

The
CSEM Newsletter

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.



Canadian Society for Engineering Management
 Société canadienne de gestion en ingénierie

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A member Society of the Engineering Institute of Canada



Une société adhérente à l'institut canadien des ingénieurs

CSEM's 1999 Ottawa IP and Licensing Seminar a big Success

The Ottawa Chapter hosted the 3rd Annual CSEM IP and Licensing Seminar last April. This time CSEM was generously sponsored by Materials and Manufacturing Ontario. Turn-out was excellent and CSEM, once again, thanks the Communications Research Centre for its auditorium. Yes! We even made some money.

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Reverse engineering

When is it legal?

“...the term ‘reverse engineering’ is not a talisman that may immunize the theft of trade secrets.”¹

Although reverse engineering is generally an accepted and lawful practice, care must be taken to avoid breaking intellectual property laws.

by Gord Thomson, P.Eng., LLB, FEIC

Reverse engineering (RE) is a multistage process aimed at using capital resources efficiently and increasing productivity.² It generally involves developing a set of functional specifications for a product, system or piece of equipment, based on an analysis of an existing product, system or piece of equipment.

Frequently, engineers use reverse engineering to obtain quick solutions to design and maintenance problems. Generally, RE is an accepted and lawful practice in industry. However, because it involves gathering data and copying, it can violate the intellectual property rights of others. If you are contemplating using RE, you should be apprised of the relevant areas of intellectual property law.

BASIC PRINCIPLES

There are three basic principles to keep in mind when considering intellectual property rights:

- copying material in the public domain is permissible and ought to be encouraged;
- there is no law against fair competition; and
- one who copies should be encouraged to improve on what’s being copied.³

Intellectual property law defines what a copy is, when such copying is illegal and provides mechanisms to hold illegal copying and unfair competition in check.⁴

PATENTED MEANS PUBLIC

Patents are issued under the *Patent Act*.⁵ One purpose of the patent system is to put new technologies into the public domain so they can be copied, adopted and improved upon.

However, in exchange for a full disclosure of the invention to the public, the government gives the patent holder an exclusive monopoly to make, sell and use the patented invention for a period of 20 years, commencing on the date the patent application is filed.⁶ The monopoly permits the patent holder to recoup research, development and production costs related to the invention and profit from it.

Therefore, although the public has access to a description of the invention, without authorization, the patent must expire before the description can be used to make, use or sell the article. Generally, any unauthorized use or manufacture of a patented invention before the patent expires is infringement.

Since an inventor must give a full disclosure of how an article works to obtain a patent, RE of a patented article may not be necessary; all of the information you are seeking may be contained in patent documents.

The Patent Act does allow patents to be used for experimentation, private and non-commercial use or use on a non-commercial scale. For example, RE of a patented chemical compound to determine its constituent ingredients and their proportions would not be considered infringement unless this information was used to make and sell, on a commercial scale, a substantially identical product.

Since it is generally illegal to make, use or sell patented items without the patent holder’s permission, items to be reverse engineered should be prescreened. The prescreening process should include a search of the relevant patent databases and a legal opinion as to whether or not

the intellectual property rights of others could be infringed.

UNLOCKING TRADE SECRETS

Trade secrets and confidential information are protected under the common law. Their characteristics include that they:

- are property rights;
- are not generally known to the public;
- give a business an opportunity or advantage over competitors; and
- have commercial value.⁷

Since the RE process may require the disassembly of an item to discover its inner workings, hidden features that the inventor meant to keep secret may be uncovered. Trade secrets have an indefinite life span. However, once uncovered by an examination of the product, they cease to exist, and the discoverer has the full right to exploit them.⁸ Therefore, in the absence of an expressed or implied duty of confidence, RE activities that honestly uncover or disclose a trade secret will not attract liability for breach of confidence.

Legal issues can arise when confidential information or trade secrets are shared. If the transfer of information takes place under a contract, the party providing the information usually insists that the party receiving it agree not to reverse engineer, disclose or use the information for purposes not covered by the contract. Failure to abide by these terms would be considered to be a breach of the contract.

In cases where there is no contract, the following conditions must exist for a breach of confidence:

- the information must be confidential;
- there must be some implied obligation of confidence between the parties providing and receiving the confidential information; and
- the confidential information must be used to the detriment of the party who provided it.⁹

Implied obligations of confidence arise in many business relationships, including those between partners, manufacturers and designers, consultants and contractors, licensors and licensees, and developers of technology and their manufacturers.¹⁰ To be considered confidential, information does not have to be identified as such. Generally, information with commercial or industrial value given on a business-like basis, and/or with some common objective in mind, will carry with it an obligation of confidence.¹¹ For example, the following situation might give rise to liability: An engineer provides a sample of an experimental chemical compound to a prospective manufacturer, and informs the manufacturer that it contains a secret additive. The prospective manufacturer then reverse engineers the compound, discovers the secret and exploits it commercially to the engineer's detriment.

