics", Mr. Boisjoly left his employment at Morton Thiokol.

"Protect your documentation," he advised the professionals in attendance.

"Speaking out will grant you a clear conscience," he said, in addressing the ethical decisions that he had made in blowing the whistle on his employer.

Council Reports

November 19, 1990 *By: W.G. McKay, P. Eng.*

AT WHICH COUNCIL PONDERS THE FUTURE OF THE JAMES AVENUE PUMPING STATION.

The first meeting chaired by new President Bill McDonald (Energy & Mines, Province of Manitoba) was underway on November 19, 1990, at 1:00 p.m. New Councillors were Carl Anderson (UMA), Vish Gupta (MTS) and Pat Feschuk (City), while Ray Hoemsen, Milt Goble, Walter Harrison and Walter Pawlikewich returned for a second term. Jack McDougall and Barbara Cape continue as appointed councillors.

Arising from a previous meeting in the matter of a member who was fined in a disciplinary action, it was noted that a partial payment of the fine had been received, with an indication that further payments would follow as he was now employed.

Executive Director Dave Ennis explained the workings of the financial statements, noting that, by the accounting practice of the Association as a non-profit organization, funds must be "retained for continuation of operation"; hence a short-term T-Bill investment program. Of interest, the sports committee is the only committee required to operate on a cost-recovery basis. Speculation - could there be a similar setup for other committees?

Transfers, licences, registrations, etc., proceeded without delay - an indication of good preparation by staff.

Councillors are to elect from within their members a Vice-President who, by the new By-Laws (likely to be passed by mail ballot), will become the President in due course. After some discussion of the knowledge of one another and the evaluation of the time requirements of the office, it was resolved to lay over the election of the Vice-President until the December meeting.

Election of the "Executive Member" - the person from Council who, along with the President, the Vice-President and the Past-President makes up the Executive Committee – was likewise laid over.

The members of the Board of Examiners were re-appointed for another year, with Fred Kaita (MTS) re-appointed as Chairman.

Pat Feschuk and Vish Gupta were appointed as Council members to the Nomination Committee.

These appointments allow Councillors, appointed or elected, to sit on various committees in a liaison function of communication between Council and committee; such Councillors having no vote on the committee. Some Councillors remained with their former committees, others changed, and new ones made their choices.

In the December issue of the Manitoba Professional Engineer there is a report of a disciplinary action against a member who pleaded guilty to negligence. By his recognition of guilt, the action was limited to a reprimand and a recording within his file of the actions taken. The complainants were advised of the action arising against this member. Concern over the non-disclosure of the member's name and the confidentiality of the file, should there be an inquiry either from within or without the profession, caused the Councillors to ponder as to the extent of "protection of the public". Mr. Ennis advised that the Practice and Ethics committee is bringing forth recommendations for changes to By-Law 45 (discipline). Council expressed its concern by resolving to call for a interim report to be presented at the February meeting on these recommendations.

In the absence of any sign of winter, the sports committee has again decided to try for a skiing event in the U.S. Last year, they approached Council for a small grant to cover advertising for the event. Such requests are not required for golf and curling, as these "sports" are in the committee's terms of reference. Last year the interest was too little to support the project. Council gave the approval to try again this year.

Messrs. George Lawlor, Bill Newton, Dan Prowse, and from the Council Ray Hoemsen, representing the James Avenue Engineering Works Task Force, outlined the details of the James Avenue Pumping Station project. With a grant of $35,000 from the Winnipeg Core Area Initiative, a detailed report was prepared by architects Stechesen Katz. This report outlined a phased program, beginning with an initial phase of $415,000, up to an ultimate program which could involve a major addition to the station - possibly housing APEM facilities – at an expenditure of $6,000,000. APEM participation would be as a member in a non-profit organization charged with the development, operation and maintenance, etc.

The James Avenue Pumping Station was undoubtedly one of few such pumping stations on the continent at the time of its construction, and is an excellent industrial heritage facility. The committee was questioned on aspects such as the role of APEM in ownership, in operation and maintenance, which could initially operate as a museum and later, with much more development, a centre for Science and Technology for Manitoba.

