Chapter 7

Workforce and skills

Introduction

7.1 Construction and through-life support for naval vessels in today's advanced technology era requires skilled labour in a range of specialised fields as well as traditional trades. These include design, platform engineering and systems engineering, integrated logistic support, hull and mechanical construction and module fabrication and project management.[1] Workforce availability and sustainability is fundamental to Australia's capacity to build and support naval ships.

7.2 This chapter looks at workforce and skills issues for the naval shipbuilding sector. The chapter discusses skilled labour shortages and the level of employment demand generated by future naval shipbuilding projects. The issues of competition for skilled labour within heavy industry, skills transfer and workforce mobility are reviewed. The chapter then looks at capacity issues relating to particular skill sets—the trades and the high end design, systems integration and project management skills. The chapter assesses the AWD and LHD programs as a case in point with regard to workforce capacity. Finally, the chapter overviews government and industry initiatives to address skilled labour shortages.

Skilled labour shortages

7.3 National skilled labour shortages and the potential impact of such shortages on future labour force supply and productivity have been increasingly recognised in recent years. In 2003, the Senate Employment, Workplace Relations and Education References Committee conducted an inquiry into current and future skills needs. The committee found:

> The overarching message during the inquiry was the need to recognise that Australia is facing a major skills formation challenge, both in the immediate future and accelerating over the next two decades, due to the combined effect of a shrinking cohort of young workforce entrants, a depleted stock of skills in some key industries and occupations and the accelerating need for new skills, flowing from technological and business process change.[2]

7.4 The Department of Employment and Workplace Relations (DEWR) has responsibility for monitoring skills demand in Australia. DEWR defines skill shortages as follows:

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1 Department of Defence, *Submission 20*, p. 14.

2 Senate Employment, Workplace Relations and Education References Committee, *Bridging the skills divide*, November 2003, pp. 3–4.

> Skill shortages exist when employers are unable to fill or have considerable difficulty in filling vacancies for an occupation, or specialised skill needs within that occupation, at current levels of remuneration and conditions of employment, and reasonably accessible location.3

7.5 DEWR has identified that all states are currently experiencing skills shortages in a number of trade occupations relevant to naval shipbuilding, including metal machinists, sheet metal workers and electricians.[4] In addition, there are state-wide shortages in all but one or two states in several other relevant engineering and electrical trades, including metal fitters, metal fabricators and welders.[5]

7.6 Skills shortages in the engineering sector have been apparent for some time. In 2001 the Engineering Working Group of the National Industry Skills Initiative reported that:

> High levels of shortage were identified across the three engineering streams of mechanical, fabrication and electronic. Shortages are particularly severe at the higher trade levels of electronic engineering, and welding skills, tool making, and in computer aided design and machining, and in the use of computer numerically controlled processes.[6]

7.7 Factors thought to influence engineering skills shortages included the:

- cyclical patterns of the main employing industries, such as manufacturing, construction and transport sectors;
- pace of technological change, rendering some skills obsolete and making others critical;
- changes in the sources of skilled labour, with privatisation of public utilities reducing the traditional training ground and supply of skilled engineering labour;
- high labour mobility, which can make it difficult for smaller firms and trade exposed sectors to compete with the financial rewards offered by larger firms. High labour mobility can also be a disincentive for firms to invest in long-term training; and

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3 DEWR, *Skills in Demand Lists State and Territories—2006,* p. 39.

4 DEWR, *Skills in Demand Lists State and Territories—2006,* p. 39. www.workplace.gov.au/NR/rdonlyres/BF83E4CC-1E8F-4630-95C7D9F3A6108A9A/0/SkillsinDemandMarch2006.pdf, (accessed 19 May 2006).

5 DEWR, *Skills in Demand Lists State and Territories—2006,* www.workplace.gov.au/NR/rdonlyres/BF83E4CC-1E8F-4630-95C7D9F3A6108A9A/0/SkillsinDemandMarch2006.pdf, (accessed 19 May 2006).

6 National Industry Skills Initiative, Engineering Working Group, 2001, *Engineering Skills Shortages,* p. 4.

- the ageing workforce, resulting from a decline in the number of young people entering the engineering trades.[7]

7.8 Skills shortages are already affecting defence industry. A defence industry survey undertaken in 2003 found that 40 per cent of businesses had been significantly constrained by a shortage of senior managers, 58 per cent by a shortage of professional staff, 48 per cent by a shortage of associate professionals and 67 per cent by a shortage of tradespeople.[8]

7.9 While the above survey indicated the extent of skills shortages experienced by defence industry generally, it is difficult to gain a clear assessment of the extent of direct skills shortages in naval shipbuilding. The committee is cognisant that in a competitive tender environment, companies would be reticent to disclose publicly any concerns about their ability to attract and retain labour.

7.10 Austal, which operates in a niche market and not in competition with the major steel builders, did comment directly on the effect of skilled labour shortages. Mr John Rothwell, Austal Ships' Executive Chairman, advised that the shortage of skilled labour is the company's biggest challenge. Despite committed endeavours, such as training programs, profit sharing and other employee satisfaction programs, attrition remains a factor, with a staff turn over rate of around 30 per cent.[9] Mr Rothwell commented that the company would currently prefer to have 'an extra couple of hundred people' and that its ability to take on new projects is restricted by workforce availability.[10] Without a significant increase in the availability of skilled labour, Austal considered that pressure on wages and continued loss of skilled labour may jeopardise Australia's competitive advantage in aluminium shipbuilding.[11]

Naval shipbuilding—workforce demand

7.11 Defence has estimated the size of the expected workforce demand resulting from its planned naval acquisition program. Figure 1 presents Defence's estimates of the total workforce needed to support naval ship construction, upgrade and in-service support for the period 2005 to 2025, if all upcoming projects were managed in country.[12] There is a sharp rise from 2008 to 2012, reflecting the additional workforce needed for the AWD and Amphibious (LHD) and Afloat Support projects. According to Defence's estimates, this increase in demand would require the naval shipbuilding

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7 National Industry Skills Initiative, Engineering Working Group, 2001, *Engineering Skills Shortages*, pp. 11–13.