To avoid liability, when prescreening items to be reverse engineered, engineers should ensure that the items have been lawfully obtained (e.g. purchased). They should also ensure that no expressed or implied duty of confidence exists that may be breached in the RE process, by reviewing contracts of sale and/or licenses.

THE GREY AREAS OF COPYRIGHT

Governed by the *Copyright Act*,¹² copyright gives authors of artistic, literary, dramatic or musical works the sole right to produce or reproduce their works in any material form, perform their works in public or publish their works.¹³ Copyright does not protect ideas, only the expression of ideas in a fixed form. Software is also protected under the *Copyright Act* as a literary work. Breach of copyright

occurs when the work is reproduced without the owner's authorization.

RE of a competitor's software is very common in the computer software industry. It can involve disassembly of the RE candidate into its source code, which is then incorporated into a new product. This often requires the creation of copies of the RE candidate, which are usually infringing acts. However, the *Copyright Act* provides for an exception to infringement called "fair dealing," where anyone may copy a work (in whole or in part) for the purposes of private study, research, criticism, review or news reporting without infringing copyright.¹⁴ In the United States, the same concept is called "fair use" although, there, it is somewhat broader.¹⁵ In some cases, RE of software may be considered fair use rather than infringement. As the following case attests, determining what is fair dealing or fair use is difficult and a question of degree.

TAKING IT TO COURT

U.S. court decisions are sometimes referred to in Canadian courts because of shared legal principles. In one U.S. case of interest to Canadian engineers, Sega Enterprises Ltd. sued Accolade Inc. for copyright infringement, after Accolade reverse engineered Sega's software without its permission. In that case, the court held that reverse engineering of Sega's software by Accolade to determine the functional concepts (i.e. ideas) for a new and competing product compatible with Sega's Genesis game players was fair use and not infringement.¹⁶

Like Canadian copyright law, U.S. copyright law does not protect functional concepts or ideas. Furthermore, Accolade did not produce a competing product that copied Sega's protected source code. The court's decision implies that in cases where RE is the only means to gain access to the functional concepts contained in the software, copying is justifiable provided that:

- copied material is not used for profit;
- only the portions of the copied program necessary to understand it are used; and

- RE is performed on only an authorized copy of the software.

The Sega case suggests that, in the U.S., RE of software is fair use as a matter of law in cases where it is the only way to gain access to ideas and functional aspects, and a legitimate reason exists for its use. The Sega decision is not Canadian law, but may be in the future. Nevertheless, before conducting a RE project, engineers should research the item to be reverse engineered to ensure that their RE activities will not infringe the intellectual property rights of others.

Gord Thomson, P.Eng., LLB, FEIC, is an intellectual property lawyer and currently enrolled in the Masters of Engineering Management program at the University of Ottawa. He may be reached at gord.thomson@sympatico.ca.

1. *Telerate Systems Inc. v. Marshal Caro* 689 F.Supp 221 at 232-233 (SDNY 1988) as cited in Barry Sookman, *Computer Law* (Toronto: Carswell, 1994) at 4.47.
2. Ingle, Katherine A. *Reverse Engineering* (New York: McGraw-Hill, Inc., 1994), p. 7.
3. Henderson, Gordon. "An Overview of Intellectual Property," in G. F. Henderson, Ed., *Trade Mark Law of Canada*, (Toronto: Carswell, 1993), pp. 2-3.
4. *Ibid.*
5. R.S.C. 1985, c. P-4
6. *Ibid.*, s. 44
7. Hughes, Roger and Woodley, John. *Hughes and Woodley on Patents*, (Toronto: Butterworths, 1998), p. 671.
8. Sookman, Barry. *Computer Law*, (Toronto: Carswell, 1995), at 4-44.1.
9. Note 7 at 671-2.
10. Note 8 at 4-12.
11. *Ibid.* at 4-15.
12. R.S.C. 1985 c. C-42 as amended.
13. *Ibid.* S.3.
14. *Ibid.* s. 29
15. Vaver, David. *Intellectual Property Law*, (Concord, Irwin Law), 1997 at 101
16. USPQ 2d 1561 (9th Cir. 1992) as discussed in Sookman, Note 8, at 3-225 et seq.