Overriding all of these questions is the matter of the initial phase and the urgency of a decision to proceed, since funding is related to the imminent end of the Winnipeg Core Area Initiative program. Council resolved to visit the station on November 21, 1990, and then to further debate the project at a special meeting.

On this note Council adjourned at 4:30 p.m., having completed an active and well-orchestrated meeting by the new President. □

November 19, 1990 *By: W.B. Mackenzie, P. Eng.*

AT WHICH COUNCIL VISITS THE JAMES AVENUE PUMPING STATION.

A special meeting of Council (a rare occurrence) was held on November 21st to consider the question of APEM involvement in the (hoped for) conversion of The James Avenue Pumping Station into an engineering museum.

Members of Council toured the existing facility first and they heard a presentation by George Lawlor, a member of the Public Relations Committee. George has put a tremendous amount of time and effort into this project. The question, and the problem, in the whole matter is, as one might guess, money. Council had previously decided that APEM would not be involved in financing the costs of conversion of the subsequent staffing and maintenance.

After lenghty discussion, and based on the assumption that only private-sector funding would keep the project on the rails, Council decided to "champion" the formation of a non-profit corporation to carry the whole concept forward, including a search for funds.

Council agreed to expend up to $2,000 of Association funds for the purpose of putting the non-profit corporation in place. Council also decided that an APEM member should be a member of the Board of Directors of the new Corporation.

Presumably, APEM's direct involvement in the project is now finished, and the torch has been passed to others to see the project through to a successful conclusion.

December 10, 1990 *By: A.E. Ball, P. Eng.*

AT WHICH COUNCIL MOVES FORWARD ON ENFORCEMENT AND THE ENGINEERING MUSEUM.

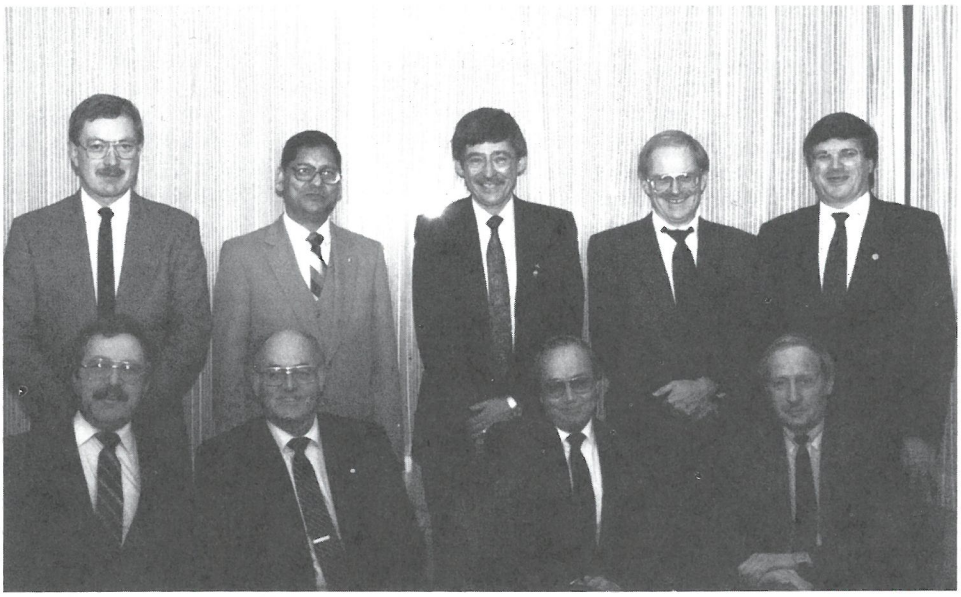
Council covered the usual approvals of past minutes, the financial statement, licences, engineering graduates, transfers, registrations, etc. before moving on to the election of a vice-president and executive member. Four councillors were nominated by secret ballot for the position of vice-president, but three graciously declined, leaving a unanimous vote for Mr. Pat Feschuk. Some councillors declined the nomination due to time constraints, but sentiment was also expressed that Mr. Feschuk could bring the most experience to this position. The election of the executive member was similarly undertaken, with two of the three nominees declining. Mr. Carl Anderson, not wanting to decline two nominations in a row, was appointed.

