

## ENGINEERING LEADERSHIP CONFERENCE 2008

### *Engineers Driving Australia's Future*

#### Management, Leadership and Registration

During the next twenty minutes I would like to give you a glimpse of registration models used around the globe for engineering professionals, to focus on what can work in Australia and finally to paint the leader and manager into the picture.

The concepts of leadership and management in engineering I believe are well understood, though each of us might have subtly different definitions of how they work out in our own situation.

However, I have the feeling that concepts of registration in engineering may vary much more widely if I were to ask for opinions in this room. Indeed, the use of registration in various economies around the world well illustrates the spectrum of opinion. Let me open with a discussion of registration to set the scene for bringing these three concepts together.

Why would there be a need for registration of engineering professionals? What would registration require of an engineering practitioner that is not required of a self regulating professional? What benefit could registration deliver to the engineering profession? Can registration better protect the community than self regulation by the professional body?

Before I try to answer those questions, let's think about situations where we would expect to find registration. Health professionals in Australia mostly need to be registered. Why? To show that they have met certain qualification requirements? Yes. So that those who do not do the right thing can be effectively sanctioned? Maybe. De-registering a health professional we know is a major issue. Headlines stuff.

So what registration systems exist around the world for engineers? To illustrate the spectrum of approaches I will briefly describe registration in North America, in the UK and Western Europe and in some Asian economies.

Canada probably has the tightest registration system, though there are minor variations between provinces. An engineer must be registered by a provincial board before calling himself an engineer, let alone offering a professional engineering service. Accordingly, most boards register "engineers in training" as well as professional engineers.

The USA boasts 56 registration boards (in 50 states, mind you), each of which has its unique legislation and rules regarding engineering qualifications and practice standards. Most of the boards rely on an examination body (known as the National Council of Examiners for Engineering and Surveying (NCEES) as the gatekeeper.

What about Europe? The registration authority in the UK is the Engineering Council. ECUK uses a set of competencies, known as UK-SPEC, as the standard for registration. In Europe, the registering body is European Federation of National Engineering Associations (FEANI). In either case registered engineers use a protected title, CEng in the UK and EURING in 29 countries in Europe covering 3.5 million professional engineers.

Nearer to home, our Asian neighbours use a variety of registration and licensing arrangements. The PEB in Singapore protests that it has an open registration system. Some softening of their legislation is being considered, which should limit the PEB's influence to the built environment.

Japan has two registration systems for engineers under separate ministries and under separate legislation. Engineers Australia achieved an agreement with the Ministry for Science to facilitate the mobility of engineers working in areas outside infrastructure.

How has Engineers Australia sought to influence the regulation of engineering in Australia? Registration was an item on the agenda of the first meeting of the Council of the Institution of Engineers, Australia in the year 1919. The only state to pick up on the need, as articulated at that time, was Queensland.

It does so by the *Professional Engineers Act 2002* (QLD) which establishes a board to register professional engineers and requires that anyone who offers or provides a professional engineering service must be registered as a Registered Professional Engineer of Queensland (RPEQ). Engineers working under the direct supervision of an RPEQ do not need to be registered.

So how is engineering activity regulated in Australia? Essentially it's a State responsibility under our Constitution. And every State does it with different degrees of short-sightedness.

Some legislation referred to Associate Members. Building ordinances and ultimately, the Building Code and related standards talked about Corporate Members of the Institution; others to eligibility for such grades. The problem with such terms only becomes apparent when the professional body changes them, which it has a perfect right to do.

In 1989, agreement was reached between the principal engineering bodies in Australia to implement the National Professional Engineers Register, initially as Sections 1 and 2.

In 1994, Section 3 of NPER was launched and regulators became familiar with NPER-3, a term still in wide use today. Section 3 differed from the earlier sections of NPER in three major ways. It required applicants to be currently practising engineering in their discipline, as designated by their College of Engineering. It also required registrants to respond to periodic audits of continuing professional development.

Along with the introduction of NPER Section 3, Engineers Australia, thirdly, convened a body, initially called the Registration Board and later became the National Engineering Registration Board.

