

Engineering program accreditation to proceed at Memorial University

by Karen Hawthorne

The process to accredit the four engineering programs offered in the faculty of engineering at the Memorial University of Newfoundland will resume, putting 1000 engineering students in the programs at ease.

In a move to force the university to stop using the label “software engineering” for a computer science program, the Association of Professional Engineers and Geoscientists of Newfoundland (APEGN) pulled its consent in February for the Canadian Engineering Accreditation Board (CEAB) to complete accreditation evaluations on Memorial’s engineering programs. Memorial then took legal action against APEGN to have the decision reversed. A recent decision handed down by Newfoundland’s Supreme Court determined that APEGN cannot arbitrarily stop the accreditation process, saying it has a duty under the province’s Engineers and Geoscientists Act to respond to requests to examine programs in order to determine whether they meet the academic standards required for accreditation.

APEGN is reviewing the court decision with legal counsel and hopes to appeal, because the ruling “may have serious implications for the engineering profession,” says

Gerry Suek, P.Eng., the association’s president.

Allen Steeves, P.Eng., APEGN’s executive director, says the court decision gives “the green light” to institutions across the country to offer ill-named engineering programs that do not meet CEAB standards. “We’re looking at the erosion of the meaning of an engineering degree because we (provincial associations) aren’t allowed to enforce it,” Steeves says.

Memorial University president Arthur May welcomes the court decision. “We took court action to protect our engineering students and the programs offered in our faculty of engineering,” he says. “Our students should never have been subjected to this, especially considering that APEGN fully acknowledged that the engineering programs at Memorial University are among the finest in the country.”

This turn of events follows a lengthy legal battle. Two years ago, APEGN and the Canadian Council of Professional Engineers (CCPE) sued Memorial for infringing on CCPE’s trademark on the engineering title. CCPE contends it has exclusive rights to the word “engineer”—a controversy echoed across the country, as provincial associations grapple with regulating graduates from engineering programs in emerging fields. The lawsuit against Memorial is scheduled to go to trial in a federal court in September.

“It was clear that the tactic of withdrawing consent was not successful in pressuring Memorial to resume discussions,” says Ray Gosine, P.Eng., an engineering professor at Memorial. “My own position is that this matter should have been dealt with by Memorial University and should never have become the spectacle that it has become.”

Provincial associations have a statutory obligation to assess engineering degree programs and to establish standards, Gosine says, adding that he has not raised the topic for discussion in the classroom. Student

representatives from Memorial’s Engineering Student Association could not be reached by *Engineering Dimensions* for comment.

“I would argue that the process works extremely well in favour of the participating universities, and that the public is well-served by the process,” Gosine says.

PEO Council supports APEGN in its efforts to protect the integrity of the engineering title. The potential fallout from a Memorial victory could set a precedent permitting universities legally to offer “engineering” programs that are not reviewed and accredited by the CEAB. PEO believes graduates of such programs will inevitably call themselves “engineers,” with the result that the public will be unable to distinguish whether those designing safety-critical systems are licensed professionals accountable to a regulatory body for the impact of their work on public health, safety and welfare.

PEO has requested a meeting with representatives of the office of the Attorney General and Ministry of Education and Training to discuss its concerns over misuse of the word “engineering” in the names of software specialties at the universities of Toronto and Western Ontario. The association has also met with the president of the University of Toronto. Other activities are aimed at defining engineering practice in software design, increasing public awareness of misuse of engineering titles and more rigorously enforcing the title provisions of the Professional Engineers Act.

Gosine says the challenge for the engineering profession is to develop registration mechanisms that recognize an appropriate range of software professionals from both the engineering and computer science fields: “In many cases, emerging fields of practice are well established research areas in universities. I think that professional associations and universities should be partners, not adversaries, in dealing with such fields.”

Correction

The election candidate statement for Miroslaw A. Slonski, P.Eng., published in the January/February 1999 issue of *Engineering Dimensions* (p. 47), contained two errors. Mr. Slonski graduated with a BAsC in aerospace engineering from the University of Toronto in 1988, rather than in 1998 as indicated. In addition, his Engineers for Engineers (EFE) endorsement statement was omitted. We apologize for any confusion the errors may have caused.