CSEM is please to announce its new board member from Toronto. Welcome Dominique. We appreciate your support.



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**Next issue will be published
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The Engineering Institute Of Canada
L'Institut canadien des ingénieurs

**B. John Plant, OMM, CD, NDC, FIEEE, FEIC P. Eng., Ph.D
new Executive Director of The Engineering Institute of Canada**

Ottawa, Ontario
June 30, 1999

The Engineering Institute of Canada announced today the appointment of B. John Plant as its new Executive Director. Dr Plant replaces Michael Bozozuk who retired after more than five years of service to the EIC. The National Council of EIC expresses deep appreciation to Mr. Bozozuk for the guidance and dedication he has provided the Institute. Mr Rollin says, "EIC is most fortunate that someone with his capabilities was available to direct the coordinating office during this period."

John Plant brings to EIC an impressive and diverse background of engineering, leadership and management experience. Dr. Plant served as Principal and Director of studies at the Royal Military College from 1984 until his retirement this month. He was instrumental in bringing together the Canadian Society for Electrical and Computer Engineering and Region 7 of IEEE to form IEEE Canada in 1993, now the largest member, society of the EIC. He served as EIC President from 1994-96, and was the key person during a pivotal time in the history of the Institute.

John Plant attended the Royal Military college of Canada, Kingston, Ontario and the Royal Naval Engineering College Plymouth, England. He received his Ph.D. in Electrical Engineering at the Massachusetts Institute of Technology, Cambridge Massachusetts. He is a retired naval captain decorated with the Queen Elizabeth Silver Jubilee Medal and the Order of Military Merit. As a professional engineer he has received the Professional Engineer Association of Ontario Citizenship Award, the IEEE Centennial and A.G.L. McNaughton medals and the EIC John B. Stirling Medal in 1998. Dr. Plant serves on the IACET Board of Directors and he was recently appointed its Treasurer.

Dr. Plant will be taking up his new duties effective July 15, 1999. He will maintain an office in both Kingston and Ottawa with a total commitment to EIC business equivalent to 2 to 3 days per week.

The Engineering Institute of Canada is Canada's oldest and largest technical engineering federation. Its technical societies work together for the benefit of all its members and the profession of engineering as a whole.

Leadership that counts

by Jim Ridler, P.Eng.

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Engineers are leaders, setting examples and making difficult decisions that affect the public, employers and our colleagues. Professional image and excellence depend on strong leadership

As professional engineers, we are all leaders, like it or not. We have to make difficult decisions, especially related to ethics. Those decisions will produce consequences for others, good and bad—more of the former we hope. The decisions we make will also provide the standards for others to follow. For both of these reasons, our leadership decisions must be based on ethical principles. What we're striving for is "principled leadership."

This approach will help us in our careers, as integrity and honour are primary assets. It will also help our profession to maintain its standards and image. And it will lay the foundation for professional excellence, moving beyond our minimum obligations (what we have to do) to strive for superior results (what we ought to do)—to "go the extra mile."

DO THE RIGHT THING

What makes a good leader? Leaders do the right thing. They accomplish this by turning principles into action. They exercise wisdom, by using information in the right way. Leaders inspire trust. They establish values that underpin all policies, practices and programs. They have the conscience, courage and conviction to ensure that their decisions reflect these values and reinforce trust.

In engineering, our leaders recognize our professional responsibilities and the corresponding high standards to which we all must aspire, such as advocacy for safety and environmental protection.

Leaders accept not only responsibility, but also personal accountability. This means they are bound to answer personally for performance of duty, as individual engineers and for their subordinates. Accountability has come to include the concept of "due diligence," which covers having the right process as well as the right results, like implementing a strong safety program as well as a good safety record.

GOOD RULES TO WORK BY

Principles are moral or ethical standards that define good behaviour. These principles are the tools by which leaders can know they are doing the right thing in the right way.

Engineers who work by these principles will build a strong practice, based on professional excellence. Principles underlie laws and societal values. Here are some examples:

- Show respect for individuals and their property.
- Help others.
- Do not cause harm to others.
- Provide equal opportunity.
- Conserve our environment.

While these principles guide leaders in general, engineers have a specific guide to follow: PEO's code of ethics. This is our "ought to" list. Here are the underlying principles of the code of ethics:

- Protect public welfare and the environment.
- Be fair and loyal.
- Follow high ideals.
- Be faithful and honourable.

- Avoid or disclose any conflict of interest.
- Expose unethical conduct.