This board has grown in influence as its membership has embraced more community representatives and now includes government representatives of all but one State and Territory. The introduction of Section 3 opened the door to two important advances:

1. Legislation in States and Territories had a new benchmark for engineering that was not overtly tied to a single professional body, though it's always been administered by Engineers Australia. Victoria's Building Act, South Australia's Development Act were the first to refer to NPER. Most other state and many local jurisdictions have followed.
2. Several Mutual Recognition Agreements with prominent overseas professional engineering associations were established, such as the Institutions of Civil, Mechanical and Electrical Engineers in the UK.

After lengthy negotiations with the ACEA and APESMA all parties agreed to drop Sections 1 and 2 and NPER-3 became simply NPER in 1997.

In August 2006, the Board invited representatives of ACEA and AMESMA to join it for a workshop in Brisbane which looked at what would be needed to take the registration system to the next level. At the conclusion of a wide ranging discussion it was agreed that there seemed to be two alternatives:

1. registration should be driven by market forces – demand driven
2. registration should become mandatory under uniform legislation in all jurisdictions.

The workshop also agreed that the second alternative had obvious advantages though it would require greater effort to achieve.

Following the workshop, the board was given the task of building a case for mandatory registration.

The initial statements of the rationale for mandating registration of engineering practitioners were based on two main precepts:

1. protection of public health and safety
2. consumer protection – particularly where consumers of engineering services can be considered to be uninformed or poorly informed purchasers.

Secondary considerations in relation to mandating registration included:

1. it prevents persons who cannot demonstrate current competence from performing engineering services unsupervised
2. it prevents registered practitioners from offering services outside their registered area
3. it enforces observance of a code of conduct and ethics
4. it makes disciplinary sanctions legally enforceable
5. it provides a publicly available list of approved engineering practitioners.

The rationale for mandating registration has evolved since 2006 as further needs have come to light. The de-engineering of state and local government departments has impaired their capacity as informed procurers of engineering services; major corporations' recruitment staff and individuals engaging engineering services increasingly need a ready reliable register of competent practitioners to choose from. The professional engineer's capacity to deal with conflicting corporate responsibilities is enhanced. Increased levels of registration would assist these parties.

Wishing to draw attention to the challenges and compliance costs engineers incur practising in more than one Australian jurisdiction, the Chairman of NERB wrote recently to Lindsay Tanner, who chairs the Council of Australian Governments working group on Business Regulation and Competition, advancing a national registration system along the following lines.

1. There is no formal system of regulation for engineers. There are many pieces of subordinate legislation, such as regulations, by-laws and orders-in-council that impose various prescriptive standards and incur unnecessary costs to the engineering industry in complying.
2. Since Australia is suffering from a significant shortage of engineers, the mobility of these skills is paramount to economic growth and a national system of registration would facilitate this.
3. The use of the title 'registered engineer' should be restricted to those who have demonstrated professional level standards and skills.
4. The enforcement of a common set of standards, skills and continued professional development requirements that the community expects of its engineers is in the best interests of public safety, health and welfare and consumer protection.

5. An adequate protection from health and safety failures is achieved only through a registration system that requires the accreditation of current competency to practice and an auditable commitment to keeping up to date.
6. A nationally consistent system of registration of engineering practitioners should be based on a system of registration established by the profession with the full support of the peak professional engineering bodies and active participation by State and Territory governments.

A nationally consistent system of registration could be based on the *Professional Engineers Act of Queensland*. Recent changes to the *Professional Engineers Act 2002 (QLD)* have enabled Engineers Australia to apply for and receive the Minister's approval for a scheme for assessing the qualifications and competencies of engineers who wish to apply for registration in Queensland. The standards and procedures offered in the scheme are identical to those used for registration on NPER and for Chartered Professional Engineer (CPEng) member of Engineers Australia.

Unexpectedly, the greatest challenge that Engineers Australia faces from any proposal for mandatory registration of professional engineers is what to do about the other members of the engineering team; the Engineering Technologists and Engineering Associates.

However, it turns out that including technologists and associates in the registration system will help address the prevailing skills shortage in Australia.

Where Engineering Associates and Engineering Technologists are appropriately registered to deliver services within their areas of competence, professional engineers will no longer have to sign-off on those services. The associates' and technologists' registration will be in jeopardy if they provide inadequate services or offer services outside their areas. This will considerably reduce duplication of effort and in some cases unethical behaviour on the part of the professional engineer who signs off work without checking it. Engineers will be freed up to do engineering!

By the way, an incremental rise in standards proposed by the *Washington Accord* Signatories, specifically to strengthen the professional engineer's research capability may provide greater scope for Engineering Technologists.

