INQUIRY INTO DEFENCE PROCUREMENT

Comments to the Senate Standing Committee on Foreign Affairs, Defence & Trade

12 August 2011

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ENGINEERS
AUSTRALIA

1. Introduction

Engineers Australia is the peak body for engineering practitioners in Australia, representing all disciplines and branches of engineering. Membership is now approximately 96,000 Australia wide and Engineers Australia is the largest and most diverse professional engineering association in Australia. All Engineers Australia members are bound by a common commitment to promote engineering and to facilitate its practice for the common good.

Almost a decade ago Engineers Australia drew attention to the risks associated with inadequate assessments of engineering and technical aspects of defence procurements. These concerns were documented in a comprehensive report and Engineers Australia's recommendations on the way forward were summarised in a companion policy statement. Engineers Australia believes that these recommendations are as relevant today as when they were made and commends them to the Committee for consideration in its final report.

The engineering labour market in Australia remains tight but there are approaches available to more adequately deal with the situation, including improved utilisation of existing engineering resources whether in-house or contracted. However, simply dealing with concerns about the quantitative dimension of engineering resources loses sight of the critical importance of the qualitative aspect of engineering services.

Engineers Australia believes that a national registration system for engineers is an indispensible component of a strategy to upgrade assessment of the engineering and technical aspects of defence procurement and commends such a system to the Committee for its support.

2. Government as an Informed Buyer

During the 1980s and 1990s engineering establishments in government agencies at all levels, including in defence, were seriously reduced. Engineers Australia drew attention to the risks associated with the ensuing loss of engineering expertise in its 2000 report "Government as an Informed Buyer"[1] and in its policy on government purchasing agreed in 2003[2]. The risks identified included:

- The inability to manage engineering contracts because contracting staff lacked the necessary technical expertise.
- The inability of contract staff to adequately assess the engineering competencies of contractors and sub-contractors.

These risks open the possibility of large financial and human costs that have been detailed in coronial enquiries[3], in Australian National Audit Office reports and in numerous Ministerial statements.

In its policy statement, Engineers Australia proposed a set of recommendations[4]and methodological advice to ensure that government as a buyer of engineering, information

[1] Athol Yates, Government as an Informed Buyer, Recognising technical expertise as a crucial factor in the success of engineering contracts, Institution of Engineers, Australia, Canberra, 2000, www.engineersaustralia.org.au
[2] Engineers Australia, Public Policy Guide, 2003, p15, www.engineersaustralia.org.au
[3] See Appendix 2 in Yates, op cit and

technology and other technical goods and services adequately addressed technical and engineering risks. The recommendations recognised the changes occurring in the public sector, in particular decentralisation of control and devolution of decision making, and the broader environment in which defence procurement takes place, notably increasing technological complexity and the frequency of very large purchases. A copy of Engineers Australia's policy is attached to this submission.

Engineers Australia believes that it is insufficient to rely on the significant contract management expertise that has been developed in defence procurement. These skills are vital, but are not a substitute for technical engineering expertise. This is not an argument about "protecting" engineering jobs within defence organisations, but an argument about obtaining value for money in defence procurement. If equipment is incapable of delivering the technical capabilities required, excellent contract management will not prevent contract failure.

Engineers Australia believes that the necessary expertise can be either in-house or acquired externally. There are advantages and disadvantages for both approaches and these should be comprehended by senior management and integrated into the purchasing decision framework. Ultimately, the benefits of technical and engineering expertise are best utilised:

- When senior management are assured and convinced that the necessary technical advice has been sought, understood and taken into account.
- The appropriate balance between technical and commercial considerations has been achieved and "gold plating" has been avoided.
- That all relevant points of view have been considered in reaching a final decision, including candid assessments of equipment performance and ex-post assessment of weaknesses in the statement of requirements.

Engineers Australia is aware of steps being taken within defence agencies and defence contractors to improve the professionalism of engineering staff. Engineers Australia is working with these organisations:

- To increase the number of engineers achieving chartered membership status to verify their commitment to continuous professional development and high engineering standards.
- To encourage greater participation in their initial and continuing professional development.
- To upgrade the engineering qualifications of existing staff through articulation programs to the levels appropriate to full participation in the engineering team.

However, Engineers Australia believes that more can be done to reinforce these efforts by senior defence engineers and by senior management to ensure that technical and engineering elements of procurement are fully integrated into purchasing structures and arrangements.

