New water regulation requires P.Engs' reports

First reports due before May 2001

by Dwight Hamilton

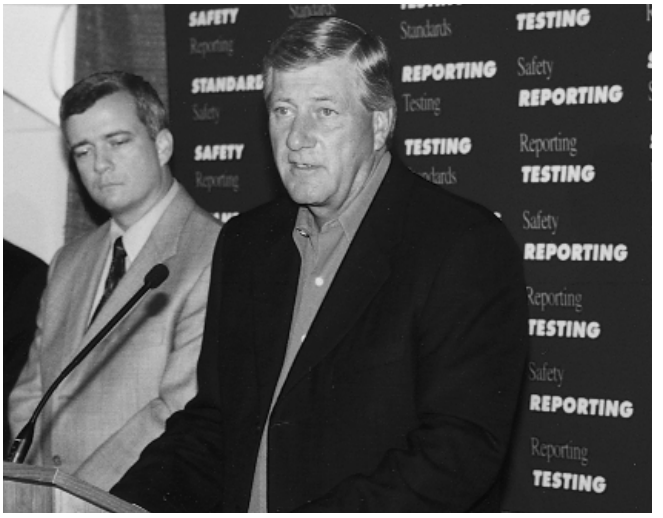
In the wake of the Walkerton tragedy, in which E. Coli bacteria from drinking water caused six deaths and sickened as many as 2000 people, the Ontario government has announced a new drinking water regulation requiring a professional engineer's report every three years for all municipal water works. The Drinking Water Protection Regulation puts into law the Ontario Drinking Water Standards, which were updated and toughened to reflect the most current procedures and expertise.

"I'm confident this will be the toughest [legislation] we will be able to see, if not in all of North America, then in all of Canada," said Premier Mike Harris at a Queen's Park press conference. Flanked by Environment Minister Dan Newman and Municipal Affairs Minister Tony Clement, he pledged that "once in place, this will do the job."

PEO president Peter DeVita, P.Eng., says the new regulation will help restore public confidence in Ontario's drinking water, and that involving engineers in reviewing municipal water systems will help prevent another tragedy like Walkerton from occurring. "The people of Ontario can be sure that, in any instance where a professional engineer finds the water purification systems to be inadequate, that engineer will immediately notify all proper authorities," he said in a statement of PEO's support for the new regulation, which took effect August 26. "We're ready to do all we can to ensure it never happens again."

The regulation's announcement follows a May letter from DeVita to the Premier's office, offering PEO's assistance in resolving the crisis. After receiving it, staff from the Ministry of the Environment (MOE) contacted PEO for help in developing appropriate terms of reference for the professional engineers' reports. As stipulated by the regulation, the reports will include: a description of the works, an assessment for contamination, a compilation of Certificates of Approval for all works in the municipality, characterization of the raw water supply source, an assessment of operational procedures and recommendations, an assessment of physical works and recommendations, and recommendations for a monitoring regime to ensure compliance with the Ontario Water Resources Act and the Ontario Drinking Water Regulation.

The reports must be prepared by an engineer who has experience in sanitary engineering related to drinking water supplies and who is not an employee of the owner. Because the design of waterworks is specialized, even municipalities with large engineering staffs often engage consulting engineers for this type of work.



Ontario Premier Mike Harris (right) and Minister of the Environment Dan Newman announce the new Drinking Water Protection Regulation, part of the Ontario Water Resources Act, at a Queen's Park press conference August 8.

The first report on each waterworks must be submitted to the MOE between November 2000 and May 2001 (technical briefs explaining the regulation in detail and a submission schedule for initial engineers' reports are available at www.ene.gov.on.ca). Based on its review of the reports, the ministry will issue consolidated Certificates of Approval outlining new terms and conditions for each waterworks. Waterworks owners may be required to upgrade their facilities based on the initial engineering reports. Subsequent reports will be due every three years.

Inquiry standing requested

PEO has also been granted standing for the second stage of the Walkerton Inquiry, set up by the Ontario government under the Public Inquires Act (www.walkertoninquiry.com). While the initial stage will focus on what went wrong in Walkerton, the inquiry's second stage will examine issues concerning the future safety of the province's drinking water. PEO's request for standing was granted because of the association's "vast experience of standard setting and regulation of engineers," said Justice Dennis O'Conner in his ruling. The complete text of PEO's presentation to support its application for standing can be found at www.peo.on.ca. (click on "What's new on the site" to find it).

