

# The CSEM Newsletter



Canadian Society for Engineering Management  
Société canadienne de gestion en ingénierie

A member Society of the Engineering Institute of Canada



Une société adhérente à l'Institut canadien des ingénieurs

June 1998  
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CSEM's mission is to represent the interests and enhance the capabilities of engineers in management in order to advance and promote efficient management of commerce, industry and public affairs.

## FROM THE PRESIDENT



CSEM President,  
Ken Putt, P.Eng., FEIC.

There is an old saying: "If you don't know where you're going, any road will get you there!" Its time for a little introspection for CSEM and for its umbrella organization, the Engineering Institute of Canada. At the next EIC Council Meeting to be held in Ottawa on June 21st, Dr. John Plant, P.Eng., FEIC, the EIC's Past President, will chair a "Visioning Session". All EIC member societies will be represented. The aim of this session is to attempt to chart out the direction of the EIC and its constituent societies into the next century. Where are we now? Where are we going? How are we going to get there? This exercise is nothing new to many of you who struggle with these same questions in your own companies. However, changing demands and new challenges within the engineering profession necessitate a timely re-appraisal of where the EIC "fits in" to the engineering world and how the EIC will remain relevant to professional engineers. Here are a few of my thoughts on the subject. There are three major roles for any not-for-profit engineering organization. The first is regulation. This role is currently filled by the provincial regulatory bodies such as APEGGA, PEO, OIQ,

APENB, etc. They are organized and regulated under a governing statute and report through a government minister. Their primary mandate is public safety. Some of these bodies, such as PEO, are active in promoting engineering as a career and raising the overall profile of the profession. However, they do not, and indeed, because of their disciplinary role, cannot, act as advocates for engineers. Nor do these bodies offer the professional development that they mandate all engineers to engage in. What can EIC offer that the regulatory bodies cannot or will not offer to the profession? Advocacy is one element. The opportunity for life-long learning is another. Services in the form of insurance plans, credit cards and rental car discounts is another option. Recently, the Canadian Society of Professional Engineers (CSPE) has had a renaissance. This body has modeled itself after advocacy/services groups of the legal (the Canadian Bar Association) and the medical professions (Canadian Medical Association). If the CSPE intends to speak for engineers, should EIC raise its voice on behalf of engineers? Does the EIC have an advocacy role when its membership encompasses a mere fraction of total engineers in Canada? My view is that EIC's role, and hence that of CSEM, in the engineering world is continued competency through life-long learning. Continued professional development is the bridge between advocacy (public opinion) and regulation (public confidence). The EIC should let others charge forth and take the thorny high ground of regulation or advocacy. We should be tasked to roam and seed the vast fertile plains of life-long learning. In this way, the EIC will discharge its most important function to all engineers in the 21st century.

Ken Putt, P.Eng., FEIC.

HAVE YOU SEEN OUR WEB PAGE AT

[WWW.CSEM-SCGI.CA](http://WWW.CSEM-SCGI.CA)

ARE YOU KEEPING UP ON  
LOCAL BRANCH EVENTS?  
WHAT WOULD YOU LIKE TO  
SEE THERE? LET US KNOW.

CSEM is seeking a volunteer to manage its website. If you or someone you know is interested in becoming the CSEM Webmaster, please contact Gord.Thomson@sympatico.ca. It is not a big job for someone who is familiar with HTML.

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## FROM THE EDITOR

This is our third edition of the CSEM Newsletter. So far we have been able to maintain publication on a quarterly basis. However, gathering material for this newsletter is a challenge. As Chair of CSEM's Ottawa Chapter, I organized a "Breakfast Eye-Opener" in May featuring Janice Calnan speaking on people management issues. We had a small but spirited group who enjoyed the opportunity to share viewpoints on leadership and management. One of the participants told me afterwards how useful it was to be able to share experiences with professionals facing the same issues. I was pleased to hear this. After all, that is one of CSEM's goals. This edition of the newsletter gives an overview of Ms. Calnan's discussion group. There are lots of ideas and experiences within CSEM membership that would make interesting reading. I would be happy to receive short articles (or long ones) from CSEM members and publish them in our newsletter. This is our publication and we can use it to communicate with each other. Share your thoughts with our members. Put "pen to paper" and send them to me.

