

# **Inquiry into the Shortage of Engineering and Related Employment Skills – A Recruitment Perspective by JSM Appointments**

(February 2012)

## **Scope of Submission**

The shortage of engineering and related employment skills in Australia cannot be better illustrated than by observing the persistent engagement and retention difficulties being experienced among employers within the affected industries. In their dealing with the ongoing search, selection and engagement processes that make up the daily activity associated with recruiting engineering skills, employment service providers such as JSM Appointments are witness to the dire consequences of this problem. The trends and patterns that have emerged reveal both a short term and growing longer term skills shortage, each likely to require different strategies to mitigate.

This submission comments on issues observed during recruitment activity that relate the short and long term shortages, or as is often the case – both together. Reference is made to the demand / supply imbalance as well constraints impacting our clients' ability to attract and retain relevant engineering skills.

Our emphasis is on the short term skills shortage as we deal with the “here and now”, but interaction with employers has also given us insight into their longer term employment plans and their concerns about future skills availability and difficulties in retaining their existing staff.

As far as “the nexus between the demand for infrastructure and the shortage of appropriate engineering and related employment skills in Australia” is concerned our response focuses on the point in the terms of reference relating to “options to address the skills shortage for engineers” and our submission offers recommendations specific to either short or long term issues. Our submission goes on to indicate how these recommendations may contribute to the establishment of “effective strategies to develop and retain engineering talent in the private and public sectors”.

This submission does not report on any detailed study of the problem of engineering skills shortages. It merely serves to reflect on current efforts, opinions and issues relating to this topic, while offering an insight into how consultation with those involved in the recruitment sector might enhance the effectiveness of current and future strategies, and encourage pragmatic rather than ideological solutions.

## **Current Observations: recruitment experience as it relates to short term demand and supply**

According to the latest edition of the “*Employment Outlook for Engineers*” published by the Department of Education, Employment and Workplace Relations, most of the engineering labour force is deployed in the “Professional, Technical and Scientific services industry” (often simply referred to as the “consulting industry”), followed by manufacturing and then only mining and construction, and employment in the consulting, construction and mining industries was proportionally higher in Western Australia than for Australia as a whole. *(Note that manufacturing industry typically employs engineering staff on a long term basis – not cyclic as in mining and resources projects – they do not often use services from the consulting industry therefore contribute little in terms of cyclic skills needs in consulting. Also noted is that the while proportion of employment in the mining sector appears small. This is because the ABS statistics used by DEEWR for this category do not reflect the actual number of engineers working indirectly in that industry - many via the aforementioned consulting industry).*

Our own recruitment statistics confirm the above trends, particularly on account of the extent to which we are being engaged by engineering services companies such as EPCM and engineering consulting firms. Furthermore the skills profile of candidates in demand show that the emphasis is presently on construction and implementation activity in the resources and infrastructure sector (although we are seeing early signs that operator / owner companies in the resources sector are stepping up their recruitment of engineering skills as they anticipate projects coming on line. Operations and maintenance activity is less cyclic so as it grows this demand is likely to be sustained longer than project phases).

We have observed that the difficulty in recruiting engineers with typically 14 to 17 years experience has been a particular frustration to employers in all industry sectors and this has been a key driver in continued demand for migrant engineers. We have also noted a tendency for companies to send FEED and design work offshore where this level of engineering remains accessible and affordable

It is worth noting that these trends in short term skills shortages are also supported by the Engineers Australia Salary and Benefits Survey 2010 whereby 62% of respondents to the survey experienced a skills shortage over the preceding 12 months – an increase on the previous year's figure of 53%. Respondents also indicated that level 3 engineers (typically 14 to 17 years experience) resulted in the highest levels of recruiting difficulties.

### **Emerging trends in the demand for engineering skills – Long Term Skills Shortage**

Engineering activity in Australia is about delivering projects, about design, planning and construction directed towards the ongoing effort to exploit Australia's vast mineral wealth. The demand for new civil infrastructure that supports our population is also driven by this activity. As a result the state of and outlook for the consultants who serve the building and construction of projects emerging from this effort provide a meaningful barometer of the trends we are interested in.

Given the dominance of the "Professional, Technical and Scientific services industry" in the makeup of the engineering labour force it would be appropriate to note where most capital expenditure is being directed and what the forecasts are for the next five years or so.