Note the similarities between the two lists. The same principles behind laws and societal values also underpin the engineer's code of ethics. There are just differences of emphasis. The obvious example is that the engineer's duty to public welfare is paramount.

OPPORTUNITIES FOR LEADERSHIP

There are opportunities for professional engineers to go beyond our minimum professional obligations. A recent example is the extension of PEO's professional practice guideline to include environmental guidelines, and to interpret the engineer's duty to protect public safety and welfare to include our environment. An individual engineer might, for example, advocate environmental sustainability efforts in his or her organization.

Another opportunity for providing principled leadership could involve clarifying how PEO's ethics code and its underlying principles cover international engineering practice by Ontario engineers working outside of Canada. For example, should the profession endorse the Convention on Combating Bribery of Foreign Public Officials approved recently by the Organization of Economic Cooperation and Development (OECD)? This convention requires Canada and other OECD countries to pass legislation making it illegal to bribe foreign government officials or their agents.

(Continued on page 6)

THE CASE STUDY

Breaking his own office rules

Edith Earnest arrived at work to find the facilities manager, human resources manager and security manager in her office. Edith is the ethics advisor for a major engineering consulting firm with international operations. She is also an experienced engineer. Recently, the firm had initiated a no-smoking policy for its head office.

The reason for the uninvited guests soon became clear. Facilities staff had found cigarette butts in a secure area when they opened the head office. Further inspection found more butts in the office of Joe Jolly, the general manager and an engineer. Evidence of drinking was also found. Not only had smoking and drinking policy violations occurred, but there were concerns about either a security breach or abuse by cleaning staff.

A notice was posted giving a brief description of the incident, asking employees for any related information and reminding them about the company's policies about smoking and drinking in the

office. Since there was still no response, electronic records of office access were examined. These cleared the cleaning staff, but showed that Joe Jolly had been at the office at a late hour, used his phone and then left. Joe was a smoker.

With this information, Edith and the security manager approached Joe's secretary. Having heard the latest, she acknowledged with great reluctance that Joe had been out of town, but had flown back last night. She also admitted that, under the circumstances, prior experience made it conceivable that the policy-breaker was Joe.

After much discussion, Edith and the security manager decided they had the evidence required to bring up the issue with Joe at the first opportunity. After hearing them out, Joe sheepishly acknowledged that he had had too much to drink on the flight home, come to his office briefly, smoked, made a phone call and gone home. He also apologized for breaking his own office rules and all the trouble he had caused.

Edith and the security manager decided that the issue had been resolved, and that the matter should remain confidential. There was no repeat occurrence. In fact, the incident and its handling appeared to have a salutary effect on the general manager's drinking as well. Joe was later promoted to president.

LESSONS LEARNED

Joe Jolly had a failure in principled leadership. He disobeyed his own policies, then tried to hide it. Edith and the security manager provided principled leadership, through their responsible and supportive actions and by being fair and compassionate in doing their jobs.

The bottom line is that ethics will not just happen by itself. Sound leadership is needed to define the desired ethical standards and then to institutionalize them throughout the organization. This can't be outsourced. Leaders have to take responsibility, address ethical issues and turn principles into action. That is what principled leadership is all about.

(Continued from page 5)

There is also a new, voluntary International Code of Ethics for Canadian Business, which could be supported by the profession.

The profession could also provide more support and encouragement for aspiring to excellence in the teaching of engineering ethics in university engineering faculties. What better way to instill principles in the future leaders of our profession?—

Jim Ridler, P.Eng., is principal of James G. Ridler and Associates in Lansdowne, Ontario, and director of the Canadian Centre for Ethics and Corporate Policy. He coordinates the professional practice and ethics course for the Professional Development Centre (Engineering) at the University of Toronto and teaches business ethics at Queen's University.

Canadian Environmental Auditing Association – 1999 National Conference

The 1999 CEAA National Conference and Annual General Meeting will be held on November 1 and 2 at the Toronto Colony Hotel. The theme of the conference is "Environmental Auditing – Beyond ISO 14000".

Major topics that will be featured include:

- Verification Auditing – Emerging Issues
- Assessing Risks as a part of Auditing
- Maximizing Certification Opportunities
- Harmonization of ISO 9000 and ISO 14000 International Standards
- International Perspectives – Emerging Issues

In addition, two workshop sessions will be available on October 31. The workshop sessions are entitled:

- Environmental, Health and Safety Management Information Systems
- ISO Gap Analysis

For further information please contact Amber Ellis at (905) 567-4705 or access the CEAA web site at www.ceaa-acve.ca

1999 PEO STUDENT PAPERS NIGHT



CSEM Ottawa Chapter was a sponsor of the 1999 PEO Student Papers Night held on April 7, 1999. CSEM Ottawa Chapter Chair, Gord Thomson, acted as a (very unqualified) judge. Four presentations were given: 2 from Carleton and 2 from U of Ottawa. Happy winners are from U on O.