*Gord Thomson, P.Eng., LL.B.*

## FROM THE BOARD

The AGM was held in Ottawa on June 21st. Agendas and minutes were distributed. Overall the meeting was a success. A quorum was achieved and all items on the agenda satisfactorily resolved. The new Board of Directors comprises the following individuals:

Ken Putt, Victoria, President  
Gord Thomson, Ottawa, Secretary/Treasurer  
Jim Gordon, Vancouver  
Colin Campbell, Calgary  
David Reid, Calgary  
Lorne White, Edmonton  
Brian Lechem, Toronto  
John Dinsmore, Montreal

*Gord Thomson, P.Eng., LL.B.  
Secretary/Treasurer, CSEM*

# Intelligence - The Key to Success

The CSEM Ottawa Chapter is pleased to present  
**A day with Denzil Doyle, P.Eng., on**

## MAKING TECHNOLOGY HAPPEN

How to Find, Exploit & Manage Innovative Products,  
Services and Processes

THURSDAY, SEPTEMBER 17, 1998

0900 - 1630

COMMUNICATIONS RESEARCH CENTRE AUDITORIUM  
3701 CARLING AVENUE, OTTAWA, ONTARIO

Program includes coffee, lunch, a tour of CRC's BADLab, and Mr. Doyle's book  
MAKING TECHNOLOGY HAPPEN

**MR. DOYLE IS ONE OF THE PIONEERS OF THE OTTAWA-  
CARLETON HIGH TECHNOLOGY COMMUNITY.**

Register Prior to August 17th and take advantage of these early registration fees:

CSEM Members	\$225 (regularly \$250)	CSEM Membership
Other EIC Society Members	\$250 (regularly \$275)	for the remainder
CSEM Student Members	\$100 (regularly \$125)	of 1998 \$25
All Other Full Time Students	\$150 (regularly \$175)	(regularly \$30)
All Others	\$275 (regularly \$300)	

## REGISTRATION INFORMATION

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Student Faculty and University \_\_\_\_\_

Phone: \_\_\_\_\_

Fax: \_\_\_\_\_

E-Mail: \_\_\_\_\_

Fax to Gord Thomson:

**Canadian Society for Engineering Management - Ottawa Chapter**  
1353 Mountainside Crescent, Orleans, Ontario, K1E 3G5,  
Phone (613) 834-6166; Fax (613) 834-6167  
gord.thomson@sympatico.ca

# "PROFESSIONAL ENGINEERS MAKE THE BEST VOLUNTEERS"

by James Scanlan

**T**he Tetra Society of North America is, as the name implies, a society that has set up chapters from coast to coast. It is quickly spreading throughout the USA. It has helped thousands of people with disabilities who couldn't find a solution to their problems anywhere else. Its founder, Sam Sullivan, has achieved recognition as Canada's first quadriplegic city counselor.

But eight years ago there was no Tetra Society - just one man who desperately wanted to live on his own and achieve some measure of independence. Says Sam, "I couldn't get on the toilet, I couldn't open the curtains, I couldn't butter bread. I decided to go out and grab life, but couldn't even open my own door."

Paul Cermak, a retired professional engineer and inventor changed all that. "To me the man was nothing short of an angel - he worked more or less full-time for about six-months solving so many vexing problems and helping me achieve the independence that I was looking for."

Paul utilized his training to solve every problem he encountered, from the simple (bending the blade of a knife 45 degrees so that Sam could butter is bread) to the complex (the invention of a rail assisted transfer device that allowed Sam to move between the shower and the toilet without having to use a wheelchair).

Eight years later Paul is still helping people with disabilities solve their problems, faithfully attending every volunteer meeting. Recently he helped Sam to adjust to new living quarters. Says Paul; "You get a lot of satisfaction helping disabled people. You see the light in their eyes... they sparkle when you do something that makes them independent, and makes their life easier."

Sam Sullivan has observed that, "The best Tetra volunteers, the most dedicated, dependable, and capable people are often professional engineers."

Other longtime volunteers tend to bear out that observation.

Retired engineer Fred O'Kelly has spent hundreds of hours fashioning cup holders for people frustrated by their dependence on someone else to get them a drink of water. At the recent Resna conference Fred was a key speaker at the Tetra showcase, demonstrating the signaling device he had made for Cassie Todhunter, a young girl who is deaf and has cerebral palsy. Until Fred came along she was unable to get the teachers attention or answer question in the classroom.

Jay Drew is another pillar of the Tetra Society in Vancouver. A professional engineer with his own business, Jay nonetheless has found time to complete hundreds of projects over the years and allows free access to his company's workshop to other volunteers. Jay is also a regular at the monthly meetings and has invented everything from a handgripper for a quadriplegic to a portable device to help a woman to weak to raise herself to a standing position.

