The Regulation of the Engineering Profession in the Republic of Ireland

A review of the current statutory position and a proposal to move to international best practice

Submission to the Minister for Environment, Heritage and Local Government from Engineers Ireland

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Every engineering process, system or project, across all engineering disciplines, that has an individual or public health or safety dimension or is of significant value or cost, or is potentially damaging to our environment, must be authorised by a Chartered Engineer.
Background

Currently, in Ireland, the extent to which professional titles and functions are protected varies enormously. In the field of health care and medicine, titles such as dentist, doctor and optometrist, are protected with reserved functions strictly defined and enforced in law. This is also the case with lawyers and accountants and others. Practitioners with those titles have legally reserved powers which enhance the public’s trust and sense of security. The public has the right to expect that only those qualified to do highly technical work will be permitted to do so. The current level of regulation and protection of corresponding engineering functions falls far short of the protection afforded in these other areas, notwithstanding the importance, technical nature and potential consequences of the work carried out by professional engineers.

The Smart Economy requires that we in Ireland move from an economy where we manufacture and export products designed by others to one where we design, manufacture and export our own products. Engineers play an essential role in product design teams. An appropriately regulated engineering profession will facilitate the transition to the Smart Economy. Also the Report of the Services Strategy Group (Forfás, 2008) quotes (and agrees with) an ESRI forecast that by 2023 services could account for over 70% of Irish exports and almost 80% of GDP. Engineering services, (in all of their various forms and representing the variety of engineering disciplines) will account for a significant portion of service exports. A properly regulated engineering profession will greatly facilitate the export of engineering services.

This paper outlines the case for enhanced regulation in this area, in order to:

- reduce risk to consumers and clients (including the State) when engaging an engineer as a consultant or employee;
- reduce risks to public health and safety;
- confirm Ireland’s commitment to proper governance and the highest ethical standards in our engineering profession;
- bring Ireland into line with international best practice regarding powers reserved for those with the title of Chartered Engineer;
- recognise the unique responsibilities carried by Chartered Engineers in public and private projects; and,
- improve international competitiveness of the Irish engineering profession.

Achieving Chartered Engineer status in Ireland is unrestricted, provided appropriate competence is demonstrated. The most common route to Chartered status is by securing the appropriate educational standard followed by a number (minimum of four but normally five or more) of years of relevant experience. Alternative routes to Chartered Engineer status also exist for those with other engineering related educational qualifications and those with degrees in cognate areas such as mathematics, science, computing, etc. augmented by career training and experience.

Because of the existing relationships Engineers Ireland enjoys with FEANI (in Europe) and through the Washington Accord (world wide) these proposals do not, in any way, introduce restrictive practices. Graduates of accredited engineering programmes in Europe are welcome here in Ireland and are afforded similar access to CEng status as our own Irish graduates. Similarly our agreements with countries such as Australia, USA, Canada, UK, etc., through the Washington Accord, which make provision for the mobility of Chartered (Professional) Engineers between these countries, will not be affected.

This paper is also based on the following assumptions:

- there is a set of standards and skills that members of the community expect from engineers;
- the work of engineers can have significant impact on health and safety, the natural and aesthetic environment, and cost to the general public; and,
- the title ‘Chartered Engineer’ is restricted to those who have demonstrated appropriate professional standards and skills.

As the body responsible for the regulation of the title “engineer” in Canada has recently noted:

Engineers have a tremendous impact on public safety, the environment and the quality of life in the communities and countries where they work. Engineers design bridges, write software that controls air navigation systems, develop plastics for use in safety equipment—all of which can have an impact far beyond the place and time that they work. One of the very things that makes engineering such a great career—the opportunity to really make a difference—also means the public has a right to expect that only those qualified to do the work, will do it.

Further information on the Canadian system is available at: http://www.engan.ca/english/profession/licensure.html

Professions Australia defines a profession as:

A disciplined group of individuals who adhere to high ethical standards and uphold themselves to, and are accepted by, the public as possessing special knowledge and skills in a widely recognised, organised body of learning derived from education and training at a high level, and who are prepared to exercise this knowledge and these skills in the interest of others.

Irish professional engineers have specialised knowledge and skills which have been honed during their professional education and training, and their role in society and the economy means their work has an impact long beyond the place and time that they work. Engineers Ireland believes that only Chartered Engineers within an appropriately regulated environment should have the authority to sign off on projects that have a public health and safety dimension, or are of significant value or cost, or may potentially damage the environment. Such a regime will act in the public interest and will ensure a strict adherence to high standards and quality. It will bring Ireland into line with international best practice and demonstrate our commitment to pursuing what is right for an unsuspecting public.
Current statutory position in Ireland

The Institution of Civil Engineers of Ireland (Charter Amendment) Act 1969 (a private Act) prescribes limits on the conferring of the title Chartered Engineer by Engineers Ireland.