CBMES JOINS THE EIC

L to R: André Rollin, President EIC, Mike Bozozuk, John Seychuck, Petr Kresta, John Plant, Norm Jeffrey, President CSME. (see back page)



MY POINT: ENGINEERS CAN DO ANYTHING!!

February 1999 – Gord Thomson spoke to Queens' engineering students about engineers in law and engineering careers in general at Cirque '99. CSEM gave \$200 in support. CSEM will try to participate annually in this worthy event.

1999 EIC AWARDS BANQUET

The 1999 EIC Awards Banquet was held on March 1, 1999 at the National Arts Centre.

The 1999 senior award recipients were:

SIR JOHN KENNEDY MEDAL

Awarded in recognition for outstanding service to the engineering profession

J. James Kinley
Lunenburg, Nova Scotia

JULIAN C. SMITH MEDAL

Awarded for achievement in the development of Canada

Jack D. Mollard
Regina, Saskatchewan

Archibald N. Sherbourne
Waterloo, Ontario

THE K.Y. LO MEDAL

Awarded in recognition of significant engineering contributions at the international level

Suzanne Lacasse
Oslo, Norway

JOHN B. STIRLING MEDAL

Awarded in recognition of leadership and service to the Institute and its member societies at the national level

Robert J. Mitchell
Kingston, Ontario

HONORARY MEMBER

Awarded to a non-member of the Institute for outstanding distinction and service to the engineering profession

Paula Giannelia
Calgary, Alberta



CSEM Director Gord Thomson receives his EIC fellowship from André Rollin



Senior Award Recipients



Fellowship recipients

Annually, the Engineering Institute of Canada elects a number of engineers to the grade of Fellow for their exceptional contributions to engineering in Canada. The 1999 Fellows are:

P. Daniel Burns	Calgary, Alberta
Alv O. Dyregrov	Winnipeg, Manitoba
Thomas Field	Vancouver, British Columbia
W.D. Liam Finn	Vancouver, British Columbia
Mel U. Hosain	Saskatoon, Saskatchewan
Michael C. Ircha	Fredericton, New Brunswick
Michael Isaacson	Vancouver, British Columbia
Wallas H. Khella	Mississauga, Ontario
Chandra M. Kudsia	Cambridge, Ontario
Peter B. Leach	Almonte, Ontario
Serge Leoueil	Québec, Québec
Ivan P. Lieszkowszky	Unionville, Ontario
Vijay K. Sood	Brossard, Québec
Victor A. Sowa	Delta, British Columbia
Gordon Thomson	Orléans, Ontario



The Canadian Medical and Biological Engineering Society, Inc. (CMBES) Joins The Engineering Institute of Canada (EIC)

André L. Rollin, President of EIC, and Dennis F. Lovely, President of CMBES, are pleased to announce that CMBES has become the newest technical engineering society of the EIC. The official signing took place March 1, 1999 at the National Congress Centre in Ottawa during the First National Forum on Engineering and Continuing Education organized by the Canadian Council of Professional Engineers. Approximately 100 engineers from all across Canada witnessed the historic event.

In applying for membership in the EIC on January 27, 1999, Dennis Lovely wrote:

"On behalf of the Executive of the Canadian Medical and Biological Engineering Society, this letter confirms our aim to apply for membership in The Engineering Institute of Canada. We would like to take an active role in the Technical Professional Development Committee, which would benefit all our members."

CMBES joins the other members of the EIC, namely:

- Canadian Geotechnical Society (CGS)
- The Canadian Society for Civil Engineering (CSCE)
- Canadian Society for Chemical Engineering (CSChE)
- The Canadian Society for Engineering Management (CSEM)
- The Canadian Society for Mechanical Engineering (CSME)
- IEEE Canada (The Institute of Electrical and Electronics Engineers, Inc.)

This new addition will strengthen the EIC and help us to realize our vision which is to become the leading proponent of continuing education and technical professional development in the Canadian engineering profession.

For additional information, please contact The Engineering Institute of Canada at (613)742-5185 or E-mail at info@eic-ici.ca or visit our website at: www.eic-ici.ca

Canadian Society for Engineering Management



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