Congratulations to these two gentlemen.

Next came the most discussed and debated topic of the day. A proposal was tabled by the APEM administration to notify, in writing, the employers of members who have been struck from the register for non-payment of annual dues. In an effort to live up to its mandate of act enforcement, APEM wishes to protect the public by advising employers that their "professional engineers" are no longer licensed to practise in Manitoba and that, in fact, it is illegal to undertake engineering functions without a licensed engineer. Major objections at the table were that the approach was too soft and that the members' names should instead be published in the public newspaper. The letter's wording was discussed in some detail, but finally the proposal was accepted as submitted. Late payers beware: being "written off" will now have a new

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Association of Professional Engineers of Manitoba 1990 - 1991 Council



Top Row (l to r): Ray Hoemsen; Vish Gupta; Vice-President Pat Feschuk; and Past-President Ken Buhr. Bottom Row (l to r): Milt Goble; Lay Councillor Jack McDougall; Executive Member Carl Anderson; and President Bill McDonald. Missing: Walter Harrison; and Lay Councillor Barbara Cape.



Councillors Pawlikewich, Anderson, Goble and Feschuk take a break during December Council meeting.



Dave Ennis, Bill McDonald and Joan McKinley hard at work during Council meeting.

John Vardon Memorial Scholarship

This is a scholarship program for studies in Transportation Engineering. An award of $1,250 is available to assist in the payment of tuition, fees, books and supplies for the 1991-92 academic year.

Eligibility

1. Candidates shall submit evidence of acceptance, or probable acceptance, for study in a program in Transportation Engineering.
2. Candidates must be registered as full time students in a Transportation program at a Canadian University.
3. Candidates must be Canadian citizens.

For application forms please write to:

D.M. Henderson, P. Eng.
Engineering Department
453 West, 12th Avenue
Vancouver, B.C. V5Y 1V4
(604) 873-7393

Completed applications must be received by April 2, 1991. □

Thesis Day

March 15, 1991
Electrical and Computer Engineering
University of Manitoba
Anyone interested in reading theses is invited to call Tammy at 474-9603. □

Council Meetings

Continued from page 8

meaning. (Members who want to resign or assume non-practising status may do so by notifying the APEM office).

Other business:

1. Council appointed councillors Walter Pawlikewich and Ray Hoemsen to the 1991 Awards Committee. Past presidents, starting with Ken Buhr, will be approached until two agree to serve on the committee. Council also agreed to approach past recipients and committee members to serve this year.
2. As is customary for the first meeting of the year, Council considered and approved the appointment of various committees and chairs as presented.

The James Avenue Pumping Station was also discussed in some detail, with Council accepting the name "The Engineering and Science Foundation of Manitoba." One councillor reckoned that using the word "Foundation" would make fund raising and grant acquisition much easier. Council also approved a list of prominent engineers to approach to serve on the Foundation's board of directors.

Following the afternoon break, the traditional glass of wine was served (traditional at Christmas, that is – indulgence such as this is certainly not the norm!) By this time, only one item of business was left, where Council accepted the resignation of Dr. Ian Goulter from the Board of Examiners and appointed Dr. Al Clayton to fill the vacancy.

The meeting adjourned at 3:10, before most Councillors could take advantage of the decision-making influence of the wine. □

A Can of Worms

By: William van Leeuwen, CD, CET

Just as humans are vulnerable to biological diseases, so are computers vulnerable to software diseases.

Worms make me squeamish and viruses more so. Now they are even attacking my computer.

A survey of some of my OACETT colleagues revealed that many of them are also owners or users of computers, but with limited knowledge about computer diseases and how to cure them. Just as humans are vulnerable to biological diseases, so are computers vulnerable to exotic software diseases. To counter this increasing threat, we should become aware of remedial practices to recognize the problem and effect a solution.

Whereas a child gets the "sniffles," which we recognize by a runny nose, the computer will signal its discomfort by displaying a message such as "FILE NOT FOUND" or, in the more extreme case, simply, "ABORT".