As a prelude to Part II of the inquiry, an expert panel will oversee preparation of several discussion papers, which will outline the current state-of the-art in engineering, science and management. Standing at the inquiry permits PEO to comment on these papers, prepare a submission of its own if necessary, and ask questions during the Part II public hearings.

Engineers key to restoring confidence in Ontario's drinking water: environment minister

In an interview with *Engineering Dimensions* associate editor Dwight Hamilton, Ontario's Minister of the Environment Dan Newman explains the implications of the new Drinking Water Protection Regulation, which took effect August 26. (See "New water regulation requires P.Engs' reports," on p. 11).

Environment Minister Dan Newman

ED: *How do you feel this regulation will improve assurance in drinking water safety for the people of Ontario?*
Newman: What it does is clearly identify who must contact whom in the event that there are unsafe water samples taken. It clearly spells out that the lab that does the testing must inform the MOE (environment ministry), the medical officer of health, as well as the owner of the waterworks. Then there's a second set of calls that have to be made by the owner back to the medical officer and the MOE. So it's a double check that's in place.

ED: *And this previously wasn't in place?*
Newman: Right. We had the drinking water objectives, and now we have standards. And it wasn't simply a matter of taking the objectives and turning them into standards. We did that as a starting point and then added additional health-related parameters.

ED: *What about the professional engineers' reports that are now required?*
Newman: They'll be starting shortly. Every one of the 630 waterworks in our province will be done over a six-month period. This sends a strong message that we take this very seriously.

ED: *The professional engineers' reports are to include an assessment of physical works and recommendations, and recommendations for a monitoring regime to ensure compliance with the Ontario Water Resources Act and the Ontario Drinking Water Regulation. Do you think engineers have enough clout to make these recommendations?*
Newman: Absolutely. And you can't look at it [the reporting process] in isolation: The fact that we are inspecting waterworks on an annual basis, plus the increased parameters that we're testing for, these three things together provide proper assurance.

ED: *Are the annual inspections separate from the professional engineers' reports?*
Newman: Yes. In June, I indicated that every one of the municipal works would be inspected. We're now about half way through. The public will now have access to current test results and to the Certificates of Approval for municipal works.

ED: *What else can professional engineers do to build confidence in Ontario's drinking water?*
Newman: Because it's a new regulation, there's a learning process that has to take place. We're working with municipal and ministry staff to ensure that everyone knows what their roles and responsibilities are. Engineers play a role, whether they work for the ministry, the municipality or the public utilities commission. I think engineers will have a key role, not only in educating people about this, but also in actually seeing that the regulation is implemented properly.

Software engineering report comes under fire

by Dwight Hamilton

An independent panel established a year ago to make non-binding recommendations on the use of the term "software engineering" in the undergraduate university community has released its final report, and its proposed solutions are generating controversy.

The panel was formed in September 1999, as part of an agreement reached between the Canadian Council of Professional Engineers (CCPE), Memorial University of Newfoundland and the Association of Universities and Colleges of Canada. The agreement ended CCPE's lawsuit against Memorial over its use of the word "engineering" in the name of a computer science program.

The panel's key recommendation is that a new, joint accreditation board be formed to accredit software engineering programs, since it's neither "feasible nor advisable to accord either computer scientists or professional engineers exclusive control over [the field's] future development." The joint accreditation board would comprise representatives of the Canadian Engineering Accreditation Board (CEAB), the Computer Science Accreditation Council (CSAC) of the Canadian Information Processing Society (CIPS), and industry- and university-based members. Any software engineering program the board accredits would qualify its graduates academically to pursue either a P.Eng. licence or the I.S.P. (Information Systems Professional) designation granted by CIPS.

Under this arrangement, accredited software engineering programs could exist either within or outside of engineering faculties. CEAB would continue to independently accredit other programs in the software area, as long as the word "engineering" is included in the title (e.g. computer engineering). CSAC would independently accredit other programs in the software area, as long as the word "engineering" is absent from the name (e.g. computer science, software architecture, software design).

The report states that the joint accreditation board would enable the engineering profession to "exercise a strong influence on all software engineering programs proposed for accreditation, thus enabling the profession to fulfil its responsibilities for public safety and for ensuring the integrity of the terms 'engineer' and 'engineering.'" The benefits for CIPS would include a steady supply of software engineering graduates, who have been exposed

Continued on p.14

to a standard body of knowledge considered essential for software engineers.

The report stresses that universities should retain autonomy over "designing and placing" undergraduate programs, and be "at liberty to decide the most appropriate approach to providing software engineering programs" based on their own resources. But it recommends that universities use the term "software engineering" only for programs of study accredited by, or intended for accreditation by, the joint board.