In Victoria, B.C., chapter head Mary Heppner has described retired engineer John Duffus as "a one-man Tetra". Before the first official meeting of the Victoria chapter in October 1993 John had been working on projects for Tetra for more than one year. When Sue Rodriguez was fighting for the right to a physician assisted death John was developing devices such as a feeding machine to help her be self-sufficient for as long as possible.



Another professional engineer, Douglas Pattison, has been with the Victoria chapter since 1992 and has, among other things, designed a prototype of an eye operated typewriter for use by quadriplegics and has designed computer workstations, in use by the medical services plan of BC. Summing up the attitude of all the professional engineers who work or have worked for Tetra, Doug says "I love helping people and I love to solve problems."

If you feel the same way, the Tetra Society of North America needs your help. We have chapters throughout Canada but there are other communities who need the unique services that Tetra can provide. If you would like to help please contact:

Tetra Society of North America  
Plaza of Nations, Box 27  
770 Pacific Blvd., South  
Vancouver, B.C. V6B 5E7  
Phone (604) 688 6464  
(call collect if necessary)  
Fax (604) 688 6463  
E Mail: tetra@istar.ca  
URL: [www.orcn.ahs.uwo.ca/TETRA](http://www.orcn.ahs.uwo.ca/TETRA)

## MANAGING PEOPLE IS THE KEY TO HIGH TECH SUCCESS MAY 27, 1998

The Ottawa Chapter organized a breakfast seminar addressing people management issues. The discussion was facilitated by Janice Calnan, Senior Consultant, Business Transformation, HST Group, Ottawa. The focus of the discussion was why such a high percentage of engineers fail when promoted to management positions.

Janice was well qualified to lead the discussion having spent many years working with senior executives on change management, company transformation and quality issues. Having studied with W. Edwards Deming in the Deming Study Group for two years, she applies Deming's principles of "Profound Knowledge" when working with her clients. These principles state that managers need to understand and utilize the following factors:

- How people think.
- How people learn.
- The system in which people work.
- Criteria and tools to measure change.

Companies tend to concentrate on the last factor, measurement. In doing so, they ignore 75% of what must be considered to bring about successful change.

Deming, himself a statistician, used to berate his corporate audience: "You have us measuring everything and the things that are really important can't be measured." He was referring to how people think and feel when the system in which they work interferes with their ability to perform. The resulting worker frustration leads to lowered morale and diverts management from the real issues surrounding the concerns of the worker.

The Breakfast Eye Opener participants were asked the following question: "What causes management ineffectiveness in the work environment in the areas of people, productivity and service?" These are some of the management traits and shortfalls that the participants identified:

- No ability to listen.
- Ineffectively mixing management and leadership concepts and behaviors.
- Personality deficiencies.
- Managers promoted beyond competence levels (The "Peter Principle").
- Micromanagement
- Unapproachable and non-communicative.

When asked the question: "Why do managers fail?", participants responded that failed managers:

- Don't listen.
- Don't take ideas and inputs from others.
- Don't know how to build teams.
- Communicate poorly.
- Don't understand their subordinates.
- Have little preparation or training on how to be an effective manager.
- Lack flexibility.
- Have expectations that exceed ability.

### **Soft skills are the hardest skills to learn.**

All of these responses point to an inability on the part of "bad" managers to form working relationships with their subordinates. This failure prevents the formation of bonds of trust and communication between managers and their subordinates.

Participants agreed that mentoring novice managers, creating dual career ladders (management and technical) and instituting management training programs could reduce manager failure rates.

Janice stated that managers tend to believe that they possess the proper skills to manage. Otherwise, they would not have been promoted into management! This faulty self-perception is one of the major blocking factors preventing managers from learning new or correct people skills. She stated that coaching management in people skills helps them overcome their own self-imposed barriers to becoming good managers.

Janice cited a recent Boston based study that identified the following management failure modes:

- 82% do not build partnerships.
- 58% are unclear about expectations from higher management.
- 50% do not have enough internal political savvy to manage people.
- 28% take too long to learn their jobs.
- 25% are unable to create personal and workplace balance in their personal lives.

Engineers are trained to "find the right technical answer", a much needed skill in their profession. However, one right answer is not always adequate where people are concerned.

Janice Calnan and CSEM will be hosting a one-day seminar on the topic of developing managers in Ottawa in October 1998.

# PROFESSIONAL MANAGEMENT MEANS THE ABILITY TO MANAGE PEOPLE

CSEM OTTAWA CHAPTER PRESENTS A ONE DAY SEMINAR ON

## COACHING AS A MEANS OF EMPLOYEE RETENTION IN THE HIGH TECHNOLOGY INDUSTRY

**Date:** Wednesday, October 14, 1998  
**Location:** Ottawa Business Inn, McLaren  
at Elgin, Gilmore Room  
**Time:** 0900 - 1630

Coffee and lunch is included.  
Ample parking nearby in RMOH HQ  
and Place Bell.