8 ACIL Tasman, November 2004, *A Profile of the Australian Defence Industry*, p. 18.

9 *Committee Hansard*, 3 April 2006, pp. 63–65.

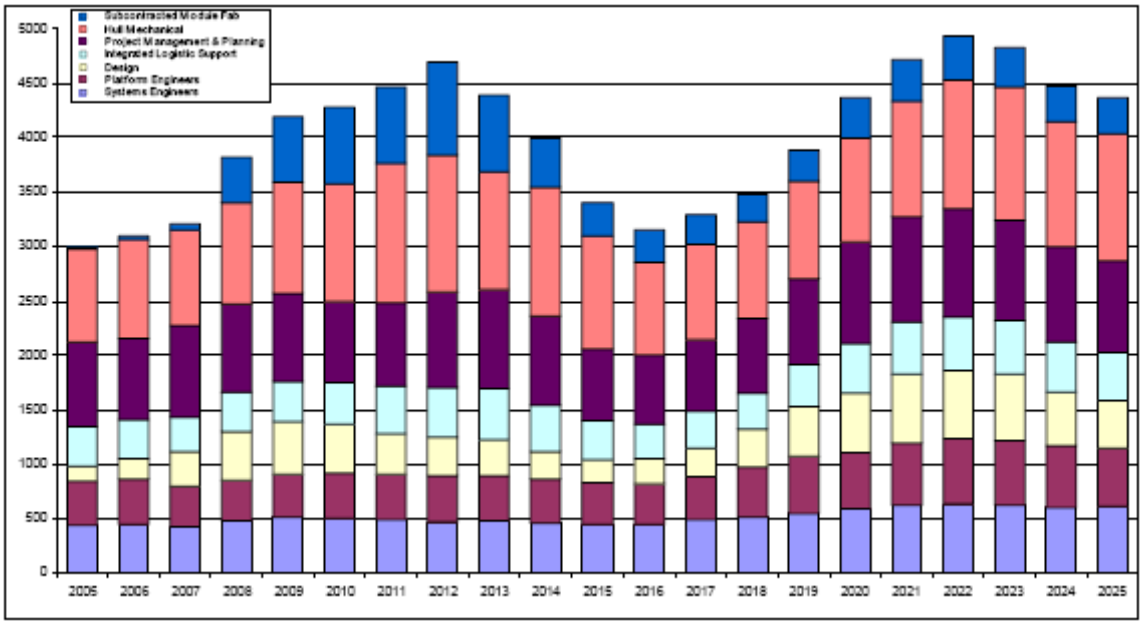
10 *Committee Hansard*, 3 April 2006, p. 65; Austal Ships, *Submission 7*, p. 9.

11 Austal, *Submission 7*, p. 9

12 Department of Defence, *Submission 20A*, p. 6.

workforce to expand from around 3000 people in 2005 to a peak of 4700 in 2012, around a 57 per cent increase.[13]

7.12 Following a marked trough in demand around 2013 to 2016, a second rise is projected for 2017 to 2022. While the current Defence Capability Plan extends only to 2016, Defence anticipates that it will require a replacement Frigate and Submarine program from about 2018 onwards and has included these programs in the workforce estimates.[14]



Estimated total workforce requirements, by skill sets.[15]

7.13 The coming demand for workers in the naval shipbuilding industry varies across different skill sets. Defence estimates that the majority of the workforce increase will be required in hull and mechanical construction and module fabrication, with demand increasing from around 900 workers in 2005 to around 2100 in 2011.[16] Demand for designers is also projected to be significant, increasing from a relatively small base of around 140 in 2005 to 490 in 2009.[17]

7.14 The predicted peaks and troughs in demand for naval shipbuilding workers in the coming decades principally reflect peaks and troughs in major construction and upgrade work. The requirement for construction and upgrade workers is estimated to double over the five years from 2008 to 2012, with commencement of construction of

13 Department of Defence, *Submission 20A*, pp. 6–7.

14 Department of Defence, *Submission 20A*, p. 1.

15 Department of Defence, *Submission 20A*, p. 6.

16 Department of Defence, *Submission 20A*, pp. 6–10.

17 Department of Defence, *Submission 20A*, p. 8.

the AWDs and LHDs.[18] The workforce required to provide in-service support to the RAN's fleet is projected to remain relatively stable over time, at around 1700 to 2000 workers.[19] In-service support for the submarines accounts for around two-thirds of this workforce.

