



How does the P.Eng. stack up?

An international perspective

by Alison Piper

Today, the issue of international practice is high on the agenda. Global dialogue among engineers has never been greater, and building relationships with engineers in other countries has never been more important. So, it helps to understand how the profession is regulated in other jurisdictions.

Just how unique is a Canadian professional engineer or P.Eng.? The education and training of engineers and regulatory requirements vary widely, depending on where you live. Here's a comparison of professional standards in Canada, the United States, Mexico, the United Kingdom and Europe.

The makings of a P.Eng.

Let's use the Canadian situation as a benchmark for other countries. In brief, to obtain a P.Eng. licence, applicants educated and trained in Canada must successfully complete:

- ◆ an undergraduate engineering degree, accredited by the Canadian Engineering Accreditation Board or CEAB (a standing committee of the Canadian Council of Professional Engineers) or equivalent education;
- ◆ an exam on engineering law and ethics; and
- ◆ four years of qualifying engineering experience, under the supervision of a P.Eng.

National, quality-based criteria are used to assess and determine the acceptability of licence applicants' engineering experience, which will usually be within their area of academic qualification. The criteria involve the application of engineering theory, practical experience, management of engineering projects, development of communication skills and awareness of the social implications of engineering.

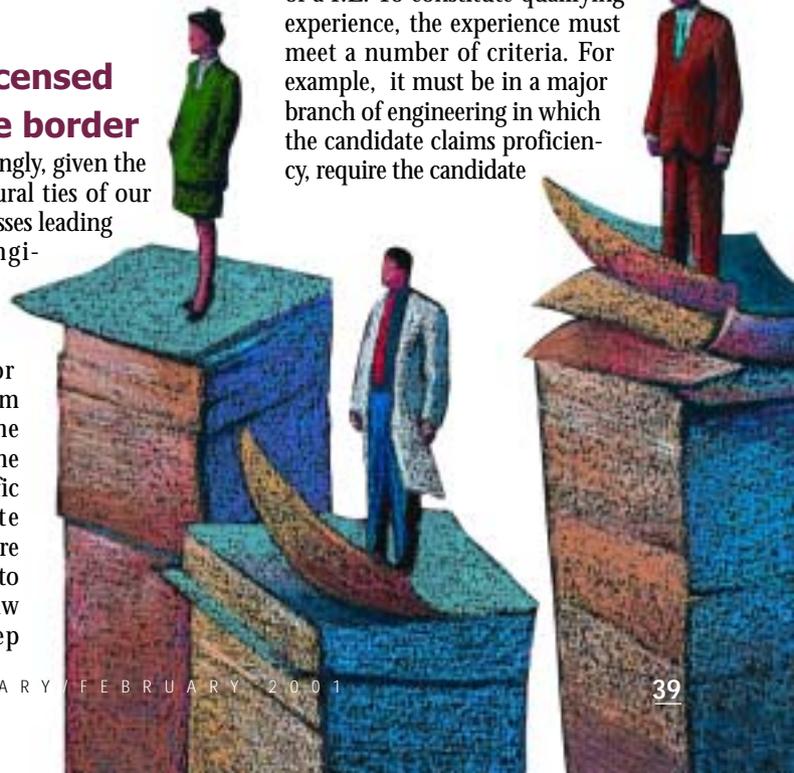
In Canada, provincial professional engineering acts provide engineering licensing bodies (such as PEO) with their statutory mandates and define the scope of professional engineering work. Only licensed P.Engs can take responsibility for work defined in this legislation as professional engineering. Ontario and other provinces have other laws, commonly called "demand-side legislation," that specify that certain kinds of work with explicit public safety implications must be done by licensed P.Engs. For example, under the Building Code Act, structural steel drawings for a building require the stamp of a licensed professional engineer.

Getting licensed south of the border

Perhaps not surprisingly, given the economic and cultural ties of our countries, the processes leading to professional engineering licensure in the U.S. and Canada are fairly similar—except for additional exam requirements in the states. Although the language and specific provisions of state engineering licensure laws vary from state to state, every state law outlines a four-step

process leading to licensure as a professional engineer or P.E. The process involves:

- ◆ a four-year engineering degree program, accredited by the Accreditation Board for Engineering and Technology or ABET (a CEAB degree is usually considered to be equivalent to an ABET-accredited degree);
- ◆ a fundamentals of engineering or technical exam, which, if passed, certifies the candidate as an engineer-in-training or engineer-intern;
- ◆ four years of qualifying engineering experience, under the supervision of a P.E. To constitute qualifying experience, the experience must meet a number of criteria. For example, it must be in a major branch of engineering in which the candidate claims proficiency, require the candidate





to develop technical skill and initiative in the application of engineering principles and enable him or her to develop the capacity to assume professional responsibility for engineering work; and

- ◆ a principles and practice of engineering exam, which, if passed, qualifies the candidate as a licensed P.E. This exam tests the applicant's understanding of ethics, professional concepts and the application of principles of practice.