### Seminar Fees:

**Prior to September 1, 1998**  
CSEM Members: \$250.00  
CSEM Student Members: \$125.00  
Other EIC Society Members: \$275.00  
All others: \$300.00

**After September 1, 1998**  
CSEM Members: \$300.00  
CSEM Student Members: \$150.00  
Other EIC Society Members: \$325.00  
All others: \$350.00

Employee retention is a management issue! Drawn by challenge and creative opportunities employees move from company to company. Research indicates that this migration is considerably less when employees feel valued and listened to. Higher salaries may attract your employees to other companies but that's only part of the equation. Properly managing your employees is the key to retaining them. A company's real competitive advantage lies in managing your intellectual capital and coaching the people you already have.

In this hands-on seminar participants will learn the deeper reasons why good people leave, how current trends in management thinking unintentionally contribute to the problem and how to address real concerns of employees. Participants will also plan some "next step actions" in coaching their employees towards an expanded menu of positive outcomes.

**With: Janice Calnan**

HST Group Ltd, A Calian Company  
Ottawa, Ontario

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gord.thomson@sympatico.ca

## MANAGEMENT TIPS FOR ENGINEERS

Courtesy of Dr. Tofy Mussivand,  
University of Ottawa, School of  
Graduate Studies.

### CHARACTERISTICS OF CREATIVE MANAGERS

Personality traits cannot be pigeon-holed into neat categories. However, evidence suggests that creative people share the following characteristics:

- An ability to sense and characterize problems;
- Identifies non-ordinary situations;
- Sees problems as opportunities;
- An ability to formulate solutions;
- Generates many alternative solutions;
- Ability to meet needs;
- Originality;
- Uniqueness;
- Gives extra effort to break out of the "box";
- Flexibility;
- Accommodates change;
- Reacts well when the plan goes awry;
- Drive;
- Assertive and confident;
- Motivated by the pleasure of the work;
- Organizational Ability;
- Finds the starting place;
- Evaluates and implements;
- Analytical Ability;
- Abstract thinker;
- Breaks down complex problems into manageable components;
- The ability to synthesize information;
- Bring seemingly unrelated concepts and ideas into a working solution;
- Not easily confused or misled;
- Imagination;
- Ability to take ideas, concepts, objects and people and use them in new ways; and,
- Ability to take old ideas and apply them to new situations.

No one characteristic by itself makes a person creative. Each of these characteristics can be strengthened through professional development.

# CSEM NEEDS YOUR INPUT FOR CONTINUING PROFESSIONAL DEVELOPMENT PROGRAMMING

Please take a few moments and respond to the following questionnaire. **Tear it out and then fax it to Gord Thomson at 613 834 6167.** This will help CSEM provide its members and the engineering community at large appropriate formal professional development opportunities which may merit CEUs or PDHs. We appreciate your input.

## What types of courses should CSEM offer?

Check as many as you wish.

- Strategic Alliances and Partnerships
- Project Management
- People Management & Leadership
- Managing Technology and Innovation
- Personal Career Management
- Writing and Presentation Skills
- Specialized Computer Skills such as HTML (not word processing)
- Finance issues (personal and corporate)
- Engineering ethical issues
- Intellectual Property Law
- Construction Law
- Environmental Law
- Occupational Health and Safety Law
- Alternate dispute resolution
- General overview of law relevant to engineers
- Directors' and Officers' liability.
- Professional liability.
- Other legal topics: \_\_\_\_\_
- Other management topics (Please describe them.)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## How long should these seminars last?

- A full day.
- Half-day.
- A few hours.

## How much are you willing to pay for:

- Full day seminar     \$500     \$400     \$300
- Half-day seminar:     \$300     \$200     \$150
- A few hours:         \$30     \$20     \$10

## When should these activities be held?

Check your preferences. Indicate first or second if you wish.

- September to December
- January to May
- May to August
  
- Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday
- Sunday
  
- am (for half day or less)
- pm (for half day or less)

Should the seminars be in house, that is, at your  
 workplace or in a  hotel conference room?