Before we explore the solution, we should define the problem. In doing so, we need to define a few terms. Let us define the main diseases by their characteristics.

A **worm** is a program that has the ability to propagate across a network of computers. A worm does not require the execution of the host program in order to function. A worm is a self-contained, self-replicating program which can cause benign or malicious software damage.

A **virus** is an unauthorized program that can infect other programs by modifying them to include a possibly evolved version of itself. There is an important distinction between a worm and a virus. A worm spreads by copying itself from system to system, but it does not necessarily alter the system. A virus, on the other hand, spreads by attaching itself to another program so that when you run that program, the virus will attach itself to still more programs that it can reach. Over time, a virus can infect all the programs on your disk system.

A **bacteria** is a special software program that propagates by electronic mail; thus, it is very device-specific. It attaches itself to all addresses of the victim's mailing list.

Logic Bombs are a special type of virus. A time-bomb virus is one which will set itself off at a precise time, whereas a fire-cracker virus will go off, without gain or purpose, when a certain internal condition has been reached.

Hackers are accused of initiating the problem, but this is generally unfair. Hackers are defined as people interested in or knowledgeable about both computer hardware and software, to the exclusion of almost everything else. However, hackers who penetrate remote systems without authorization are more aptly called "crackers." Crackers write code to cause innocent pranks, like drawing Christmas trees to your screen, to malicious deeds, like wiping out all your saved files.

Consider the following recent notorious events:

The **Friday 13th Virus** originated in Eastern Europe, and had the ability to destroy data files stored in personal computers. The intent was definitely malicious.

The **Burleson Virus** was a directed virus, developed by a disgruntled employee, and costing the company over $200,000 in lost business due to destroyed records. This is an example of an international crime.

Current literature is full of computer misdeeds which, until very recently, have never been prosecuted. Some are clever and amusing, but most are not.

Infected systems usually display some recognizable symptoms, such as:

- The computer seems to take a lot longer to react than normally. This could be caused by executing internal code which has been replicated. It eats time, and time is money.
- The disk unit indicator lamp lights up unexpectedly - indicating an unauthorized entry into this device. It might be a worm.
- Less memory is available for your use than you can account for. Obviously, something is taking up space - like extra code, perhaps.
- Unexpected, sudden changes occur with the hard-disk status information, which should be investigated.
- Abnormal program behaviour occurs, indicating that the program has been corrupted.

If you suspect that your software has been contaminated, you may have to consider the use of a virus-checker program – of which there are several currently in the marketplace. But if you are a true hacker, you may consider performing operating-system file comparisons between good and suspected files. Usually, the virus is found in the operating system of the computer – thus localizing the problem.

Once found, the contaminated file should be destroyed. It is usually not cost-effective to repair system files; rather, reboot with known good files - an application of the first law of computing: "Always make backup copies of newly purchased or generated software."

Worms and viruses can enter your computer in a number of ways.

- Via a modem which connects your computer to a public bulletin board, the programs on which have been contaminated by a cracker;
- Via network nodes, assuming that your computer is connected to that network;
- Via contaminated data disks swapped with your "friends";
- By using public-domain software which has been purposely infected;
- By using commercially purchased software (despite seal) on which the virus has been inadvertently copied by a legitimate retailer. A company in the Far East was caught selling pirated software which the vendor had purposely contaminated.

By now, you may be apprehensive that you may own infected software. Be encouraged that the hardware is unaffected. Given the variety of applications and systems, no single suite of preventive measures can provide absolute protection.

Let us now consider some cures:

- If you have identified bad software, throw it away. There is no point in keeping it; it is too difficult to fix.
- If your hard disk is contaminated, reformat it. This action will cleanse the disk so that you can reload it with good programs or data. But remember that worms and viruses like to hide in operating systems; therefore, ensure that the reloading operating system is also pure.
- Pay attention to the quality of the software t you acquire. Run it through a virus-checker before you use it. If in doubt – to prevent destruction of stored files – never load this software into your hard disk.
- Ensure that all good software is duplicated as back-up; then apply write-protect tabs. This will prevent unauthorized entry.
- Form the habit of using system randomly generated passwords and file locks in order to frustrate strangers to your data or entry by crackers.
- Restrict the use of interconnections or networking to unreliable systems and bulletin boards.
- Make the use of audit trails if you design systems or, if you are a user, save statistics on your software for comparison later on. Note indications of deviations from normal behaviour.