Consult Australia represent consulting companies that provide professional services to the built and natural environment. Their Economic Forecast for Consulting Firms covers all industry sectors and is based on a data sample of small, medium and large engineering firms. Their data shows where the money is being directed and which industries engineering consultants are most active in, now and in the future. Their report ("2011 Outlook – An Economic Forecast for Consulting Firms in the Built and Natural Environment") clearly reflects the impact of work directly associated with mining and resources – and confirms growth in all sectors, with mining and heavy industry likely to continue rapid growth until 2014.

A large proportion of JSM Appointments' clients design and deliver projects in the government utility and civil infrastructure industry. The above trends represent a significant challenge for these employers. Whether their infrastructure projects are directly resource based (mining plant, LNG facilities, ports etc) or civil based (rail, power, water etc), the profile of engineering skills that they all require are similar.

We note two critical patterns that have emerged from these trends and the general outlook:

1. Competition for skills with 14 – 17 years experience is at an unprecedented level. Our insight into engineering teams in various industry sectors reveals some disturbing consequences of this aspect of the skills shortage, namely:

- a. Persistent vacancies at Senior / Lead engineer level threaten project delivery.
  - b. A growing dissatisfaction among existing senior and lead engineers who become frustrated at their inability to deliver on their outputs and commitments due to lack of skills.
  - c. Acute shortages of mentors for entry level engineers and graduates. This is caused both by a lack of more senior engineers and a lack of time to administer training and mentorship among those that exist.
2. Lack of suitable engineering graduates from Australian higher education institutes. This problem is being exacerbated by the following issues:
- a. Existing graduate programs run by larger employers are being undermined by high turnover with disgruntled graduates often seeking better mentorship opportunities with other employers. Graduate programs in large firms (i.e. those able to afford formal graduate training programs) tend to be somewhat inflexible making it difficult to replace graduates until the next cycle of recruitment normally up to a year later.
  - b. Also attractive are the higher salaries on offer in a competitive market, so job hopping is rife and this disrupts the continuity of graduate training episodes.
  - c. To make matters worse competing firms often offer higher level roles to inexperienced graduates just to lure them into their organisation. This has consequences in terms of the development and training of graduates and subsequently the quality of our engineering skills in the long term. Of course this will also diminish productivity, increase the risk of safety hazards and lower standards and quality of workmanship.
  - d. Ironically many recent graduates struggle to find employment! The skills database of JSM Appointments (and likely those of other engineering recruiters) is over populated with recent graduates that have been unsuccessful in getting on the graduate programs of large employers. They may not have disciplines that were in demand when programs were developed (such as civil / structural engineers), or perhaps missed the recruitment cycle while having to repeat one or two outstanding university credits (see 2.a. above). Whatever the reason these unemployed graduates often end up moving into alternative careers or land jobs in smaller firms who exploit their basic technical attributes, but often do not have the means (or inclination) to support their training towards acquiring professional engineering status via the Engineers Australia accreditation process (see also 2.c above).

### **Suitable strategies for the longer term**

**Higher Education and Vocational Training:** There is broad consensus that we have a challenge on our hands, and a significant amount of effort already goes towards attempts to achieve a better understanding of the nature of the engineering skills shortage, and to derive solutions for the now and the long term. Notably the Australian National Engineering Taskforce (ANET) has been formed to address the skills shortage in Engineering and a number of publications have been released which mainly comment on building engineering capacity through education and training.

ANET makes some meaningful proposals that should be considered when adopting strategies for addressing the engineering skills shortage in the longer term, particularly with respect to securing better pathways from Vocational Education and Training (VET) to Engineering degrees as an effective way of boosting the professional team.

**Graduate Training Programs:** An area that may still need to be addressed is the issue of graduates unable to secure suitable employment (cadetship) to meet their training requirements for Professional status in accordance with Engineers Australia. This includes Australian residents as well those on “recognised graduate” visas – these qualified but inexperienced engineers are not only a source of manpower (to boost technical project teams in the short term) but we are also at risk of them leaving the profession in search of other employment opportunities (long term impact).

The recruitment industry may offer a solution in this area. Engineering recruitment agencies could adopt recognised training regimes of their own that involve rotating graduates among different clients (participating employers). These participating employers would typically be small to medium size organisations that do not have recognised graduate training programs, but can still offer suitable on-the-job training to fulfil at least part of the overall training requirements for each graduate. The recruitment firm would be responsible for ensuring that each registered graduate receives the variety and level of training required to meet his accreditation criteria and acquire professional status.