**Thanks for your help.** This information is really important to us.

# PEO Student Papers Night, Ottawa

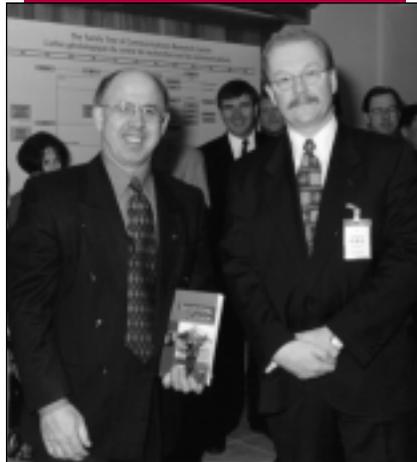
The CSEM Ottawa Chapter was pleased to provide support for the 1998 Ottawa Area Student Papers Night. Our contribution towards prize money resulted in \$1200 worth of cash prizes as well as packages of software donated by Corel Systems. The purpose of the awards night is to support young engineers in their pursuit of excellence. The photo shows the 1998 PEO Student Papers Team Award being presented to Carleton University.



Left to Right: Heather Stewart "Predicting Sediment Loading in the South Tobacco Creek" - First Place Overall. Kim Bucci "Corrosion of Stainless Steel Body Implants" - Best Commercial Application. Ken McMartin, Carleton University Staff. Wayne Bennett Student Papers Chair Presenting the Foulkes Trophy to Ken McMartin.

## OTTAWA CHAPTER'S APRIL 27TH IP AND LICENSING SEMINAR A BIG SUCCESS

The CSEM Ottawa Chapter held its intensive one-day seminar on identifying, protecting and licensing intellectual property assets for profit on April 27th at the Communications Research Centre Auditorium, 3701 Carling Avenue. In the morning session, a variety of speakers addressed the legal and practical issues of patents, trade-marks, industrial designs and copyright. In the afternoon participants learned about the business practicalities of licensing. CRC graciously provided their auditorium for the session and catered lunch for speakers and participants. As an added treat, CRC provided lunch hour tours of their Broadband Application's Laboratory (BADLab).



Gord Thomson, P.Eng., LL.B., Chair of the Ottawa Chapter and Seminar Organizer (right) presenting Graham Taylor of CRC the book "Inventing Canada - One Hundred Years of Innovation" authored by Roy Mayer and published by Raincoast Books, Vancouver.

Speakers and participants in a group photo.



### The CSEM Newsletter

DO YOU HAVE A SHORT ARTICLE OR ANNOUNCEMENT YOU WISH PUBLISHED?

WOULD YOU LIKE TO PLACE AN ADVERTISEMENT IN THIS NEWSLETTER?

IF SO, PLEASE WRITE  
EDITOR@CSEM-SCGI.CA

**Next issue will be published  
on September 30 1998.**

**The deadline for articles or  
advertising is September 15, 1998.**

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# INGÉNIEURS ET FORMATION CONTINUE

“Dans une période de changement radical, l’avenir appartient à ceux qui apprennent” —Eric Hoffer

## CONTEXTE

L’Académie a récemment publié un rapport sur ce sujet. Ce document résume les points saillants identifiés dans le rapport, cite des exemples de directives pour les divers participants et conclut au besoin d’action.

## LE DÉFI

La formation continue est aussi essentielle à l’ingénieur que sa formation initiale et son enregistrement à la profession. Le développement professionnel continu est un impératif urgent pour assurer la sécurité du public, un environnement soutenable, une économie nationale concurrentielle, une profession respectée, un employeur profitable et une carrière satisfaisante. Même si le défi s’adresse à tous les ingénieurs, les mesures requises pour maintenir les compétences individuelles et collectives varient parmi les individus. Les ingénieurs au service de grandes entreprises ont habituellement accès à des programmes internes de formation et de développement professionnel. et le maintien de la compétence est essentiel au succès de leurs carrières.

### ***La compétitivité, une locomotive de l’économie nationale***

Les grands bureaux de consultation et de gestion peuvent aussi avoir des programmes internes, mais l’apprentissage se fait en majeure partie par la participation à une grande variété de projets pour divers clients. Les ingénieurs autonomes ou les ingénieurs à l’emploi de petites entreprises n’ont pas d’accès immédiat à des programmes de développement professionnel, et le processus d’apprentissage est généralement limité à l’expérience acquise sur les projets de leurs clients. Ce dernier groupe a donc besoin d’un système formel de formation continue supporté par nos institutions d’enseignement supérieur qui s’ajoute à l’expérience au travail pour assurer une compétence professionnelle continue.