Subsequent legislation has introduced a small number of areas in which particular functions have been reserved to persons entitled to describe themselves as Chartered Engineers. For example, following the gas explosion in Raglan House, Ballsbridge in 1987 in which a number of people lost their lives, the Oireachtas decided that in order to protect public health and safety against a recurrence of such a catastrophe, the function of investigating and certifying the existing stock of multi storey buildings of five or more storeys, and associated gas supply systems, would be reserved to Chartered Engineers.

This is provided for in the Local Government (Multi Storey Buildings) Act 1988. This became the first function reserved to Chartered Engineers. A limited number of other functions were also assigned at later dates.

The following legislation, limited to the construction industry, contains all the functions which are the total statutorily reserved to Chartered Engineers in Ireland:


International best practice

Canada and some states of Australia are regarded as examples of international best practice in the regulation of the title and work of the professional engineer. In Canada, Engineering is regulated in the public interest by self-governing professional licensing bodies. These bodies were established by Canada’s 13 provincial and territorial governments through Engineering Acts. Essentially, the provincial and territorial governments have delegated their constitutional authority to regulate engineers and engineering in Canada to professional licensing bodies that are maintained and governed by the profession, creating a system of self-regulation.

Each of Canada’s licensing bodies regulation mandate and it’s obligation to undertake this role is laid out in the Engineering Act through which it was created. Although each Act is slightly different, most also define a scope of practice for engineers and specifically restrict the use of the title engineer to individuals who have been licensed by the engineering licensing body in the province or territory in which the Act applies.

And Canadian Law states that (with certain exceptions): “...no person shall engage in the practice of professional engineering or hold himself, herself or itself out as engaging in the practice of professional engineering unless the person is the holder of a license...No person shall offer to the public or engage in the business of providing to the public services that are within the practice of professional engineering except under and in accordance with a certificate of authorisation”.

In Australia, a variety of forms of regulation and protection of the title of engineer emerged. There is no single regulatory regime for engineers in Australia. Under the Australian Constitution, regulation of professional services is a matter for State and Territory Governments, and therefore each jurisdiction regulates the engineering profession in a variety of ways. For instance, Queensland has a registration system for professional engineers, but does not include registration of engineering technologists and engineering associates.

As a result, there are many regulatory and quasi-regulatory regimes maintained across jurisdictions by local and state government that come into existence because of the absence of a comprehensive, consistent statutory registration system for engineers.

In New Zealand engineers are registered under the Chartered Professional Engineers of New Zealand Act 2002 (CPEng Act). The register lists engineers regarded as currently competent (i.e., having recently demonstrated their competence) for professional engineering practice in New Zealand. The Act establishes a requirement that to retain registration engineers must demonstrate regularly (every five years, or more frequently) that they are still able to practice competently. The CPEng Act also establishes procedures by which complaints in respect of the performance of engineering services in an unsatisfactory or negligent manner, or in respect of unethical behaviour, are to be investigated by the registration authority.

We now have an opportunity in Ireland to demonstrate both here at home and to potential foreign investors that Ireland’s Engineering Profession is dedicated to and built upon the highest quality and standards.
Recognition of responsibility

The reservation in law of certain powers to those who are trained, qualified and licensed Chartered Engineers is a public way of recognising the responsibility which is given to engineers across all sectors. Engineers require specialised skills and knowledge (including having a grounding in mathematics and science), and they undergo a lengthy period of practical training in order to practice. Across the world and in all sectors of the economy, professional engineers have a responsibility, and are relied upon, to uphold standards in ethics, rigour and robustness of design, rational thinking, sustainability and most importantly, public safety.

As Engineers Australia has noted, an engineer’s job is to plan, design and implement projects ranging from the smallest consumer item to the largest of industrial processes. Professional engineers are required to take responsibility for engineering projects and programmes in the most far-reaching sense. This includes the reliable functioning of all materials and technologies used; their integration to form a complete and internally consistent whole; and the relationship between technical systems and the environment in which they function.

The disciplines of engineering are wide ranging in scope and the practice of engineering in all these disciplines affects society and the environment in a wide variety of ways.

