

20 January 2012

The Committee Secretary  
Senate Education, Employment and Workplace Relations Committees  
Parliament House  
Canberra ACT 2600

**Re: The shortage of engineering and related employment skills**

The Secretary

I am writing to you in response to the Senate inquiry into the shortage of engineering and related employment skills in Australia. Auto Skills Australia (ASA) is pleased to provide input to this important matter and would welcome feedback from the committee on the issues raised in this submission.

Auto Skills Australia is the national industry training advisory body for the automotive industry, which includes automotive manufacturing and the retail service and repair sectors. ASA is responsible for the development of nationally endorsed qualifications for the automotive industry and for reporting to government on skills and labour needs in the industry and forecasting future skill demands.

In reflecting on the skills shortages facing the engineering professions, ASA recognises the negative effects this can have on industry broadly and also on the overall skill capacity of the nation. The automotive industry has suffered severe skill shortages across several of its key trades for some time and is in agreement with many of the research findings that have emanated from the inquiry.

This submission reflects a number of key issues for automotive occupations that can lead to engineering job roles and, in particular, those relating to skill shortages and increased labour gaps appearing as significant numbers of older workers leave the workforce over the next decade.

ASA has drawn on several resources to help inform its views and particular reference has been made to the recent research projects undertaken by the Australian National Engineering Taskforce (ANET).

One of the key issues facing a range of industries in Australia is how to maintain a balance between the supply of skilled labour and the needs of the workplace. This critical balance becomes even more difficult where labour needs fluctuate outside the normal labour demand cycles and where the training of people to meet these needs cannot be achieved quickly.

In the case of engineering, multiple road and rail infrastructure projects have placed additional demands on an occupation that requires more highly skilled professionals than are available in the local market. Projections show that significant numbers of older workers will leave the labour market over the next decade, thus further increasing the burden on industry to find additional skilled professionals in an already tight labour market.

Given the forward estimates for labour requirements in industries that rely heavily on engineering professionals, there is an urgent need to encourage more people into the profession through a multitude of pathways. Existing engineering workers also need to be retained longer to maximise the training effort of industry and to provide support for new personnel entering the workforce.

Many industries in Australia, including automotive, face engineering skills shortages. All are seeking ways to add more workers to their ranks through attraction and retention strategies in their specific sectors. However, the limited labour pool in Australia creates an environment where a multitude of industries are all looking to build their skills capability from a very limited pool of new or existing labour.

ASA believes there are several factors that have slowed the supply of engineering-qualified labour. Without a range of interventions, it appears unlikely that market forces will produce the required labour volume. These factors include, but are not limited to, the following.

## **1. Attraction**

*It would appear anomalous that a profession that pays relatively high wages, has a good social standing and the capacity to offer global careers has a skilled labour shortage. While ANET reports clearly articulate some of the challenges facing industry in retaining new and existing engineers, there remains a significant gap between the number of young people electing to enter engineering professions and the broad range of engineering-related jobs that are available in Australia and overseas.*

Compared with many other occupations available to school leavers, road, rail and many other engineering roles can provide a strong platform upon which long-term career options can be based. They can also provide a variety of work that is not found in many other job roles. Although there is clearly fierce competition among industries and occupations to attract new workforce entrants, there appear to be several fundamental issues limiting the supply of students into engineering qualifications.

Research over many years into career choices made by students shows that young people begin making career choices in their early and middle years of schooling. Often the decision-making is not focused on the career a student will pursue, but rather the careers they will not pursue.

What factors are eliminating the engineering professions from students' career decision-making during this formative stage? Additional work is needed to find out why engineering occupations are not ranking highly in young people's career aspirations and what measures can be implemented to turn this around.

This question is not exclusive to engineering. As skilled labour requirements in Australia grow and the available labour pool diminishes with the ageing population, there will be significant pressure across all industries to attract and retain new workers. Competition for the labour pool will be extreme.

*ASA recommends that the inquiry promote further research into understanding the career-making decisions of young and mid-school students as a way to find out why the engineering professions are not attracting enough university entrants to maintain graduate throughputs sufficient to meet industry needs.*

## **2. Educational achievement**

Educational achievement may be acting as a barrier to the attraction of students into engineering and the completion of qualifications. This issue requires further research and analysis.

Given the heavy emphasis on maths and science subjects in undergraduate engineering qualifications, it would seem logical that students seeking to enter these qualifications need to have reasonable capacity in these core areas. However, it may be the case that many students do not possess these skills to the level required for entry or completion of engineering qualifications.

This possibility has ramifications more far-reaching than this inquiry alone, but it may be a factor that is limiting students' progression into tertiary engineering qualifications to a greater degree than is realised.

In making a comparison, many trade occupations lose around half of their apprentice intake over the period of their training. While many apprentices report that they left their employer for reasons such as poor job fit, mobility challenges or conflicting priorities, many also drop out because they cannot meet the literacy and numeracy requirements of their trade studies.

In some cases these skills are deficient to the point that they limit an individual's capacity to complete underpinning knowledge components of their trade qualification. It is possible that poor literacy and numeracy skills are also hampering potential entrants into engineering qualifications and this aspect should be further investigated.