To develop its report and recommendations, the software engineering panel considered submissions from several organizations, including CCPE and CIPS, and examined current practices in Canadian universities related to the administration of software engineering programs.

However, David Parnas, PhD, P.Eng., director of McMaster University's software engineering program, and a member of the Software Engineering Advisory Group formed by CCPE to develop the profession's position on the issue and advise it on the panel's recommendations, feels the report is based on some false assumptions. For example, he says, the I.S.P. designation and P.Eng. licence are not comparable, because the I.S.P. designation requires only a few courses, does not specify content or a core body of knowledge, and is voluntary. As well, CSAC accreditation criteria are "quite vague" and do not specify a core body of knowledge, while CEAB accreditation criteria are "fairly detailed and demanding," he says. He cautions that, if CEAB gives up its right to accredit software engineering programs, and a new body with a focus on "flexibility" takes over, standards could be weakened.

For its part, PEO's Executive Committee has expressed concern over the "direction and lack of clarity" of the report's proposed plan, and said it is not prepared to support a solution that lowers the standards in engineering. It has requested that CCPE not conclude any agreement without substantial discussion with, and the concurrence of, its members.

CIPS, meanwhile, is taking the position that software engineering education should be available in both computer science and engineering departments at Canadian universities, to help meet the high demand for software engineering practitioners. Mary Jeane Kucerak, executive director of CIPS, says she's pleased with the panel's central recommendation, and doesn't see a risk of standards being lowered in engineering, since CEAB and CSAC have formed a joint task force to examine the feasibility of establishing an accreditation process that would meet the standards of both organizations.

CCPE's board of directors discussed the panel's recommendations at a meeting earlier this month, as well as the findings of the advisory group and the joint CEAB/CSAC task force. CCPE's board will make no decision on the panel's recommendations until its November meeting, to provide more time for discussion.

See the October/November issue of *The Link* for further coverage.

Online professional development registry goes live

by Susanne Frame

Engineers can now keep track of their professional development hours through a new online registry.

The Engineering Institute of Canada's (EIC) professional development registry is an online database that enables engineers to record courses and training they take related to their professional practice. Previously, the EIC offered a service in which its partners (technical societies, universities, colleges and private trainers) registered information on participating engineers' learning activities. The new service expands the EIC's registry to enable individual engineers to maintain their own professional development records.

All Canadian professional engineering associations encourage their members to record these activities, and some, including those in Alberta and PEI, require members to report them periodically. Maintaining records of continued professional development is also becoming a factor in competition for international contracts.

"The registry is a free benefit to individuals in the profession," says John Plant, P.Eng., executive director of EIC. "We'd like engineers to use the site on a regular basis."

The EIC registry will maintain records of engineers'continuing education units (CEUs) and professional development hours (PDHs). A record of these hours will be available for seven years. Individuals can download their own record, or for a small fee, EIC will supply transcripts and certificates of participation upon request.

To ensure privacy among users, EIC assigns them a user name and password, and records cannot be accessed without the password.

Drawing from universities and institutes from across Canada, engineers can broaden their knowledge through formal courses, workshops, conferences, seminars, technical lectures, site visits, preparation of technical publications and other self-study learning activities.

Professional development hours can be achieved in several ways, since they include a wide range of activities where the application of knowledge is not assessed. Examples include technical conferences, seminars, and lectures.

CEUs must satisfy the requirements of the International Association of Continuing Education and Training (IACET.) Ten hours of continuing education activity equal one CEU. Examples include courses and workshops.

EIC plans to set up a help desk for users of the registry. For more information on professional development, visit www.eic-ici.ca. To register in the new service, go to www.eic-ici.ca/english/pda.

C of A Review Task Group has broad mandate

by Connie Mucklestone

PEO's new Certificate of Authorization Review Task Group has begun developing a work plan for its comprehensive review of the Certificate of Authorization (C of A) program. Terms of reference for, and membership of, the task group were approved by PEO Council on June 30, 2000.

Chaired by Councillor Gina Cody, P.Eng., who also heads the Professional Practice Committee (PPC), the task group will undertake a broad review of the C of A program, with the aim of recommending the best approach to corporate licensing of engineering firms in the context of PEO's mandate to regulate the practice of professional engineering in the public interest.

Other members of the task group are Norbert Becker, P.Eng., Richard Braddock, P.Eng., John Clayton, P.Eng., Roy Fletcher, P.Eng., Bob Goodings, P.Eng., Don Ingram, P.Eng., Gordon Kack, P.Eng., Max Perera, P.Eng., and Chris Roney, P.Eng. Members of the task group have been chosen to ensure representation from the PPC, Consulting Engineer Designation Committee, Consulting Engineers of Ontario, PEO Council, and current C of A holders and designated Consulting Engineers. The task group hopes to add members that will bring the perspectives of employee engineers and emerging disciplines.