## RESPONSABILITÉS ET TENDANCES

La croissance professionnelle relève d’abord et avant tout de l’ingénieur lui-même. Les

ingénieurs doivent établir un plan de carrière et s’assurer que leurs compétences s’améliorent pour rencontrer les défis de tâches variées. Ceci peut se faire au travail en utilisant des réseaux informels d’information et par instruction formelle. Toutefois, il existe plusieurs autres participants dans le processus de formation continue, y compris les employeurs, institutions d’enseignement, sociétés savantes et associations professionnelles.

### ***La responsabilité relève d’abord de l’ingénieur individuel***

Certains groupes d’ingénieurs recommandent qu’un minimum d’UEC (Unités d’éducation continue) accréditées soit exigé annuellement pour le renouvellement du permis d’exercice. Les critères de UEC sont maintenus par l’International Association for Continuing Education and Training. L’Institut canadien des ingénieurs (ICI) est un agent autorisé de UEC.

## DIRECTIVES ET MEILLEURES PRATIQUES

Plusieurs organisations ont développé leurs propres procédés et techniques pour maintenir et améliorer la compétence des ingénieurs. Un aperçu de ces exemples suit; pour une description complète voir ref. 1

### **Entreprises**

Ligne directrice: au moment de l’emploi, établir un contrat écrit ou virtuel entre l’employeur et l’employé déterminant l’engagement des deux participants à la formation continue.

Suivant la taille et la nature de l’organisation, différentes pratiques peuvent être décrites dans le “contrat” telles que dans les exemples suivants:

- pour les grandes entreprises de production — établir méthodologie formelle d’appui au sein de l’entreprise comportant la préparation de plans individuels de développement compatibles avec la lacune de compétence et les attentes de carrière de l’employé.
- pour les grands bureaux de consultants — financer des études internes d’une

industrie ou d’un sujet dans un but de développement commercial ainsi que pour agrandir les frontières de la connaissance des professionnels internes.

- pour les petites et moyennes entreprises (PMEs) — utiliser sciemment certaines ressources résultant des activités d’affaires journalières, telles que l’interaction avec les clients, fournisseurs, collègues et associations industrielles.

### ***Utiliser les ressources disponibles dans les activités d’affaires journalières***

### **L’ingénieur individuel**

Ligne directrice: préparer et mettre à jour un plan de formation continue compatible avec ses aspirations de carrière, et en discuter avec son employeur et ses collègues.

Voici deux exemples de meilleures pratiques applicables à l’ingénieur individuel:

- documenter ses réalisations principales d’ingénierie, y compris les projets techniques réussis, les contributions majeures en gestion et administration, etc..
- poursuivre agressivement des activités personnelles d’amélioration de connaissance et maintenir un dossier complet des cours offrant des crédits et autres cours sans crédits, ateliers, séminaires, etc. complétés avec succès.

### **Institutions d’enseignement**

Ligne directrice: établir, à titre de mission institutionnelle majeure, des programmes de formation continue pour les ingénieurs.

Voici deux exemples de meilleures pratiques qu’une institution peut adopter: — inclure l’importance de l’engagement à la formation continue dans les procédures d’accréditation et de vérifications internes et externes des départements — offrir des cours adaptés aux ingénieurs diplômés depuis dix ans ou plus, ou aux ingénieurs qui changent de carrière, en mettant l’accent sur les cours avancés de premier cycle dans les domaines sujets à des changements technologiques rapides.

## Sociétés savantes

Ligne directrice: améliorer les qualifications techniques et de gestion des ingénieurs en améliorant l'efficacité des méthodes traditionnelles d'échange d'information.

Voici des exemples de meilleures pratiques:

- favoriser le développement de la technologie dans des domaines multidisciplinaires en collaboration avec d'autres sociétés savantes.
- maintenir un inventaire des services de formation continue disponible y compris ceux qui sont offerts par le secteur privé.

### ***Favoriser le développement de la technologie dans des domaines multidisciplinaires***

## Associations professionnelles provinciales

Ligne directrice: développer des lignes de conduite pratiques pour les divers intervenants dans le processus de formation continue.

Voici deux exemples de meilleures pratiques:

- maintenir des dossiers portant sur la compétence continue des ingénieurs, y compris l'évidence de participation à des cours formels et la reconnaissance des réalisations dans l'exercice de la profession.
- établir des lignes directrices de formation continue pour les ingénieurs occupant des postes de gestion, y compris ceux qui comportent des responsabilités financières, économiques et de ressources humaines.

## CONCLUSION

Un effort concerté est nécessaire pour:

- a) porter ces messages à l'attention de tous les intervenants, particulièrement le message sur l'importance de la formation continue pour l'économie nationale.
- b) encourager l'établissement d'une coalition nationale d'intervenants pour coordonner et promouvoir la formation durant toute la carrière
- c) promouvoir le concept que le premier diplôme n'est qu'un premier pas dans la poursuite de la compétence.