Several states also require periodic proof of continuing professional development to maintain a professional engineering licence.

In the U.S., whether an engineer needs a licence to practise generally depends on where they work and sometimes on their job title. For instance, employee engineers in industry are not required to be licensed. But engineers in private practice who are in responsible charge of work must be licensed professional engineers, whether they are principals or employees.

Licensure for government engineers is not required across the board. However, many American states and municipalities have statutes, ordinances and rulings requiring that certain government engineering positions—particularly those at the higher-level—be filled by licensed professional engineers. Several federal agencies have adopted policies requiring licensure for selected positions responsible for engineering work. In addition, many states are now requiring that engineering faculty be licensed.

Catching up in Mexico

Although efforts have been made to harmonize professional standards among engineers moving between the U.S., Canada and Mexico under NAFTA, the regulatory regime for Mexican engineers still isn't harmonized. To become a professional engineer in Mexico, you require a four-year engineering degree, followed by two years of community service, which need not necessarily involve engineering work. Aimed at instilling a sense of social responsibility in engineers, this system is common in Spanish-speaking countries south of the U.S.

Mexican engineering graduates who meet this criteria are granted the "Cedula" designation by government. The Cedula is a licence to practise, which is required for engineers in private practice and widely recognized in industry.

Mexico established the CACEI, a

national body that accredits university engineering education programs, in 1995, after signing with the U.S. and Canada the Mutual Recognition Document on cross-border licensing requirements under NAFTA. To meet the terms of the agreement, Mexico was required to set up an independent, accreditation body for engineering education programs, similar to those in Canada and the U.S. So far, the CACEI has accredited about 50 of Mexico's 1000 engineering programs.

C.Eng. versus P.Eng.

The designations chartered engineer (C.Eng.) and professional engineer (P.Eng.) are frequently confused, but there is a fundamental difference between them. P.Eng. is a province- or territory-specific licence to practise professional engineering; no one can legally take responsibility for work defined as professional engineering by legislation in each province and territory unless he or she holds a P.Eng. licence. C.Eng. is a protected title used in the United Kingdom to assure the public that the holder has met a certain standard of education and training. But it is not required by statute to practise the profession. Confusion between the two titles probably arises because of their basic similarity and also because both require demonstration of a similar level of engineering competence.

Although engineers are not licensed in the U.K., the government recognizes the Engineering Council as the national body representing the engineering profession. The Engineering Council is an umbrella organization that facilitates collaboration among the 35 engineering institutions that represent the different engineering disciplines. An individual who has met the Corporate Membership Standards through an institution becomes a member of the institution and is registered as a C.Eng. by the Engineering Council.

To obtain a C.Eng., engineers require four years of academic study or successful completion of Engineering Council exams and a training and professional development period, which must be assessed, along with their competence, in a professional review. Candidates must also demonstrate a commitment to maintaining competence by pursuing continuing professional development and by following relevant codes of conduct and practice.

There are currently about 200,000 C.Eng.s registered with the Engineering Council, most of whom live in the U.K.

Overcoming diversity in Europe

In Europe, the principles and structure of educational and professional systems for engineers vary considerably. But the European community is trying to overcome this diversity through a qualifications system that promotes the mobility of engineers working in European countries.

Qualified engineers can obtain the European Engineer or EUR ING designation granted by the European Coalition of Engineering Associations (FEANI). FEANI is a federation of 27 national members, recognized by the European Commission as representing the engineering profession in Europe. The EUR ING designation is meant to be a guarantee of competence for professional engineers, to facilitate the movement of practising engineers within Europe. Like the C.Eng., EUR ING is a protected title rather than a licence to practise engineering.

To obtain it, engineers require a minimum total period of formation—education and experience—of seven years, including at least three years of engineering education approved by FEANI and two years of valid professional experience. The balance to seven years can be covered by either education or experience. To qualify, engineering experience must include:

- ◆ the solution of problems requiring the application of engineering science, and either
- ◆ the management or guiding of technical staff, or
- ◆ the financial, economic, statutory or legal aspects of engineering tasks, or
- ◆ industrial and/or environmental problems.

Although the FEANI register was introduced in 1987, the EUR ING designation has been slower to catch on than the C.Eng. Currently, out of the estimated 1.5 million engineers in FEANI member countries, only about 25,500 are listed in the FEANI register.

Sources of help

For more information on professional standards for engineers in the jurisdictions discussed, visit the following websites:

- ◆ National Society of Professional Engineers—www.nspe.org;
- ◆ European Coalition of Engineering Associations—www.FEANI.org;
- ◆ Engineering Council—www.engc.org.uk/homepagejs.html. ◆