Sustainment workforce

7.15 Defence emphasised throughout the inquiry that, from its perspective, the primary reason for an Australian naval shipbuilding industry is to ensure that there is a sufficient indigenous capability to support the fleet through life. To this end, Defence estimated the workforce needed to meet its 'sustainment requirements'. That is, the workforce required to 'maintain, upgrade and modify the Naval Fleet to the required operational capability levels'. Defence explained that the sustainment requirement includes 'all of the in-service support workforce plus a proportion of the construction workforce that will need to be retained and used to support the new ships once they enter service and to address attrition within the in-service support workforce'.[20]

7.16 Sustainment requirements vary across skill sets:

> …only a proportion of the naval construction workforce needs to transition into the in-service support workforce to meet operational requirements. The proportion of skills to be transitioned depends on the nature of the skills. System Engineering…and Platform Engineering…represent specialist, high-end skill categories that are fundamental to retaining the operational capability of the naval fleet. As such, Defence would seek to retain a higher proportion of these skills. Design,…Integrated Logistic Support…and Project Management/Planning,…whilst important skills, are not required for sustainment purposes at the same proportions as the high-end specialist skills. Hull and Mechanical Construction…and Subcontracted Module Fabrication Skills, whilst critical for construction, are not required at high-levels for in-service support and capability sustainment.[21]

7.17 Overall, Defence estimated that it needs only around two-thirds of the total projected workforce to meet its ongoing sustainment needs. Therefore, without further indigenous construction projects, Defence sustainment work is unlikely to generate sufficient work for an expanded naval shipbuilding workforce. This analysis is informative regarding Defence's aggregate, ongoing workforce requirements and helps ensure that debate about workforce capacity is not focussed only on the construction phase of major projects. However, sustainment of the RAN's overall fleet capability will inevitably involve replacement programs into the future. If any or all such construction work is to be conducted in Australia, then the 'sustainment' level workforce will need to be expanded again in time.

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18 Department of Defence, *Submission 20A*, p. 3.

19 Department of Defence, *Submission 20A*, p. 5.

20 Department of Defence, *Submission 20A*, p. 7.

21 Department of Defence, *Submission 20A*, p. 10.

Other industry sectors—competition or support?

7.18 A range of skills used in the naval shipbuilding sector is also relevant to other industry sectors. Therefore, the capacity of Australia's workforce for naval shipbuilding cannot be viewed in isolation from other sectors. The committee received different views about competition for skilled labour and transferability of skills across sectors. Some witnesses suggested that competition for labour resources might reduce Australia's capacity for naval shipbuilding, while other witnesses considered that there was potential to draw labour from other sectors of the economy to address peak periods of shipbuilding demand.

7.19 Given identified skills shortages and the demand for skilled labour in other industries such as mining, natural resources and construction, Defence commented that there is a risk that industries within Australia will end up competing for the limited skill sets available.[22] Such competition may make it difficult to secure necessary labour and may drive up wage rates, increasing the cost of construction projects. Defence also indicated that the effect of a sustainable naval shipbuilding industry on other sectors of the economy should be considered, particularly as the mining and construction industries are 'currently managing projects that are key to the wealth generation for Australia'.[23]

7.20 The Department of Industry, Tourism and Resources (DITR) analysed the workforce requirements of offshore petroleum developments currently committed or likely to proceed. DITR noted that the estimates were based on 'very approximate data' and provided 'rough order of magnitude calculations'. The results showed that the employment demand generated by offshore petroleum and LNG projects is likely to peak slightly ahead of peak naval shipbuilding demand. However, the employment demand created in the offshore resource sector was estimated to be far greater than the demand generated by naval shipbuilding projects. Upcoming shipbuilding projects were estimated to generate employment demand in the order of several thousand workers overall. In contrast, DITR estimated that the possible employment demand created by offshore resource projects may peak at around ten thousand workers.[24]

7.21 Mr Ken Pettifer, Head of Manufacturing, Engineering and Construction Division, DITR commented that:

> Availability of skills is an issue that will have to be managed, and there may be risks to the naval shipbuilding projects if all the possible resource projects go ahead.[25]

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22 Answers to questions on notice, Attachment A, p. 1.

23 Department of Defence, answer to question on notice, 28 March 2006 (received 29 May 2006), p. 41.

24 DITR, *Submission 38*, p. 4.

25 *Committee Hansard*, 3 July 2006, p. 71.

7.22 Some sources suggested that naval shipbuilding construction, with peak demands around 2009 to 2013, may coincide with a downturn in construction activity in the resources sector. Mr Terence Booth of Challenger TAFE in Western Australia and Mr Jamie Mackaway of the Western Australian Department of Education and Training, advised the committee that demand for construction workers within the resources sector had already reached a peak level.[26] Mr Booth commented that many apprentices trained for the resources industry may become available to the shipbuilding industry in the future.[27]

7.23 Tenix also said that the pressure of skills shortages was likely to lessen:

> One commonly held view is that the current shortage is largely attributable to activities in the resource sector, especially in the construction of new mines and so forth. Over the next five years or so much of that activity will complete, and although there may still be a shortage of workers in Western Australia, the magnitude of the shortage may shrink considerably.[28]

7.24 However, Mr John Rothwell, Executive Director of Austal, had a different view:

> Whilst the demand for resources continues to be what it is at the moment—and it is difficult to see that slowing down although no-one can really tell—it is almost certain that mining companies will find reasons to develop mining sites and offshore gas facilities and of course oil will continue to happen…[29]

7.25 A 2004 ACIL Tasman assessment of labour availability found that among key occupations such as structural steel and welding trades, metal fitters and machinists, electricians and engineering professionals, the workers in naval shipbuilding form a small proportion of all workers in those occupations.[30] Therefore there may be potential to draw labour resources from other sectors of the economy into naval shipbuilding if required.

7.26 A later, 2006, ACIL Tasman report tempered these findings:

> This is not to suggest that the impact of the proposed naval shipbuilding program would not place a constraint on the supply of appropriate skills. There will be geographic issues and naval specific training requirements that may constrain supply in critical periods.