Incidentally, the proposal for legislation to regulate the engineering profession here in Western Australia features a serious discussion of including technologists and associates.

What will be the position of the manager and leader under a regulation that requires responsible engineers to be registered? To be consistent with policy on registration in the technical areas, registration will require a competency based assessment and accreditation framework for engineers with a proven professional engineering track record who are interested in pursuing management and leadership opportunities in both the private and public sectors.

Just such a framework has been developed by a taskforce of the Centre for Engineering Leadership and Management. It is known as *Engineering Executive*.

The status of *Engineering Executive* will be available to professional engineers, engineering technologists and engineering associates who can satisfy the competency requirements, and who are members of Engineers Australia. Chartered status is not a pre-requisite.

As the reputation of the *Engineering Executive* status, with its post-nominal *EngExec*, becomes known in the wider market, Engineers Australia is confident that engineers with this qualification will be held in high regard. Engineering Executives will be acknowledged as understanding and

achieving very high personal and professional standards of leadership, business acumen, and management skills.

In an effort to translate the detailed competencies that underpin *EngExec* into language that is being used at this conference, I would like to offer the following “feel-good” statements for each unit, based on the elements and defining activities of the competency standard.

### **Leadership**

- 1 Leadership - exercised genuinely and creatively in the interests of the business workplace and operational environment – as exemplified by Doug Aberle on Thursday morning
- 2 Strategic Direction and Entrepreneurship – champions and achieves sound technological & organisational innovation cooperatively in new ventures, accommodating the chaos of real life

### **Management**

- 3 Planning – applies market knowledge to operational and business planning, embracing personnel and technology needs to prepare for the future as described by Else Shepherd
- 4 Change and Improvement – the needs and opportunity for improvements are identified, informed, planned and achieved in a timely manner
- 5 Customer Focus – customers are understood and appreciated
- 6 Processes, Products and Services – grows business through innovation and process improvement, measuring performance against customer expectations by surpassing established standards and competitors’ output
- 7 People/Human Resources – recruits, monitors, develops and dismisses staff with equitable processes that protect the organisation’s image and reputation in an environment of self understanding and responsiveness as described by Doug Aberle in the context of Western Power, yesterday

### **Business**

- 8 Supplier Relationships – responsible for supplier relationship selection criteria and process, terms of engagement and supplier performance monitoring records
- 9 Information – arranges for organisational information resources in an accessible format for analysis, interpretation, planning and reporting
- 10 Finance, Accounting and Administration – monitors and controls financial and accounting information and people

The competencies required to achieve the Eng Exec credential correspond largely with earlier criteria for NPER – Management. Originally and applicant’s qualifications and experience had to demonstrate that management qualifications had been achieved or that acceptable management knowledge and skills had been acquired in other ways. Applicants also had to prove they had moved into the management or administrative position as a progression of their professional career. This was an inputs-based assessment.

The Eng Exec process is appropriate for the registration of Engineering Leaders and Managers under the Approved Assessment Scheme for registration in Queensland. NPER - Management is for practitioners who undertake functions recognised as being managerial rather than technical in content. Applicants seeking registration under the management category would be expected to be undertaking activities which call upon their engineering qualifications and experience. Such

managerial activities might typically include general management in an engineering environment; policy development; quality assurance and total quality management; design and delivery of training programs; marketing of engineering products or services; financial or human resource management.

NPER has offered registration in an area styled “Management” since its inception in 1994, the first registrant being the then Chairman of Western Mining Corporation.

Engineering managers supervising engineering staff in Queensland are required by law to be Registered Professional Engineers of Queensland (RPEQ) and are expected to hold that credential to sign off engineering services under collateral legislation in that State. Engineers Australia’s Approved Assessment Scheme gives the opportunity for leaders and managers to comply with any system of mandatory registration.

The National Engineering Registration Board maintains the view that the managers and leaders of engineering corporations, projects and programs ought to be able to demonstrate their commitment to continuing professional development and practice within their leadership or managerial role through registration.

Registration in Management need not be exclusive to NPER. Eng Exec competencies can readily be applied to applications for registration by Engineering Technologists and Engineering Associates. As the case for mandatory registration strengthens and broadens to include the whole engineering team, there is room for our leaders and managers in all occupational groups.

Thank you.

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