Y2K countdown—Engineers report on final preparations

by Karen Hawthorne

Dave Honkanen, P.Eng., will be on a plane to London, England, when the clock ticks over into the morning hours of January 1, 2000. That's the best assurance he can give to wary airline customers, he says, considering he oversees Y2K efforts for Nav Canada, the non-profit organization responsible for air traffic control systems across the country.

"I wouldn't be flying if it wasn't safe," Honkanen says from his test lab in Ottawa. "That's probably the only way to convince people."

The possible crash of computer systems in everything from airport control towers to household appliances has prompted Y2K paranoia at large. Behind the scenes, engineers and other professionals are hard at work to ensure all systems are ready for the momentous date change. Many computer programs that are encoded with a two-digit year will fail to recognize the next century and misread the year 2000 as 1900.

At Nav Canada, Honkanen launched a comprehensive process last year to assess, renovate, validate and certify all its operational and "mission-critical" systems like radar and communications air traffic controllers use to monitor planes onscreen and direct pilots. "We had a million and a half lines of code to scan and analyze," he says of the complex navigation systems.

Honkanen and his team created a sophisticated lab site that duplicates "real-world" systems at seven air traffic control centres and 40 major air traffic control towers across Canada. In the lab setting, his team was able to simulate possible problems that could arise from a Y2K system failure, identify them and make any necessary changes.

The team combined several courses of action to do this, including replacing the system entirely and developing a new one, expanding the year field to four digits, and encoding century information in a six-digit space. Systems were put to a real-world test in Vancouver this March: Dates were rolled forward to January 1, and systems were run for a week to Nav Canada's satisfaction.

Other concerns remain because of international aircraft flying in airspace controlled by Canada. "We control half of the north Atlantic—that's a vast domestic airspace,"



As the year 2000 draws nearer, engineers are taking action to prevent Y2K-related computer system failures, including testing and replacing systems, liaising with suppliers to ensure Y2K compliance and educating clients.

Honkanen points out, adding that international navigational systems must be compatible for safe travel. Joint tests with controllers in the United States, Britain, Portugal and Iceland are currently underway.

Looking after public transit

People who want to stay grounded this New Year's Eve can be assured that buses in the Hamilton area will be running as usual, says Peter MacNeil, P.Eng., who heads up information technology services for the Regional Municipality of Hamilton-Wentworth. His team handles radio communications used for tracking the location of buses in the transit fleet and software development for transit projects, such as scheduling and fleet management systems.

"The Y2K hype is overblown in North America," MacNeil says. "I expect problems in billing and reporting systems, but the sun will still come up on January 1, 2000."

His department's troubleshooting identified "mainly custom software, which couldn't handle a four-digit date, or identified 12/xx/99 as the end of its life, or messed up on the leap year determination," he explains. The software applications in question were vehicle location tracking and BusCheck, the automated telephone system for passengers that provides information

on scheduled arrival times.

MacNeil reports all systems are ready for Y2K following a complete inventory, verification of Y2K compliance of hardware and software with vendors, review and corrections of code in software applications, and full testing with a date rollover.

As for Y2K contingency plans, manual backups will include all of the things that would normally be done if the computer system were unavailable for an extended period of time, like manual record keeping and work orders in the repair shop, and additional information clerks to answer customer calls if BusCheck were down, MacNeil says.

Testing the power grid

Concerns over loss of power have people shopping for wood stoves and generators, but David Wills, P.Eng., of North Bay Hydro is confident all systems serving the city are fully reliable. "We're responsible for the distribution systems," Wills says of his office. "The polls, wires and transformers (of the distribution systems) are not date-dependent in any way."

Wills says that it's the commercial side of electricity supply-billing systems and electronic metering systems that monitor power consumption of individual homes—that required sophisticated upgrades.

continued on page 12

Homes serviced on Toronto's power grid were tested earlier this year to much success, after a rigorous inventory, analysis and planning carried out by a designated Ontario Power Generation (formerly Ontario Hydro) project team. For more information, see "Ontario Hydro ahead of Y2K game," Letters, *Engineering Dimensions*, March/April 1999 issue, pp. 8-9.