Ref 1: Ingénieurs et formation continue. Académie canadienne du génie, 1997

La présentation ci-dessus est une publication de l'Académie canadienne du génie, dont les membres offrent bénévolement au public canadien des renseignements fiables et à propos sur des questions importantes pour la sécurité, la santé et la politique publique.

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# Licensing Executive Society (U.S. and Canada) 1998 Spring Meeting COMMERCIALIZING ENVIRONMENTAL SOLUTIONS

April 16 - 18, 1998. Vancouver, BC.

I had the opportunity to attend the 1998 LES Spring Conference that was held in Vancouver in April of this year. The theme was "Commercializing Environmental Solutions". It was a well attended conference (Vancouver in April!) and many viewpoints on the topic of commercializing environmental technologies were exchanged. This is a small sampling of what I heard:

John Oliver, President of Maple Leaf Bio-Concepts spoke on the subject of Canada's agri-industries and that the future of this business will be shaped by four factors:

1. Developing countries will diversify their food sources and move away from a nutrition base of starch foods towards animal protein and vegetable oils as they industrialize. As fish stocks decline there will be an increasing reliance upon "land based" animal proteins and therefore an increase in the demand for feed grains.
2. As baby boomers and generation "X"ers get older, issues of health and longevity for them and their pets will become more important. The development of a "nutriceutical" industry will take place.
3. Environmental sustainability will become increasingly difficult as agricultural areas and human habitation areas conflict. Increasing farm animal populations will add stress on the environment. Heavily populated and

environmental conscious countries such as Taiwan and Holland are cutting back on hog production because of pollution concerns. This will open opportunities in other countries.

4. Plant products will increasingly be relied upon as a source as feed stock for industrial processes as traditional feed stocks such as oil run low.

John Oliver concluded that:

1. Biotechnology will be the emerging industry of the 21st century.
2. Innovation will come from individuals and small companies not big corporations.

Mark Andrew Smith, Senior Patent Counsel with Shell Oil Company spoke on the issue of Commercialization of the Environment - A Genetic Resource. He described the new opportunities in "bioprospecting" to search for new enzymes and catalysts that will have a significant impact on many industries such as food and pharmaceutical. Mr. Smith stated that there is a need for strong intellectual property rights to protect biological innovations.

Overall, I found this seminar to be very informative and worth while attending. For more information on the LES, their web site is located at [www.les.org](http://www.les.org).

Gord Thomson, P.Eng., LL.B.

## ANNOUNCEMENTS

Ken Putt, P.Eng., FEIC, CSEM President, was presented with a plaque by the University of Calgary Dean of Engineering, Dr. Chan Wirasinghe, at the May 29, 1998 U of C Engineering Associates meeting. The plaque was "In Recognition of Outstanding Volunteerism". The meeting was attended by Colin Campbell, CSEM Director and CSEM/EIC Past-President; David Reid, CSEM Director-Elect; the U of C Chancellor and U of C President.

The University of Calgary Engineering Internship Program (EIP) is seeking qualified employers to provide 12 month engineering work terms beginning in September 1998 for qualified engineering students who have completed three years of engineering studies in the following disciplines: Civil, Chemical & Petroleum; Computer, Electrical, Geomatics/Surveying, Manufacturing, Mechanical and a new programme in Oil & Gas Engineering. For additional information on EIP contact:

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# LIFELONG LEARNING FOR PROFESSIONAL ENGINEERS

BY: DR. C.W. BOWMAN, FCAE

“In a time of drastic change, it is the learners who inherit the future”—Eric Hoffer

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## BACKGROUND

The Academy has recently published a report on this subject. This paper summarizes key issues identified in the report, gives examples of guidelines for the various stakeholders, and identifies a need for action.

## THE CHALLENGE

Lifelong learning is as essential for Professional Engineers as their initial training and certification. Continued professional development is an urgent imperative to ensure public safety, a sustainable environment, a competitive national economy, a respected profession, a profitable employer, and a fulfilling career.

Although the challenge is common for all engineers, the actions to maintain individual and collective competencies vary among practitioners. Engineers working in large companies usually have access to in-house training and professional development programs, and career success requires the maintenance of competence.

***One driving force is competitiveness of the national economy***

Large consulting and management companies may also have in-house programs, but learning in large measure comes from participation in a wide variety of projects with diverse clients. Self-employed engineers or those working in small companies usually do not have ready access to professional development programs, and the learning process has generally been restricted to on-the job experience on client projects. For all the above groups, a formal continuing education system, which may involve our advanced

education institutions, is needed to supplement their on-the job learning experience.