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26 *Committee Hansard*, 3 April 2006, pp. 54, 60–61.

27 *Committee Hansard*, 3 April 2006, p. 50.

28 Tenix, *Submission 26*, p. 6.

29 Mr John Rothwell, Executive Chairman Austal Ships, *Committee Hansard*, 3 April 2006, p. 66.

30 ACIL Tasman 2004, *Skill shortages and the amphibious ships project, Report prepared for the Australian Shipbuilding Advisory Group,* in ACIL Tasman, February 2006, Naval Shipbuilding in Australia, A background briefing, Attachment to South Australian government, Submission 9, p. 34.

> However the table suggests that, on the face of it, there is a base resource of skills in the Australian workforce on which support for the naval shipbuilding program could be drawn. The critical issues are whether the available skills match the needs of naval shipbuilding, how those skills will be mobilised, the nature of additional training that may be required and the competing demand for those skills from other sectors of the economy. The last issue will have implications for their cost.[31]

7.27 This report also stated:

> While previous analysis indicates that the level of demand that the naval shipbuilding program will generate for each relevant skill set is small compared to total number of skills available, the strength and quality of the available skills will continue to be an issue for policy makers and industry.[32]

7.28 Several submitters argued that the naval shipbuilding industry was well placed to secure labour resources, even in a competitive environment, with attributes such as job security not always found in other sectors. Tenix stated:

> …many skilled workers—particularly older members of the trades, who have family responsibilities—are often more inclined to seek out jobs that offer permanence, stability and balanced quality of life rather than simply following the highest wage. Long duration projects such as construction of major naval vessels are ideally suited for those workers.[33]

7.29 Similarly, Thiess commented on the benefits provided by naval shipbuilding employment:

> Naval programs have lead times of at least 18 months to recruit, train and grow a particular skill that can be used for several years on the same program. That provides a stability of jobs unknown in the commercial world. In addition, most jobs in the naval domain are to be provided in large cities rather than in remote sites where most resource projects tend to be constructed. A naval program therefore would be quite attractive to a work force and their families who otherwise may be living/working in remote locations.[34]

7.30 The AMWU also commented on the attraction of stable employment, noting that 'obtaining employment in a place like Williamstown and staying there for

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31 ACIL Tasman, February 2006, Naval Shipbuilding in Australia, A background briefing, Attachment to South Australian Government, *Submission 9*, p. 33.

32 ACIL Tasman, February 2006, Naval Shipbuilding in Australia, A background briefing, Attachment to South Australian Government, *Submission 9*, pp. 35–36.

33 Tenix, *Submission 26*, p. 6.

34 Thiess, *Submission 22*, p. 10.

10 years with good earnings, continuity and job security is what young people are looking for'.[35]

7.31 In terms of future labour supply, Defence acknowledged that there is some cross over to naval shipbuilding from trade workers in other sectors, but commented on the difficulty of modelling cross industry impacts. Rear Admiral Trevor Ruting told the committee:

> What we predominantly rely on…is the industry, in their tender responses, doing that detailed skills analysis and identifying what they believe is the availability of skills particular to that geographic area and their capability to deliver.[36]

7.32 It is therefore important for DMO to have the skills and industry knowledge to realistically assess tenders, both in the context of labour supply for specific projects and the wider labour demands occurring in the broader heavy industry sector.

Transferability of skills

7.33 In the context of competition for skilled labour resources, transferability of skills between heavy engineering sectors is an important consideration. Many witnesses were confident that naval shipbuilding workers could transition to other sectors in periods of low demand. Challenger TAFE representatives commented that the apprentices and trainees being trained for the naval shipbuilding sector in Western Australia, would be equally employable in commercial shipbuilding and other heavy construction.[37] Thiess stated:

> …the 2 naval programs represent only a small fraction of the trades people required. Therefore, at the end of the programs, they can be employed in the mineral resource sector or other industries, keeping the skills fully utilised until the next shipbuilding program or until another peak linked to a major refit is reached.[38]

7.34 There was more debate regarding the ease of transition into naval shipbuilding from other industry sectors. The committee heard that the skill requirements for naval shipbuilding are not always directly transferable from other industries. Complex defence industry construction may require further upskilling through external courses and practical on the job training. As discussed in chapter 2, in many areas military standards are higher than for commercial production and it can take many years to develop a detailed knowledge of naval shipbuilding rules and standards.

7.35 A Defence Industry Survey in 2003 found that among companies doing business for Defence, defence-specific knowledge and skills were important,

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35 Mr Pat Johnston, National Organiser, AMWU, *Committee Hansard*, 28 June 2006, p. 52.

36 Rear Admiral Trevor Ruting, *Committee Hansard*, 28 March 2006, p. 24.

37 Mr Terence Booth, Challenger TAFE, *Committee Hansard*, 3 April 2006, p. 55.

38 Thiess, *Submission 22*, p. 10.

particularly for professional staff. Respondents estimated that, on average, eleven months were needed to train senior managers in required defence-specific skills, eight months were needed to train professionals and five months for associate professionals and tradespeople.[39]

7.36 Mr Booth, of Challenger TAFE, considered that while there was much similarity in the skills required across industries, some of the higher end specialisations within the defence industry (such as weapons systems) were relatively unique. Challenger TAFE representatives considered that industry partnerships are critical to ensuring transferability of skills. This might involve industry personnel coming into the training system to provide training and also lecturers going out into the industry. Austal Ships and Woodside were given as examples where industry personnel are active in providing training.[40]