Working with complex software is difficult enough, but working with infected software is the height of frustration.

About the Author:

William van Leeuwen is a Certified Engineering Technologist with the Ontario Association of Certified Engineering Technologists and Technicians (OACETT). He has been a member of OACETT since 1969. He retired from military service in 1976, and in 1984 became involved in the Canadian Frigate Project as the support software manager.

Mr. van Leeuwen is a regular contributor "The Ontario Technologist", from the May/June 1990 issue of which publication this article was reproduced. □



Donna Bilodeau, Publication Secretary

Mindbender #3

By J.A.E. Belagus, P.Eng.

Write an equation for the straight line passing through the points A (-3,4) and B (5,-2).

ANSWER: $3X + 4Y - 7 = 0$

Engineering Students Attend Conference on Student Publications

By: Martin Bima and Paul Godavari

Engineering student publications are considered to be the voice of engineering students across the country. These newspapers and other forms of publication presented a negative image of engineers in the past. Even though almost all of these publications have changed their format, it was deemed necessary to bring the publishers together to discuss the problems of the past and the goals for the future; and the Canadian Engineering Student Publications Conference made it possible for this to happen. Fifteen schools attended this conference, including Simon Fraser University on the west coast, University of Manitoba on the prairies, and University of New Brunswick on the east coast. The publishers of each of the schools were there to learn how to reverse the damage done in the past.

The conference began with each engineering society giving a detailed presentation on the state of its publication. This included problems encountered in the past and the present in addition to successes attributed to their new format. One important theme emerged from these presentations: that all engineering societies were united in the stand to improve the quality of their publications and in turn, improve the perception of engineering students.

Following the initial presentations, the CESPC was organized into a speaker and workshop format. The speakers included a variety of prominent journalists, editors and engineers, foremost amongst whom was Claudette MacKay-Lassonde. She set the tone of the conference with a moving speech on the importance of engineering publications and how they project an image, whether good or bad, on all engineers – both students and professionals. She stated that the engineering profession was tarnished by past acts, and told us that we are responsible to reverse that image. She closed by saying that she was impressed that the students of today are working to improve the public perception, but that more needs to be done. John Bate (president of APEO) also conveyed his support toward the students' desire to change their publications. He emphasized that when we enter into a school of engineering, we become junior engineers, and we have a direct impact on professionals.

The workshops offered an opportunity for small groups of student editors to discuss with professionals such topics as management techniques, advertising, rights and responsibilities, technical writing, cartooning, and public relations. Marg McCaffery, manager and editor of Engineering Dimensions, conducted a most helpful workshop on management. Her talk and accompanying guides assisted us in the methods of organizing staff, production schedules, and some editing techniques. Donna Reid, marketing coordinator of Engineering Dimensions, spoke on innovative ways to financially support the publications.

Klaus Pohle, of the Carleton School of Journalism, presented the legal aspects of publishing newspapers. This was probably the most important workshop because it laid down strict guidelines to follow in order to properly edit articles. The public relations workshop was conducted by Kathy Wood of Wood and Wood Associates. She discussed methods of giving interviews and press releases as well as organizing a public relations campaign with respect to engineering student publications.

The publication of the University of Manitoba Engineering Society, the Red Lion, has had its share of problems in the past. The content of the paper was changed one year before the conference, but the conference helped in areas that were desperately lacking. For example, since attending CESPC, we have increased our staff five-fold, and we are more confident in managing, editing, and producing the Red Lion. We have adopted a firm editorial policy, and are currently trying to work more closely with industry and the Professional Association.

The main problem we face is combatting the negative publicity generated by the past publications not only from Manitoba but all engineering societies. As each society presented its final remarks at CESPC, there were feelings of both regret for past mistakes and unity in our position to improve our publications and, in turn, the image of engineering.