This would offer affordable skills to participating employers, while protecting the long term interest of graduates. It will go a long way to keeping more young engineers in the profession and improving the quality of future engineers. Many small companies are run by experienced engineers so such a scheme would also help to fill the gap in available mentorship mentioned above.

Participating employers may only get to have a particular graduate on board for a limited period of say 3 to 6 months while he or she completes that section of training before being rotated to another employer, but that resource can be replaced by another graduate on the program, and participating employers would have the opportunity to assess different engineers for possible future employment.

Such an initiative would of course require funds and/or suitable incentives for engineering recruiters or labour hire companies to undertake such an effort. These could perhaps be provided by way of government grants or tax incentives to recruitment or labour hire firms on condition they are able to submit approved training regimes accredited by Engineers Australia.

**Regulation of the Profession:** We come across many companies grappling with issues of qualifications and required competencies for various job functions. This is most apparent as employers attempt to redefine the roles and responsibilities of their limited resources to make better use of the existing talent in their organisations, and also review selection criteria of vacancies to make them accessible to a wider pool of talent in the market.

For instance reviewing qualifications requirements may increase the pool of available talent for a particular role (function). However progress in this area is often impeded by confusion surrounding appropriateness and relevance of various qualifications in relation to required competencies. More effective (and nationally consistent) regulation of the Engineering Team may improve succession planning and the availability of skills by better exploiting the relationships between different occupational categories within the engineering team.

A brief discussion of the regulation of the engineering profession and implications for skills availability is presented in Appendix A. This is an excerpt from a submission submitted last year relating to the *Discussion Paper: the Regulation of Engineers in WA* (released in June 2009). The Government of Western Australia and Engineers Australia Western Australia Division jointly prepared the discussion paper, with input from other professional engineering associations including the Association of Consulting Engineers Australia (ACEA), Association

of Professional Engineers, Scientists and Managers, Australia (APESMA) and the National Engineering Registration Board (NERB).

### **What can be done now? Strategies for the shorter term**

Strategies being mooted and proposed by ANET and others may be effective in addressing local (Australian) skills shortages in the longer term. In the short term however, impacts of the project based characteristics of our industry merely reflect persistent global economic activity in terms of supply and demand for mineral and energy resources. Consequently Australia is competing with the rest of the world for the type and level of engineering talent required right now.

With respect to experienced engineers shorter term solutions seek answers predominantly in a review of immigration policy. Our observations while recruiting engineering skills since 2004 find that:

- The demand for engineering skills, particularly professional engineers, is not being met by any noticeable growth in experienced engineers emerging from the flow of local graduates.
- The number of skilled migrants we recruit exceeds the supply of graduates in Australia by a significant margin and permanent migrant engineers are almost exclusively degree qualified. Inconsistencies in Australia's regulation of the engineering profession together with inappropriate migration qualifying criteria for different engineering occupations means we are missing an opportunity to tap into a larger market of available engineering skills in other categories (inclusive of engineering technologists and engineering associates).
- Our observation has been that while all skilled migrants initially join the engineering labour force, skilled permanent migrants' participation rate is similar (perhaps marginally lower) than for Australian graduates. Temporary migrants obviously enjoy a 100% participation rate and these numbers are driven by employer demands and therefore more accurately reflect supply versus demand trends. In other words it reflects the extent to which employers respond to reduced demand for engineers, and confirms the demand / supply imbalance.
- Most employers attempt to meet short term skills shortage requirements through employer sponsorship (we have noted that new migration policy reflects a shift towards demand side visa program allowing employers to respond to short term skills shortages through temporary migration (457 visas), while permanent skilled migration now reflects a policy of targeting longer term labour market requirements and the capacity of the education system to meet long term needs). In terms of our ability to compete for scarce engineering skills though we need to recognise that a 457 visa offers very limited appeal to expatriate engineers seeking work in Australia.
- We see the need for more efficient visa processing that allows more discretion on the part of the employer who, after all, best knows what qualifications and experience is or is not suitable. We have been witness too many cases whereby good skills have been lost to our clients as a result of visa processing bottlenecks, inexplicable queries from DIAC on relevance of experience, trivial salary queries and so on. Also the removal of many recruitment firms ability to sponsor on-hire workers through the 457 visa program has restricted the access of many smaller firms to overseas skills.