Workforce mobility—geographic issues

7.37 While many witnesses were of the view that the shortage of skilled labour for upcoming naval ship programs is manageable and relatively small on a national basis, some expressed reservations about the ability of the industry to secure labour in the required locations. For example, Mr Geoff Smith, Director at ADI commented:

> Analysis shows that the added demand on the skilled workforce for both AWD and LHD projects is one per cent of the available skilled workforce in critical trades. Therefore, perhaps the issue is more to do with transportability. Many skilled workers with established homes and families seem disinclined to relocate across the nation, despite high wages for what may be a spike in infrastructure construction work.[41]

7.38 Defence commented that the national assessment of labour shortages was somewhat outdated:

> …when we had a look at the skills issues 18 months to two years ago, there was an expectation that you would have the capacity, for example, in Western Australia to move people from the east coast to the west. The recent data I have is that that is significantly harder now as a result of some of the housing prices—the increases that have occurred recently in Western Australia. Tenix was expecting to be able to move people from its Williamstown operation across to its Western Australian operation, but people are less willing to do that and, if they are, they have to do it at a significant premium. These things are very fluid, and it depends on individuals and their personal financial circumstances.[42]

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39 ACIL Tasman, November 2004, *A Profile of the Australian Defence Industry*, p. 93.

40 Mr Robert Player, *Committee Hansard*, 3 April 2006, p. 53.

41 *Committee Hansard*, 28 June 2006, p. 3.

42 Mr Kim Gillis, *Committee Hansard*, 18 August 2006, p. 49.

7.39 The Hon Andre Haermeyer, Victorian Minister for Manufacturing and Export, Minister for Financial Services and Minister for Small Business, commented on the costs of mobilising labour:

> Sometimes the workforce is extremely reluctant to move and sometimes they will not move, so there is a cost associated with building up the skills that are required. And there is a cost associated with the alternative of attracting the workforce to a different location.[43]

7.40 Major General Haddad, Strategic Adviser, Victorian Department of Industry and Regional Development, considered that workers will not necessarily move to work on naval shipbuilding projects, if their skills can be used locally in other sectors.

> …the workforce is very mobile here in Melbourne and Victoria because of the choices available to it. So my judgement would be that it is most unlikely that those workers would go to South Australia from Victoria to do work because they will find other opportunities here because of existing shortfalls.[44]

7.41 The AMWU noted that industry has never had trouble attracting people to shipbuilding because of the job security provided by the length of the projects. Mr Pat Johnston, National Organiser, considered that the majority of the workforce would move from the east coast to South Australia if offered good earnings and stable employment. However, industry should not rely on moving an established workforce:

> I think the attractiveness of these projects will be there for employees and skilled employees. But those people who are domiciled already in Williamstown I do not think would go to Western Australia for a shipbuilding project. Some would—maybe the younger and the more mobile—but certainly for people who are entrenched in their own area I believe it is just too big an ask.[45]

7.42 Overall, the Victorian Government considered that labour shortages for naval shipbuilding could be met with proper planning as to where the work occurs.[46] While a large core of skilled workers is inevitably required at prime shipbuilding sites, modern shipbuilding techniques such as modular construction (discussed in chapters 2 and 6) enable work to be geographically distributed and to some extent mitigate the need for mass labour mobility.

7.43 Defence cautioned against assuming that construction work can be distributed to a large number of regions. Mr Warren King, DMO's Air Warfare Destroyer Project

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43 *Committee Hansard*, 18 August 2006, p. 23.

44 *Committee Hansard*, 18 August 2006, p. 24.

45 Mr Pat Johnston, National Organiser, AMWU, *Committee Hansard*, 28 June 2006, p. 52.

46 The Hon Andre Haermeyer, Victorian Minister for Manufacturing and Export, Minister for Financial Services and Minister for Small Business, *Committee Hansard*, 18 August 2006, p. 16.

Manager, commented that while distributing module fabrication work has economic benefits and can help maintain the skill base across the nation, using too many sites can erode the economic gains because there is 'just too much management and too much distribution'. Research conducted in the UK indicated that economically, around three sites was the optimal number for module fabrication work.[47]

7.44 The South Australian government proposed that centralising naval shipbuilding around a hub in South Australia would enable the development and short-term expansion of the industry base, without the challenges of regional distribution:

> If there was felt to be a need to maintain two shipbuilders, this could be achieved at a single site where maximum use could be made of common infrastructure and skills base.[48]

7.45 Geography and labour mobility issues were also raised in relation to repair and maintenance work. Both Tenix and the Victorian government commented on Defence's policy of repairing and maintaining naval ships near the home port, at Fleet Base East in New South Wales or Fleet Base West in Western Australia. The Victorian government considered that this policy will effectively exclude Victorian based yards from repair and maintenance contracts.[49] Tenix stated:

> Our experience is that it is difficult to manage workforce issues in this very important part of our business [repair and maintenance] because of the geographic sequence in which Defence awards R&M [repair and maintenance] contracts. For most of the last year, our facility in Henderson operated at a high tempo of activity due to the large volume of R&M contracts awarded for ships home-ported at Fleet Base West. As a consequence, we were able to recruit and retain a highly skilled workforce in Henderson to perform naval repairs. However, for the next twelve months, nearly all R&M contracts planned by Defence will be for ships home-ported at Fleet Base East. This means we will have skilled R&M workers in Western Australia next year but little or no work for them; and concurrently we will have to scramble to assemble an R&M workforce for the Sydney region.[50]

7.46 Defence on the other hand commented on the geographic flexibility of the repair and maintenance sector, with some items of equipment being able to be removed for repair at various locations and in other cases the labour force being mobile. Defence acknowledged that continuity of work was a relevant factor:

> Items that are repaired in the ship are done at each of those east and west coast locations and the skill base either moves to those particular locations

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47 *Committee Hansard*, 18 August 2006, p. 49.