Finally, we would like to thank the Association of Professional Engineers of Manitoba and the Dean's Office of Engineering for providing the opportunity to attend such an important conference. □

News From Across Canada

By: B.A.K. Danielson, P. Eng., and H.S. Zbigniewicz, P. Eng.

Alberta

APEGGA assisted the Alberta Department of Education in the development of a science program to benefit all students pursuing a career in science. An APEGGA ad hoc committee on education has identified strategies designed to counter projections that an inadequate supply of Alberta – trained high school graduates is qualified to enter the faculties of engineering and science, to meet existing and future requirements for the province and the country.

APEGGA's council has approved a recommendation to retain an external consultant to improve the image of APEGGA's constituent professions in the eyes of the public as well as its membership.

British Columbia

The University of British Columbia is planning Canada's first graduate program in fire protection engineering. The only other such program in North America is at the Worcester Polytechnic Institute in Massachusetts. The program will provide graduates with a better understanding of fire science and technology. It will also focus on fire safety, fire codes and regulation, material resistance to combustion, fire control systems, and crowd behavior in the aftermath of an earthquake or explosion. Currently, fire losses cost Canadians more than $750 million annually. As well, Canada has the highest number of fire deaths per capita of any western country. □

President's Term

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liability to the mentors. Ken mused that engineers seem forever to be beholden to the implications suggested by the lawyers.

Ken would like to see the mentor programme implemented.

Sector-Specific Guidelines

While Ken believes that Guidelines for Specific Practice can be of use in client/engineer relationships, he expresses concern that these requirements, which are for the most part minimum requirements, may become the maximum requirements, thereby limiting the quality of service provided to the client. Ken disapproves of checklists, his concern being that engineers may tend to follow the procedure rather than think about what is actually required.

Engineers in the Community

Ken expressed his pleasure at the number of occasions on which the Association had been approached by various sectors of the community to provide engineers to serve on committees. In general, he considers this to be a good indication of the recognition of the role of the engineer.

Mission Statement

A powerful accomplishment of the Association during Ken's term as President was the establishment of a new outline of mission and purpose for the Association.

Vice-President

Another accomplishment of Ken's was the provision for the "automatic" accession of the vice-president to the presidency, without the requirement for an election and all of the associated uncertainty.

On-going Concerns

As past-president, Ken hopes to see a number of additional developments. One of his "pet" projects is, and will continue to be, the redevelopment of the committee structure. It is virtually impossible for Council to keep track of the present 18 standing and 6 ad hoc committees, and Ken would like to see the committee structure reviewed, particularly with regard to the relationship of the committees to Council. Ken feels that Council has to become more of a policy-making body, providing committees with policies upon which they can act without the involvement of Council.

Ken would also like to see more of an effort made toward the enhancement of the image of the engineer.

We are certain that there are many other points one could mention, for Ken is a very enthusiastic person. One sees a very sincere dedication and much involvement of personal time to undertake and accomplish what he has done in twelve Council meeting and one short year.

We enjoyed the interview. □

Gerald J. Maier, P.Eng.

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Patrons of the Calgary Military Museum Society; and a National Campaign Patron of National Mental Health.

Personal awards include the 1973 Canadian Institute of Mining and Metallurgy Past President's Memorial Award, and his 1984 appointment as Honorary Lieutenant Colonel and the 1987 appointment as Honorary Colonel of the King's Own Calgary Regiment.

Mr. Maier was also elected a Fellow of the Canadian Academy of Engineers in 1989.

An engineer with a truly diverse and involved personal and professional life was honored with the 1990 CCPE Gold Medal Award.

Our congratulations to Mr. Gerald J. Maier, P. Eng.: an exemplary engineer. □

CCPE National Scholarships

The Canadian Council of Professional Engineers (CCPE) is pleased to announce its National Scholarship Program for 1991. The scholarships are sponsored annually by CCPE through its National Awards Program. This year, $37,500 will be offered through 6 scholarships which aim to encourage the achievement of excellence in the Canadian engineering profession through the promotion of advanced studies and research programs.