**Migration Visas:** Australia's migration program needs to be streamlined and made more attractive to expatriate workers. This is essential for employers to effectively compete for and recruit global talent that can (temporarily if necessary) be brought into Australia to meet the

skills gap (engineers with 14 – 17 years experience) on current projects and also contribute to the mentorship of new graduates.

**A possible solution** could be the introduction of a new visa class with tax incentives for expatriate engineers temporarily working in Australia. For example allowances for employers to pay tax free gratuities at the end of a successfully completed contract. This visa could have strict conditions attached such as a requirement expatriates to leave after a specified period unless they are able to obtain a permanent resident visa via the skilled independent migration program.

Under such a program some expats will be happy to work here, enjoy the financial benefits of a tax free bonus while contributing to the delivery of projects, transferring their skills and knowledge to Australian graduates and generally relieving the short term skills shortage. Others may elect to stay permanently, a decision they may otherwise not have taken had they not been afforded an opportunity to experience living in Australia. Those electing to remain will of course help ease shortages for the longer term.

## **Conclusion**

There is a common theme that emerges when discussing the longer and shorter term threats to skills availability: The skills shortage being driven by a sustained peak in the resources and infrastructure project cycle is not only threatening the delivery and cost of current projects, but also restricts the availability and quality of engineering skills in years to come.

The ongoing pursuit of efforts to address education, training etc must continue; however strategies emerging from these efforts will be severely impeded if Australia does not address the short term issues in the meantime. What is needed now is urgent action to:

- Increase international access to experienced engineers (those with 14 – 17 years experience)
- Improve the participation level of new and recent engineering graduates.

## **About JSM Appointments**

Founded in 2004, JSM Appointments is a Perth based organisation that specialises in engineering recruitment and HR consulting services associated with the broad range of functions and capabilities of the Professional Engineer, Engineering Technologists and Engineering Associates that make up the engineering team in Australia.

[www.jsmapointments.com.au](http://www.jsmapointments.com.au)



## Appendix A: Regulation of the Profession

The following submission relates to the *Discussion Paper: the Regulation of Engineers in WA* jointly prepared by The Government of Western Australia, and Engineers Australia WA Division (*Submitted by John Masters – October 2009*).

A registered Engineering Technologist I have more than 25 years of design and project experience in the electrical engineering discipline. I am a member of Engineers Australia, and also a registered Professional Technologist with the Engineering Council of South Africa. My engineering experience spans several industries both in South Africa (15 years) and Australia (10 years).

I am currently a director of an employment services firm that specialises in the referral of engineers, technologists and associates, and during the past five years I have been extensively involved in the recruitment of engineers for companies in various industries across Australia.

My interest in the proposal for the regulation of engineers in WA is twofold: from a professional point of view as a Technologist I am concerned about the potential impact regulation may have on the careers of various members of the engineering team, while **as a supplier of employment services I believe there will be implications and opportunities with respect to access to and availability of engineering skills.**

- As an Electrical Technologist I support a regulatory system that retains appropriate recognition for the skills and competency standards attributed to this occupational category. For the most part my engineering career has been unimpeded as long as I was able to back my technologist qualifications with knowledge and competence in my field of expertise. However I am concerned that the introduction of a regularity system that excludes Technologists may effectively force me and many others out of a profession for which we are qualified and experienced.
- My observation in the recruitment industry is that the absence of regulation of the engineering profession leads to confusion surrounding appropriateness and relevance of various qualifications in relation to required competencies. This impedes the optimum use of available skills and resources. On the other hand regulation of the Engineering Team may improve succession planning and the availability of skills by exploiting the relationships between different occupational categories. For instance, some technologists may be content to remain at a certain level, while study assistance and training can be provided for those that want to articulate to the level of engineer. This provides an alternative resource from which to develop future engineers – many of whom will already have organisational and technical experience when they articulate.
- Regulation is likely to have an impact on international mobility and consistency with our trading partners as well as countries where mutual recognition of engineering qualifications has been established. This is particularly important when considering the inclusion of all three occupational categories, in line with what happens in many overseas countries.
- I believe that an appropriately designed regulatory system will encourage the introduction of changes in industry and organisational structures that better reflect the defined roles of different occupational categories. This in turn will promote better use of scarce professional resources; raise professional standards and increase consumer understanding and confidence in the engineering profession.