48 Government of South Australia, *Submission* 9, p. 36.

49 *Submission 31*, p. 25.

50 *Submission 26*, p. 6.

> because that is where the work is, or is able to be recruited from the local industry base. Because we have now built up a fair degree of continuity of work in our east and west coast repair and maintenance industries, they are able to cope with the workloads in those two geographic locations and are able to maintain our ships appropriately there.[51]

7.47 Even so, the comments of Tenix indicate that sensible planning can assist industry to better manage work plans.

Skill sets

7.48 As noted above, naval shipbuilding requires skills across a wide range of areas and the predicted demand for workers varies across different skill sets. The following sections review some of the workforce and skills issues raised in relation to particular skill sets.

Trade skills sets

7.49 According to Defence, the majority of the increased workforce that would be required to deliver its naval shipbuilding program within Australia is in hull and mechanical construction and module fabrication.[52] These fields are reliant on skilled tradespeople and, as noted previously, there are currently national skills shortages in a number of trade occupations.

7.50 Apprenticeships and traineeships are an important source of skilled trade labour and several witnesses expressed confidence in the ability of the training sector to provide sufficient skilled workers to meet the peak demands of the naval shipbuilding program.[53] Challenger TAFE representatives described recent growth in apprenticeships and traineeships in Western Australia. Significantly, a state government target of 30 000 apprentices and trainees in training by 2009 had been met four years ahead of schedule. Much of this growth had been in areas critical to the shipbuilding industry, including trades such as metal fabrication, fitting and turning and welding.[54]

7.51 The committee was advised that the overall drop out rate for trade apprentices is around 30 per cent.[55] Representatives of Challenger TAFE in Western Australia described some of the strategies they are employing to reduce attrition, including a support network of field officers to work with apprentices and employers. The committee heard that the highest apprenticeship drop out rates occur in the first few

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51 Rear Admiral Trevor Ruting, *Committee Hansard*, 28 March 2006, p. 12.

52 Department of Defence, *Submission 20*, p. 16.

53 See Challenger TAFE, Western Australia Department of Education and Training, *Committee Hansard*, 3 April 2006.

54 Mr Robert Player, Challenger TAFE, *Committee Hansard*, 3 April 2006, p. 51.

55 Mr Robert Player, Challenger TAFE, *Committee Hansard*, 3 April 2006, p. 51.

months of an apprenticeship.[56] Solutions therefore need to look at career information and decision making for those entering apprenticeships, not only supporting people once they are undertaking a trade qualification.

7.52 Other witnesses discussed the need for not only increased numbers of workers qualified in relevant trades, but also the need for specific skills relevant to the industry. Mr John Rothwell, Executive Chairman of Austal Ships, commented that 'people need the practical, hands-on experience within the industry in addition to what they learn at TAFE'.[57] Mr Rothwell also commented that there are limits to the number of apprentices a company can take on, given the need to have tradesmen to supervise apprentices.

7.53 The distinction between aggregate numbers of trade workers and the availability of specific skills was also canvassed under the government's National Skills Initiative by the Engineering Working Group. The group found that among engineering firms experiencing skills shortages, nearly two-thirds reported a general lack of people with the requisite trade qualifications. However, some 40 per cent reported that 'the shortage was more related to an inability to find people with specific skills required by the enterprise within the occupational area'.[58]

7.54 While much evidence to the inquiry focussed on potential labour shortages, naval shipbuilding can also provide a catalyst for skills development. The AMWU argued:

> A sustainable naval shipbuilding industry with regular contracts will be part of the solution to the skills shortages. If it is decided to purchase vessels offshore, not only will we lose the skills to provide through life support to the vessels, we will lose a valuable skills base for the wider economy.[59]

7.55 The AMWU was of the view that employers have been remiss in providing training and apprenticeships over the last 15 years, and that current demand is generating change.[60] Mr Pat Johnston, National Organiser, commented:

> In relation to the skills issue, I do not think anybody should get spooked about a shortage of skills. Skill shortages have always been cyclical. We are seeing a boom in the mining industry and a demand for a lot of skills. The skills needed previously—say, in the last five years—are now coming on stream and they are in high demand. All the manufacturing and heavy engineering companies are now starting to take on apprentices. They

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56 Mr Robert Player, Challenger TAFE, *Committee Hansard*, 3 April 2006, p. 51.

57 Mr John Rothwell, Executive Chairman, Austal Ships, *Committee Hansard*, 3 April 2006, p. 64.

58 National Industry Skills Initiative, Engineering Working Group, 2001, *Engineering Skills Shortages*, Appendix 1, p. iv.

59 *Submission 21*, p. 12.