## RESPONSIBILITIES AND TRENDS

The primary responsibility for professional growth must ultimately rest with the individual engineer. Engineers must establish career paths and ensure that their technical competencies grow to meet the challenges of varying assignments. This can be done on the job by using informal networks of information and by formal instruction. However, there are many other participants in the lifelong learning process, including employers, educational institutions, technical societies, and professional licensing bodies.

***The primary responsibility rests with the individual engineer***

Some engineering organizations have recommended that a certain minimum number of accredited continuing education units (CEU's) be obtained each year in order to renew one's professional licence. CEU standards are maintained by the International Association for Continuing Education and Training (IACET). The Engineering Institute of Canada (EIC) is an Authorized CEU Sponsor.

## GUIDELINES AND “BEST PRACTICES”

Many organizations have developed their own approaches and techniques to maintain and improve the competency of engineers. Examples of these are summarized below, for a more complete description see Ref. 1.

### Companies

Guideline: establish at the time of hiring a written or implied contract

between the employer and the engineer, setting out the commitments of both parties to lifelong learning.

Depending on the size and nature of the organization, different practices can be described in the “contract” as noted in the following examples:

- for large production companies—establish a supporting formal methodology within the corporation, involving the preparation of individual lifelong learning development plans consistent with an employee's proficiency gaps and career expectations.
- for large consulting companies—finance internal studies of an industry or an issue for purposes of both business development and to push the boundaries of knowledge of internal professionals.
- for Small and Medium Size Enterprises (SMEs)—consciously use some of the resources that arise in day-to-day business activities, such as interactions with customers, suppliers, colleagues and industry associations.

***Use the resources available in day-to-day business activities***

### Individual Engineer

Guideline: prepare and periodically update a lifelong learning plan, consistent with one's general career aspirations, and discuss with one's employer and colleagues.

Two examples of best practices that an individual engineer can apply are:

- document major achievements in engineering, including successful

(Continued on page 12)

technical projects, major management and administrative contributions, etc.

- aggressively pursue self-directed lifelong learning activities, and maintain a full record of the successful completion of formal credit and non-credit courses, workshops, seminars, etc.

### Educational institutions

Guideline: establish lifelong learning programs for engineers as a major institutional mission.

Two examples of best practices that an institution can adopt are:

- include the extent of commitment to lifelong learning in internal and external departmental reviews and accreditation procedures.
- provide courses specifically designed for engineers who have graduated ten or more years earlier, or engineers making career changes, with emphasis on senior undergraduate courses in areas undergoing rapid technological change.

### Technical Societies

Guideline: Improve the technical and management skill of engineers by enhancing the effectiveness of traditional information sharing channels.

Examples of best practices are:

- promote technology development in multi-disciplinary areas in collaboration with other technical societies.
- maintain inventory of the continuing education services available, including those of private sector service providers.

### ***Promote technology development in multi-disciplinary areas***

### Professional Licensing Bodies

Guideline: develop and monitor practical approaches and practices for the various participants in the lifelong learning process.

Examples of best practices are:

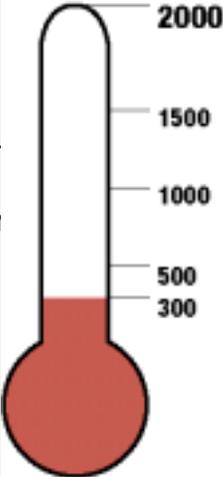
- maintain records bearing on the continuing competence of professional engineers, including evidence of participation in formal courses and recognition of achievements in the profession.
- establish lifelong learning guidelines for engineers in management positions, including those having financial, economic and human resource responsibilities.

## CSEM

### "Project Y2K"

To celebrate the new millennium CSEM is undertaking an aggressive recruiting campaign  
Our goal —

## 2000 members by the year 2000



We'll be calling on all members to assist us in achieving this goal. Watch this corner for updates.

### CONCLUSION

A concerted effort is needed to:

- (a) Bring these messages to the attention of all those involved, particularly the message about the importance of lifelong learning to the national economy.
- (b) Encourage the establishment of a national coalition of stakeholders to coordinate and advance career long education.
- (c) Promote the mind-set that the initial degree is only the first step in the pursuit of engineering competency.

Ref 1: Lifelong Learning for Professional Engineers. Canadian Academy of Engineering, 1997

This is a publication of the Canadian Academy of Engineering whose Fellows volunteer to provide reliable and timely information to the Canadian public on issues which are important to safety, health, and public policy.

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