3. The Engineering Labour Market in Australia

This section considers the quantitative aspects of the engineering team in Australia. The engineering team comprises professional engineers (at least the equivalent of a four year full time degree in engineering), engineering technologists (the equivalent of a three year full time degree in engineering) and engineering associates (the equivalent of a two year full time associate degree or advanced diploma or diploma in engineering).

[4] See Yate, op cit, pp7-8

Skills and skills development have been important topics in Australian policy forums for at least the past two decades. Yet statistics for specific occupations and skills are fragmented and patchy. The statistics discussed in this sector are extracts from Engineers Australia's Annual Statistical Overview and are derived from official sources[5]. Conventional labour market definitions are employed; thus the engineering population is the subset of the Australian population with formal qualifications consistent with the engineering team; the engineering labour force is the subset of the engineering population that is employed or unemployed and actively seeking work.

The engineering labour market, like skills in general, in Australia has been very tight during the past decade. The demand for engineers, as measured by employment, has grown by an average 4.8% per annum up to 2010, from 232,700 in 2001 to 352,900 in 2010. The supply of engineers, as measured by the engineering labour force, also grew at an annual average 4.8% from 242,200 in 2001 to 366,600 in 2010. Both demand and supply grew faster than the 4.5% average annual growth in the engineering population. The changes underlying this were a falling unemployment rate and a rising labour force participation rate. Indeed labour force participation in the engineering labour market is exceptionally high, averaging more than 90% over the past decade, several percentage points higher than comparable non-engineering skills.

Just prior to the Global Financial Crisis (GFC), engineering unemployment was 2.4%, a figure consistent with frictional unemployment, the short periods of technical unemployment individuals experience when moving from one job to another. The GFC resulted in an increase in engineering unemployment to 4.1% in 2009 before recovering to 3.7% in 2010. This recovery is expected to continue in coming years but the structural changes in the economy favouring the resources sector is expected to include similar changes in the industry distribution of engineers.

The number of permanent residents trained as engineers in Australia has averaged about 9,500 since about 2006, about 6,000 new degree qualified engineers from the universities and about 3,500 associate degrees and diploma qualified engineers. Firm statistics on retirements from the engineering labour force are not available but there are indications suggesting that about 5,000 to 6,000 engineers turn 65 years old and are no longer included in the survey population. In other words, since about 2006, net domestic growth in the engineering labour force is about 10,000 per year. In comparison, the demand for engineers has been about 13,000 per year and as high as 22,000. The balancing factor has been high skilled immigration.

The best available proxy for the trend in skilled migration is the overseas born segment of the engineering labour force. This measure includes children born overseas to migrant parents but effectively raised and trained in Australia and former migrants who have been resident in Australia for significant time. While some of the changes in the overseas born engineering labour force can be attributed to these factors, the most important influence has been recent skilled migration.

Average annual growth in employment for the overseas born engineering labour force has been 7.9%, three times average annual growth in employment for the Australian born engineering labour force (2.5%). The result has been a large increase in the dependence of the engineering labour force as a whole on persons born overseas. In 2001, there were 41.8% overseas born individuals in the engineering labour force but by 2010 this had increased to 52.6%. The overseas

[5] Engineers Australia, The Engineering Profession; A Statistical Overview, Eight Edition, 2011, www.engineersaustralia.org.au

components of comparable non-engineering skills and the general labour force also increased over the decade but in 2010 were only 36.6% and 26.8% respectively.

These trends contain several implications for recruiting additional engineers to defence procurement. First, citizenship requirements for personnel in the public service and the military mean that in-house recruitment of engineers to work in defence procurement will need to draw from the slower growing of the engineering labour force (the Australian born segment). In other words, in-house recruiting may be more difficult than overall statistics suggest. Second, a window of opportunity may open up as a result of realignment of the industry distribution of the engineering labour force between the resources and non-resources sectors. Although there is high demand for engineers in the resources sector, not all engineers will want to work there. Third, the stronger growth in the in the overseas born segment of the engineering labour force suggests that contracted engineering services may offer opportunities not available to public sector employers.

Finally, consideration can be given to how engineering resources are presently deployed in defence procurement and whether these resources could be better utilised. This point can be illustrated using 2006 census statistics. While the statistics themselves may be relatively old, the point they illustrate remains relevant.