To meet its mandate, the task group will examine why the C of A program was established and whether the program is the best mechanism for meeting the original objectives. Some questions it will consider include:

- Does an additional licence for those offering or providing engineering services directly to the public afford additional public protection?
- Does the C of A confer any accountability on the engineering firm for the services provided, or does accountability rest with the individual professional engineers employed by the firm?
- Does the current C of A program correctly address the impact of business entities on the practice of engineering?
- Is most professional engineering activity in society delivered by C of A holders?
- What are the implications for the Consulting Engineer designation and for the Professional Excellence Program of any proposed changes to the C of A program?
- Will existing legislation have an effect on attempts to change the C of A program?

The task group will hold monthly meetings open to anyone interested. Watch for updates on progress of the review in future issues of *Engineering Dimensions*, and on PEO's website (www.peo.on.ca).

Your input is needed!

The C of A Review Task Group is soliciting written comments from members and others on the issues covered by the above questions or on any matter pertaining to the C of A program. Please direct your comments to:

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Background chronology

- **October 1998**–PEO Executive Committee directs that the Professional Practice Committee (PPC) strike a subgroup to explore the need for and possible scope of a review of the C of A program.
- **December 1999**–Following an extensive review of the subgroup's findings, the PPC recommends that a separate and newly constituted task group with a broader membership undertake an in-depth review of the C of A program.
- **February 2000**–PEO Council approves formation of a C of A Review Task Group.
- **June 2000**–Council approves terms of reference and membership of the C of A Review Task Group.
- **August 2000**–C of A Review Task Group holds inaugural meeting.

Growth industries revolutionizing engineering, study finds

by Dwight Hamilton

Explosive growth in the biotechnology, software development and information technology (IT) industries will affect the engineering profession's composition, with the highest growth expected in the electronic and electrical specializations.

This is according to a study commissioned by the Canadian Engineering Resources Board (CERB), a standing committee of the Canadian Council of Professional Engineers (CCPE), which was based on interviews with human resources directors and engineering managers at 93 companies in the three sectors.

It also found that trends in specialization could mean engineering graduates will be less likely to become licensed, and those who do will have different expectations of their associations. About 30-40 per cent of the firms interviewed said they support professional associations for promoting ethics and professional standards. But, just 25-30 per cent support belonging to an association that is not technology-orientated, such as PEO. None of the companies interviewed said they would make membership in a professional association or licensing mandatory for employees.

Where's the work?

Generally, the line between the work that engineers and technologists do is blurred in these industries, the study found. But in some firms, the distinction is sharp, with engineers handling design and project management.

Although biotech currently uses few engineers, demand for engineers in the industry is expected to increase dramatically over the next 10 years, as more companies move from research and development into commercialization. And while the term "engineer" pops up often in software development, the sector insists on an engineering degree only in systems integration.

The study found that IT hires the most engineers. In manufacturing, they do the design work, while testing, production, trouble-shooting and customer relations are handled by technologists.

Skill sets

Within the three industries, the multidisciplinary team is the main model of organization, and firms value non-technical skills that can make them more productive. Skills in demand include good writing and communication abilities, being able to work well in a group and having an understanding of business. Companies in these sectors also place a high value on leadership, since virtually all of the engineering work they do involves project management.

Things to consider

The study report also recommends strategies for managing these issues, including that provincial associations strengthen working relationships with the three industries. Norman Williams, PhD, P.Eng., PEO deputy registrar, admissions, feels this is a good idea. "There's an overriding need for us to communicate the value of the P.Eng. licence to industry, with an emphasis on the importance of having engineering work overseen by licensed professional engineers," he says.

The study report also recommends that CCPE and provincial engineering associations consider a major upgrading of engineering-internship-training (EIT) programs, including adding training or demonstrated experience in quality control theory and project management to licensing requirements. Although this is implicit in current experience requirements for licensing, David Lapp, P.Eng., CCPE director, professional affairs, generally agrees with the recommendation, saying that signals from these industries show that there should be "more structure" in the EIT program.

The report also recommends that the CERB consider incorporating professional standards requirements into quality standards, such as ISO standards or the regulations of the federal Health Protection Branch. "It's a question of getting engaged with those bodies to add our perspective, so the principles of our profession can be reflected in those standards," says Lapp.