60 Mr Pat Johnston, *Committee Hansard*, 28 June 2006, p. 48.

> recognise that in the future they are going to need higher skills, so there is a very distinct movement towards retraining.[61]

7.56 Evidence from ADI supported the assertion that apprenticeship training has gathered greater focus in recent years:

> At Garden Island we have apprenticeship programs, which we recommenced about four years ago. When ADI was a corporatised activity, it tended not to focus so much on those for a number of years. However, certainly now, as a privatised ADI, we see investment in our people as being fundamental to our success. We are attempting to grow our own, so to speak, and are investing a significant amount of our budget into doing that. We are not sitting back waiting to be spoon-fed qualified people; we are trying to grow our own, nurture our own and improve our own.[62]

7.57 Mr Martin Edwards, General Manager ASC Shipbuilding, described the training ASC is planning for the AWD project:

> There will certainly be a large focus on apprentices. The TAFE system will be used for the base training of apprentices. The maritime skills centre will be used for a lot of upskilling and very specialised ship training associated with the project.[63]

7.58 The committee welcomes initiatives from the private sector to recruit and train apprentices. Skills development should be one of the broader outcomes generated by the significant government investment made in naval acquisitions. Again, this is an area where public-private partnering would be beneficial.

High-end skill sets

7.59 The committee was informed that the complexity and sophistication of naval shipbuilding is predominantly related to design, installation and integration of ships' systems, rather than construction of the hull and structure.[64] In particular, the increasing use of modular technology requires high order integration engineering skills.[65] In Defence's view, these skills are the most critical to develop and retain in order to ensure ongoing support and self-sustainability of the fleet:

> The more important capabilities that are required to flow on from construction into support are associated with the ability to adapt the design and integrate new systems and the ability to support complex unique

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61 *Committee Hansard*, 28 June 2006, p. 43.

62 Mr Geoff Smith, ADI, *Committee Hansard*, 28 June 2006, p. 9.

63 *Committee Hansard*, 19 April 2006, p. 12.

64 See for example Austal, *Submission 7*, [pp] 5–6; Submarine Institute of Australia Inc, *Submission 3*, pp. 16–17; ASC Pty Ltd, *Submission 17*, p. 9; Department of Defence, *Submission 20*, p. 3. See also Chapter 2.

65 Mr David Kobelke, Director, Industry Capability Network, Chamber of Commerce and Industry, Western Australia, *Committee Hansard*, 3 April 2006, pp. 21 and 27.

> systems. The competencies of fabrication and fitout associated with shipbuilding are less critical.[66]

7.60 ASC Pty Ltd commented that high order engineering skills are particularly critical in the complex start-up design to production phase, which occurs only once per ship class program. This phase is significant to the overall cost effectiveness of the program, as it sets the foundations for later build, system integration, test and evaluation phases.[67] Without consistent demand, these skill sets can be lost:

> A key characteristic of cost-effective and successful shipbuilding programs is that there is ongoing scope to exercise and mature these critical high-end engineering skills so that they are available to be applied to the next shipbuilding program.[68]

7.61 The committee heard that retention of workers with these high-end technical skills is as much about the nature of the work, as remuneration and other benefits. Representatives of Nautronix Ltd, an SME involved in the defence and offshore oil and gas industries, commented that having a strong research and development component and plenty of stimulating work was essential for attracting and retaining skilled staff.[69] Mr Michael Gallagher, Nautronix CEO, cautioned 'Be in no doubt: engineers love interesting work and they are going to go where that interesting work is'.[70] ASC commented that even within a relatively large shipbuilding program, 'these skills can atrophy if not further exercised'.[71]

7.62 As such, development work and not only maintenance and support work may be required to retain these skill sets in Australia. The South Australian government commented:

> …there is no doubt that challenging technical work, well beyond just routine maintenance, is required to retain a technically competent, motivated and productive workforce.[72]

7.63 This view was also evident during committee members' visit to the U.S. Mr Mark Russell, head of Engineering at Raytheon Integrated Defence Systems, commented that challenging, interesting work is the key to retention. He noted that for engineers, enjoying the work that they do and working in a good team was often more of an incentive than monetary considerations. Mr Russell commented that a culture of

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66 Department of Defence, *Submission 20*, p. 25.

67 ASC Pty Ltd, *Submission 17*, p. 6.

68 ASC Pty Ltd, *Submission 17*, p. 6.

69 Mr Michael Gallagher, CEO, Nautronix Ltd, *Committee Hansard*, 3 April 2006, pp. 34 and 37.

70 Mr Michael Gallagher, CEO, Nautronix Ltd, *Committee Hansard*, 3 April 2006, p. 35.

71 ASC Pty Ltd, *Submission 17*, p. 6.

72 South Australian Government, *Submission 9*, p. 15.

interesting, challenging work in a stimulating team environment would need to be cultivated for Australia's AWD project in order to retain skilled staff.

7.64 Defence acknowledged that existing labour capacity was a result of skills developed through past build projects. Mr Warren King notably remarked:

> …we would not embark on the AWD program as a nation today if it had not been for all the skill sets that have been built up and which are broadly retained in the industry base as a result of Collins, Anzacs and minehunters.[73]

7.65 The committee emphasises that today's naval shipbuilding workforce capacity in Australia reflects the significant government investment made in past build programs. In turn, local construction of currently planned projects is an investment in the skills resources needed for the future.

Design skills

7.66 While Australia largely sources its ship designs from overseas,[74] there was general agreement that it is important for Australia to retain an element of design capability. These skills enable designs to be tailored to Defence specific requirements, facilitate modifications during the building of the ship and are integral to ongoing support, maintenance and upgrade work.[75] Design skills are also critical for economic productivity:

> …strong design engineering capabilities permit the shipbuilder to plan with far greater efficiency and production/construction arrangements, materials selection, workforce skills requirements and matters that bear on the through-life support of the vessels. Possessing these high-end design engineering skills is essential for a shipbuilder to optimise production efficiencies.[76]

7.67 The Submarine Institute of Australia commented on the importance of nurturing design skills for ongoing maintenance and repair:

> A design and construction capability is a huge benefit when modifying ships and submarines and in carrying out unusual repairs, such as hull cracks…and repairs to power generation equipment.