The following scholarships are available in 1991:

- The North American Life Scholarship program will offer three scholarships of $7,500 each annually to provide financial assistance to engineers returning to university for further study or research in an engineering related field.
- The Optimum Scholarship program will offer two scholarships in the amount of $5,000 each to provide financial assistance to engineers returning to university for further study or research in a field other than engineering. However, the field of study chosen should favour the acquisition of knowledge pertinent to enhancing the performance of the candidate in the engineering profession.
- An Encon Endowment in the amount of $5,000 will be awarded to a professional engineer wishing to pursue studies in the area of engineering failure investigation.

To be eligible for the programs, candidates must:

- be registered Professional Engineers
- have been accepted for post-graduate study by a recognized university.

The deadline for all applications is May 1st, 1991.

For further information, please contact:
Lorelei Scott
National Scholarship Program
Canadian Council of Professional Engineers
401-116 Albert Street
Ottawa, Ontario K1P 5G3
Tel: (613) 232-2474
Fax: (613) 230-5759

Coming Events

Canadian Committee on Women in Engineering

WOMEN IN ENGINEERING FORUM

Regina, Saskatchewan
February 26, 1991
Chair: Dr. Monique Frize, P. Eng.
Contact: Jeanne Inch
Phone: (506) 453-4515

WOMEN IN ENGINEERING: MORE THAN JUST NUMBERS

May 21-23, 1991, Fredericton, New Brunswick
Contact: Dr. Monique Frize, P. Eng.
c/o Faculty of Engineering
University of New Brunswick
Fredericton, New Brunswick E3B 5A3
Phone: (506) 453-4515
Fax: (506) 453-4516

WATERSCAPES '91

June 4-9. 1991
Saskatoon, Saskatchewan
International Conference on Water Management for the Sustainable Environment.
Co-sponsored by Canadian Water Resources Association.
International Exposition will be held in conjunction.
Contact: M.D. Osborn,
General Manager, Waterscapes
3-3002 Louise Street
Saskatoon, Saskatchewan
S7J 3L8
Phone: (306) 373-9089

1991 NATIONAL CONFERENCE ON NOISE CONTROL ENGINEERING

July 14-16, 1991, at Tarrytown, New York (25 miles North of New York City).
Theme - "Noise Control – 20 Years of Progress"
Contact: Noise - Con 91 Conference Secretariat
P.O. Box 2469 Arlington Branch
Poughkeepsie, NY, 12603 U.S.A.
Phone: (914) 462-4006

XVIII INTERNATIONAL CONGRESS OF REFRIGERATION

August 10-17, 1991 - Montreal, Quebec
Theme - "New Challenges in Refrigeration"
Contact: S. Bittner, Coordinator
XVIII International Congress of Refrigeration
St. Hyacinthe, Quebec
Phone: (514) 773-1105
Fax: (514) 773-8461

Associate Committee On Shorelines

WORKSHOP ON ENVIRONMENTAL ISSUES FOR SHOREZONE DESIGN.

September or October 1991 - Ottawa Region - 2 days of technical sessions
Contact: M.W. Mulcahy, P. Eng.
Dept. of Fisheries & Oceans
Ottawa, Ontario K1A 0E6
Phone: (613) 993-2973
Fax: (613) 952-6788

Calls for Papers

CANADIAN DAM SAFETY ASSOCIATION 3RD ANNUAL CONFERENCE

Whistler, B.C. - September 16-19, 1991.
Abstracts up to 1000 words on theme of natural hazard risk reduction as it applies to dam safety.
Deadline January 31, 1991.
Contact: D. Cattanach, B.C. Hydro
Vancouver, B.C. V6Z 1Y3
Phone: (604) 663-3126
Fax: (604) 663-1887

CANADIAN ACOUSTICAL ASSOCIATION CONFERENCE

October 9-10, 1991, Edmonton Alberta
Abstracts up to 300 words on acoustics, especially HVAC noise and vibration control, building and ground vibrations and electro-acoustics.
Deadline April 30, 1991.
Contact: Dr. M.G. Faulkner
Dept. Mechanical Engineering
University of Alberta
Edmonton, Alberta T6G 2G8
Phone: (403) 492-3446 Fax: (403) 492-2200

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