Preventing glitches in communications systems

As a Y2K consultant in Ottawa, Pat Godin, P.Eng., calls herself a "hired gun" for a number of clients. A typical scenario for her work starts with building a lab that closely resembles the client's "production envi-

ronment." Care is taken to configure the equipment using the same hardware level and the same software version. Staff who work in the production environment are consulted, so that it's clear how the equipment is used and what functions are critical.

Then infrastructure components are tested—everything from the switches and routers to more complex applications residing on servers—followed by critical functions and other operations testing. The lab also serves as a test bed for the client's major production applications, says Godin.

"With regard to the Y2K bug in general, I have no intention of taking my family to an isolated cottage," Godin says. "As

a lesson from last year's ice storm, we now have alternative sources of heat in the house, lots of candles, spare batteries, some food and water stored. I believe that is called good planning—at any time."

Keeping the telecom network online

You should be safe using your credit card in 2000, thanks to the technical expertise of Ray Linseman, P.Eng. He is the technical support representative for Brock Telecom, a Brockville subsidiary of Nortel Networks. Nortel develops network systems for businesses that provide telecommunications and Internet services.

Many systems have been upgraded or replaced, says Linseman, who provides technical support for the production line and development of test facilities for business telephone sets. The sets are used by businesses that provide services from a telephone-operated central office.

Most of the PC-based test sets in his area have BIOS (Basic Input Output Systems) that are date-encoded from the 1993 time frame. "If powered down at midnight December 31, 1999, they will have a date rollover to January 4, 1980," he says of problems spotted by a special Y2K team. Most BIOS-run PCs that were found not to be compliant were replaced because of the high cost of upgrading them.

"A conscious decision was made not to replace some PC controllers," Linseman notes. "For the BIOS problem, we can either leave the PC powered on for the new year shutdown period, or manually change the date when first powered up in the new year. The next problem date will be 100 years in the future, and the test facilities will be obsolete before then."

On the software side, data files are created each day at Brock Telecom for which the filename reflects the date to which the data applies. Again, Linseman explains, date-sensitive software posed a problem, so the software was changed to use a new format with a four-digit year and the related yield processing routines were changed to be compatible.

From a personal viewpoint, he says his greatest fear relates to problems "that could be created artificially as a result of the hype. I think the biggest impact area is the stock market. I would like to see the stock markets closed for a reasonable period before and after December 31 to keep panic selling to a minimum."

Pacemaker tops list of Canadian engineering achievements

The pacemaker, Canadarm, Confederation Bridge linking Prince Edward Island to New Brunswick, IMAX theatre system and the transcontinental railway were celebrated as the top five Canadian engineering achievements of the 20th century during

neering as a profession is one of the best investments we can make for Canada's future," she said at the launch.

The five engineering achievements were selected by NEW's executive committee, which comprised representatives of the

Canadian Council of Professional Engineers (CCPE), the Canadian Academy of Engineering, the Engineering Institute of Canada and the Association of Consulting Engineers of Canada. Achievements were judged on key criteria: conception, design and execution by Canadian engineers, and demonstration of ingenuity, scope and diversity.

The achievements were ranked in a public opinion poll conducted by the Angus Reid Group. In a February survey of 1500 Canadians, 49 per cent chose the pacemaker over the other four achievements as the engineering

feat that makes Canadians most proud. The pacemaker was developed by John Hopps, P.Eng., and his team at the National Research Council in 1950. The lifesaving device, which launched Hopps' biomedical career, has helped millions lead normal, healthy lives.

Susanne Frame



Micheline Bouchard, ing., honorary chair, NEW '99, congratulates Donald Hopps on the lifesaving work of his father, John Hopps, P.Eng., who invented the pacemaker. The device was unveiled as the top Canadian engineering achievement of the century during NEW celebrations in Ottawa.

National Engineering Week (NEW) 1999, which ran February 27 to March 7.

NEW's launch in Ottawa kicked off with the unveiling of the top five list and presentations to the inventors by Micheline Bouchard, ing., honorary chair of NEW 1999 and CEO of Motorola Canada Ltd. "Generating our students' interest in engi-