ANET research has outlined several bridging courses that have been developed to assist domestic and overseas students to achieve entry requirements for engineering degrees. In the cases reported, they appear to have had a positive effect and have assisted many students into their chosen engineering specialisation.

However, there remains a lingering question on the sheer volume of students who actually possess the required skills for entry into an engineering degree at the end of their secondary schooling. Is this number reducing or increasing?

*ASA recommends that research is undertaken into the number of students completing secondary education who possess the maths and science requirements for direct entry into an engineering degree.*

### **3. Articulation of courses from VET to higher education**

The articulation of VET to higher education and vocational qualifications is a critical factor in the transfer of students to higher education pathways. As outlined in ANET reports, the key challenges in the transfer of students are issues relating to sector funding, credit transfers between competency-based and curriculum qualifications, and the physical time and effort required to recognise the credit in qualifications across the two sectors.

This is further compounded by highly flexible competency-based VET qualifications, which leave higher education institutions with the task of unpicking qualification contents to ascertain the amount of credit that may be awarded. Sometimes credit elements between courses are so granulised it is difficult for a VET or higher education institution to make a valid call on how much credit should be awarded.

Pragmatically, many higher education institutions appear to have provided block credit between higher-level VET and higher education qualifications. It is assumed this is to provide some degree of surety around credit transfer for students.

However, this model can work against students who have completed units of competency that closely match the content of a higher education engineering qualification, and provide a bonus for students who have completed the same qualification but with a less favourable alignment of competencies.

The number and scope of engineering diploma and advanced diploma qualifications may also weaken the desire of higher education institutions to formalise multiple credit transfer arrangements between VET and higher education qualifications, given the potential workload in making individual assessments based on differing qualification content.

Ultimately, improved articulation and credit arrangements can be achieved through a narrowing of elective choices in underpinning VET qualifications. Key engineering units of competency that have high transfer credit value could be placed into the core components of vocational engineering qualifications.

VET or higher-level engineering qualifications that have major variations in their content have the capacity to weaken consistent credit transfer arrangements and can potentially confuse the marketplace for people seeking to enter engineering through vocational qualification or credit pathways.

In order to minimise conflicting credit transfer arrangements ASA believes that state-accredited courses should be closely examined by the new national VET regulator with a view to combining them into nationally endorsed training package qualifications.

*ASA suggests that it would be a great assistance to potential engineering students if RTOs could provide clearly articulated credit arrangements before students enrol in VET engineering qualifications. There may also be similar value to spelling out credit arrangements from higher education qualifications into VET qualifications for higher education students who may seek to change pathways or vocationalise their higher education learnings.*

*ASA believes there is a key role for RTOs and universities in the development of national credit transfer agreements that are transparent and easily assessable to existing and potential students.*

#### **4. Bridging qualifications**

There are several bridging qualifications that have been developed to assist students making a transition into higher education programs. ANET research shows many positive examples where domestic and international students have relied on these bridging programs as a key support mechanism in their study pathways.

ASA contends that additional work could be undertaken to develop bridging programs from trade studies, such as automotive, into engineering diplomas and potentially degrees.

The automotive industry knows that a large number of its qualified tradespeople leave the industry, often mid-way through their working lives. While many move into industries such as transport and infrastructure, many also move into unrelated occupations. The loss of these individuals to the industry has a number of negative consequences not least of which is a reduction in industry capability and the non capitalisation of high level technical skills into the broader Australian economy. In most cases there exists a solid trade base upon which higher-level engineering qualifications could be developed.

For many individuals in this transitional group, it has been many years since they were engaged in formal education. These tradespeople have high-order technical skills, but many are likely to have gaps in literacy and numeracy skills, particularly at an academic level.

There is an opportunity here for the qualifications development system to identify the core skills required to cross-train qualified automotive tradespeople into higher order occupations.

The aim of this initiative would be to slow the outflow of mature automotive tradespeople into unrelated occupations and to provide a valuable pathway into engineering professions.

This trade-to-engineering bridging program would need to focus on providing underpinning maths and science skills, plus a refresh of study skills, to prepare learners for a more academic-based environment. While vocational qualifications are focused on skills required for a specific job outcome, the bridging program would need to be recognised as an underpinning qualification that could ultimately lead to a diploma or degree in engineering.

*ASA would welcome the opportunity to work with the Association of Professional Engineers, Scientists and Managers Australia (APESMA) and ANET to develop a bridging qualification that could support the transition of automotive and other tradespeople into engineering occupations.*

In closing, ASA commends the work of APESMA and ANET and the research teams that have provided a wealth of information on the present and future workforce development challenges facing the engineering professions. ASA recognises that projects of this nature encourage new and dynamic thinking around critical industry issues and welcomes the opportunity to make a contribution to that work.

ASA welcomes feedback from the inquiry and will reflect on research generated through this important work to inform future qualifications for the automotive industry, in particular where it has the capacity to extend career paths for automotive personnel.

Yours sincerely,

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Chief Executive Officer  
Auto Skills Australia Ltd