The disciplines of engineering include:
- aeronautical
- biomedical and clinical
- building services
- chemical and process
- civil and structural
- computer and software engineering
- electrical and electronic engineering
- environmental
- fire safety
- food and agricultural
- geotechnical
- industrial and manufacturing
- mechanical

Engineers from these and other disciplines work in areas such as:
- assistive technologies for disabled people
- biomedical devices
- design of machines
- education
- electronic devices
- energy systems
- exploration for, production and distribution of oil and natural gas
- flood control and arterial drainage
- food processing
- generation and distribution of electricity from fossil fuels and renewables
- hospitals
- manufacturing
- packaging
- pharmaceuticals
- public transport
- roads, bridges, buildings
- software programmes
- the design of machines
- waste management
- wastewater treatment
- water supply systems

It is self-evident that decisions made in all these areas have an enormous potential impact on public health and safety, on the environment, on the economy and quality of life and it is argued should be reserved to those who have been properly trained and educated in the relevant fields and have attained the appropriate competency by experience as judged by their peers, i.e., have secured the title of Chartered Engineer.

Reduce risks to health and safety

In addition to the risks for consumers discussed above, another major risk associated with the delivery of engineering services is the potential threat they pose to public safety, health and welfare if they are not implemented by appropriately qualified and competent practitioners. Risks to consumers of engineering services relate mainly to financial and safety, health and welfare issues associated with engaging inadequately or inappropriately qualified persons to undertake engineering works. The consequences of misjudgement can be costly in either financial or human terms. Aside from immediate health and safety implications of engaging poor engineering services, there can be enormous financial costs to the community associated with the delivery of poor engineering services. As Engineers Australia noted, the most notable areas where failures have had fatal consequences are fairground equipment inspection, bridge design, demolition, alpine road construction, pressure vessel design and more recently, the cyclone resistance of buildings.

In an Irish context, the aging of the recently upgraded public infrastructure stock means further investment in the repair, maintenance and upgrade of public buildings and civil engineering projects over the next decades. The maintenance of these facilities is necessary to prevent failure and will call into demand new engineering expertise.
Developing an export industry

In a globalised marketplace, the demand for professional skills has meant the emergence of a professional export industry. Canada and Australia are well recognised as examples of international best practice in the recognition of engineering expertise. Both countries have seen an increased international demand for their engineering professionals following the introduction of regulation and statutory reservation of functions.

As Engineers Australia has noted during the process of registering Western Australian engineers: “The recognition of Australian engineering qualifications and competencies through a system of registration will serve to further enable the mobility of Australian engineers overseas to the benefit of the Australian economy.”

Promoting continuing professional development

Continuing professional development (CPD) allows professionals across all sectors to keep their knowledge and skills up-to-date, and demonstrates a high standard of professionalism. There is a community expectation that professionals will continue to keep pace with advancing knowledge and technology.

A Chartered Engineer is an engineer competent to practise unsupervised, to the highest standards; capable of exercising independent judgement; committed to maintaining professional currency; and accountable for quality, safety and ethical behaviour. Not just an engineer who was competent some time in the past but one maintaining active capability and competency to utilise the latest techniques in their field. For this reason it is our intention at Engineers Ireland to introduce compulsory CPD for those securing the title of CEng (as is the norm with most professions) to ensure currency, quality and the highest standards.

Conclusion and proposal

Irish and international consumers expect that the professional they engage will be trained and qualified and up-to-date in order to provide them with best quality services and that only such persons can put themselves forward as being competent to do so. In an engineering context, a failure to provide those services has the potential to create severe financial loss, as well as posing significant risks to public safety and the environment.

We must not wait until a major engineering system, process or piece of infrastructure failure, with the inevitable consequences, takes place. Surely we now have a wonderful opportunity to learn from the trauma visited on every citizen of Ireland by virtue of the recent regulatory failures in our financial services sector.

In summary, this proposal from Engineers Ireland, seeks through enhanced regulation, to have every engineering process, system or project that has an individual or public health and safety dimension, is of significant value/cost, or potentially damaging to our environment, authorised only by a Chartered Engineer.

If accepted this will:
■ protect an unsuspecting public;
■ demonstrate Ireland’s commitment to proper governance and ethical behaviour;
■ engender confidence in and enhance the quality and standards of the engineering profession in Ireland;

When serious failures occur in the engineered environment, they can result in death, financial loss and widespread public disquiet and lack of confidence. It is in the interest of the public, and of the State's finances, for the Government to ensure that the potential for such failures is minimised. This can best be achieved by statutory control and licensing in such a way as to ensure that critical engineering sign-off is carried out only by those who are competent to do so, i.e. by licensed Chartered Engineers. To that end, Engineers Ireland proposes that a system of statutory control and licensing akin to that in Canada be introduced here. Engineers Ireland proposes that it could act, under such a new system, as the licensing body for the profession, charged with responsibility to promote and support public confidence in engineering and ensuring that the profession is one that best serves the public, the State and the environment.