The ABS defines the defence industry as consisting of units of military defence, both staffed by uniformed and civilian personnel, engaged in defence administration, administration of defence research and development, defence contingency planning and the conduct of military exercises involving civilian institutions and populations. This definition focuses primarily on the government military and defence organisations and does not include private sector enterprises providing goods and services to defence.

In 2006 there were 7,197 individuals (6,842 men and 355 women) belonging to the engineering labour force employed in the defence industry. This was 2.9% of the Australian engineering labour force and 36.2% of the engineering labour force employed by the Commonwealth Government. An individual who belongs to the engineering labour force does not necessarily work in an engineering occupation. This distinction is explained in some detail in an Engineers Australia publication that also includes estimates of the numbers in the engineering labour force and the proportions employed in engineering for different segments of the Australian economy. In defence, it was estimated that 4,780 individuals (4,525 men and 255 women) belonging to the engineering labour force were employed undertaking engineering work. The remaining 2,417 (2317 men and 100 women) were not employed in engineering work even though they held formal qualifications consistent with the engineering team.

The proportion of the engineering labour force utilised in engineering work in defence was 66.4%, slightly higher than the corresponding proportion for the Commonwealth Government sector (65.7%). However, both figures were significantly higher than the 57.2% of the Australian engineering labour force that was utilised in engineering work.What these statistics suggest is that redesigning staff policies to attract individuals who are already qualified as engineers, but not currently working in engineering, have significant potential. This approach can be applied to existing staff that have defence experience and engineering qualifications and to the wider labour market.

4. Registration of Engineers

Engineers Australia strongly supports a national system for the registration of engineers. The objectives for the national registration of engineers is to ensure that engineering services are delivered by individuals who hold appropriate educational qualifications, have work experience consistent with accepted and recognised international engineering standards and demonstrate a commitment to continuing professional development. Currently there is no uniform registration system covering engineers in Australia. Engineering services are regulated by more than a dozen different Acts, regulations, by-laws and orders-in-council in different jurisdictions. Many are not specific to engineering services and often relate to the building and construction industry. Queensland is the only State where engineers must be formally registered to provide professional engineering services.[6]

As well as underpinning the quality of engineering services, a national registration system offers additional benefits including:

- Enhancing the mobility of properly qualified engineers between jurisdictions and industries
- Facilitating the productive integration of migrant engineers into the Australian labour market
- Help to overcome skill shortages by maximising the productivity of the existing engineering labour force
- Provides competency benchmarks for clients and employers of engineers
- Minimising the costs to clients resulting from sub-standard engineering services delivered by individuals who are not qualified to offer these services
- Reducing the red tape involved with compliance arrangements

As a professional organisation, Engineers Australia accredits the engineering courses taught in Australian universities using competencies that are regularly audited against international standards and is now transitioning these arrangements to the TAFE system. Engineers Australia applies the same competencies to assess the qualifications of prospective migrants under skilled migrant programs.

Engineers Australia believes that it is not sufficient to apply internationally recognised standards to the commencement of an engineering career. There are corresponding standards that apply to an engineer's work experience, especially in specialised fields of practice. Engineers Australia recognises this issue in the progressive structure of its membership culminating in Chartered status at the relevant engineering team level. Chartered status is defined by a higher set of competencies than applied to degree accreditation and signifies the engineer offers all the attributes of professionalism required from an engineer. Chartered status qualifies individuals for voluntary registration with the National Engineering Registration Board.

Engineers Australia consistently applies its competencies and recognition framework to its members. Formal registration of engineers in a national registration scheme would apply similar standards to all practicing engineers, whether members of Engineers Australia or not. Engineers Australia believes that the work carried out by engineers is of fundamental importance to

[6] National Engineering Registration Board, *The Regulation of Engineers: Finding the right approach for a national economy*, National Engineering Registration Board, http://issuu.com/engineersaustralia/docs/regulation_of_engineers_brochure_rev3_/1?mode=a_p

Australian growth and the well-being of Australians and that the assurance of national registration is essential to Australia's future.

5. Recommendation

Engineers Australia believes that the recommendations made in its policy statement on engineering for defence set out a framework to satisfactorily analyse and manage the engineering and technical aspects of major procurements. Engineers Australia recommends that the Committee consider the recommendations in the policy statement when formulating its final report.

The engineering labour market in Australia remains tight but there are approaches available to more adequately deal with the situation, including improved utilisation of existing engineering resources whether in-house or contracted. Engineers Australia believes that a national registration system for engineers is an integral component of such a strategy and commends it to the Committee.