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73 *Committee Hansard*, 18 August 2006, p. 34.

74 For example: the intellectual property rights for the Collins class submarines rest with the Swedish firm Kockums, which was acquired by Howaldtswerke–Deutche Werft in 2002; the ANZAC frigates were designed by the German firm Blohm+Voss GmbH, a division of ThyssenKrupp Marine Systems; the contract for the AWD design will be contested between Spanish firm Navantia and the American firm Gibbs & Cox; and the contract for the LHD design will be contested between Navantia and the French firms Armaris and DCN.

75 ASC Pty Ltd, *Submission 17*, p. 6.

76 ASC Pty Ltd, *Submission 17*, p. 6.

> Even more important is to have the industry continually engaged so that in the unfortunate but potential event of battle damage or accidental damage, major repairs can be conducted expeditiously within country; design experience is especially important in this case.[77]

7.68 Recognising the challenges associated with sustaining an indigenous design capacity in Australia, ThyssenKrupp Marine Systems Australia advocated a single Naval Design Bureau for all aspects of naval design work in Australia. ThyssenKrupp emphasised the importance of planning, consistent workload and nurturing the capabilities developed through previous ship builds.[78] Mr Peter Hatcher, CEO, commented that a competitive approach was not appropriate for design work:

> Design is all about knowledge. It relies entirely on putting together a significant team of very experienced or experienced design engineers working within an organisation, with a disciplined process and with access to the right sort of information on standards and materials. Such systems are very difficult to build and maintain and they are very susceptible to eroding their capability very quickly. As I said before, without a guaranteed workload or an assured workload, the capability rapidly disappears. In principle, I suppose there is no difference between design and production, because we could say the same things about production, but in my experience it is easier to put together a production capability. It is easier to move individual people from one production facility to another, to establish, if you like, greenfield sites for production. It is very hard, I believe, to do that for design.[79]

7.69 Engineers Australia commented that, while cost effective, buying overseas designs reduces the learning opportunities for Australian engineers, technicians and research staff:

> … the more the Australian Department of Defence buys ship designs and weapon systems from overseas, the less self-reliant we become as a nation in terms of technical capability.[80]

7.70 Australia needs high-end design capacity not only for self reliance, but to be able to interact effectively and knowledgably in the global market. The Royal Institute of Naval Architects noted that, given the highly specialised nature of naval ship design, many projects around the world are internationally collaborative. Australian shipbuilding projects enable Australian designers to both contribute to, and learn from, such collaboration:

> Australia has considerable opportunity to make a contribution to that process by bringing what are considerable talents in this country to that process. By being involved in a project like the air warfare destroyer—and

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77 The Submarine Institute of Australia, *Submission 3*, p. 9.

78 *Committee Hansard*, 18 August 2006, p. 5 and *Submission 34*, pp. 2–5.

79 *Committee Hansard*, 18 August 2006, p. 6.

80 Engineers Australia, *Submission 24*, p. 12.

> indeed the Collins class submarine—we develop our own skills in specialised areas which we can then contribute to others and, by the same token, sustain the skills that we need in-country.[81]

7.71 Gibbs & Cox Australia explained that it was able to take advantage of design skills in both Australia and the U.S.:

> We are currently employing Australians who have specialist skills and who are riding off those skills of previous programs. Many of our new employees coming from Australia have a long heritage of involvement in Anzac programs, minehunter programs and even US programs…So there is talent here in Australia that should be corralled and used to the benefit of Australia, the government and then possibly export ability. In addition, we are supplementing those staff with US citizens who are then transferring to Gibbs and Cox Australia, and they will act as mentors, teaching the new employees the design techniques that we employ within the US company to meet the US Navy's need. That means we are growing a capability not in isolation from but in parallel with the growth of capability in the USN.[82]

7.72 The committee heard from the Australian Maritime College that Australia's capacity for innovation in the high-end skills areas such as design is dependent on research and development. Developing these skills is important not only for project delivery, but for initial planning. Dr Brandner, a Research Leader at the College said:

> …research needs to be done well ahead of the development of the platform; it should not be after a contract has been left, it should be much earlier. They are strategic studies, concept studies, where decisions should be made well ahead of the final bid. Then we are more informed as a buyer, because there is more debate and more discussion before the design is approaching the tender stage, and we are better able to deal with overseas allies, if you like, or collaborators such as the US if we have more of a knowledge base. So it is about investment in the future, I would argue. If the platform is being built, it is too late.[83]

7.73 Defence concurred that there can be a stronger tie between design and system knowledge when a ship is built in Australia. However, Defence did not see Australian builds as essential for ensuring ongoing vessel support.[84] Defence considered that the necessary design skills could be developed and retained in Australia as part of the acquisition process, without original ship design occurring here:

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81 Mr John Jeremy, Member of Council, Australian Division, Royal Institute of Naval Architects, *Committee Hansard*, 28 June 2006, p. 55.

82 Mr Peter Croser, Managing Director, Gibbs & Cox Australia Pty Ltd, *Committee Hansard*, 19 April 2006, p. 40.

83 *Committee Hansard*, 28 April 2006, p. 36.

84 Department of Defence, answer to question on notice, 28 March 2006 (received 29 May 2006), pp. 3 and 10.

> Approximately 2% of the acquisition cost relates to Australian industry engagement in design activities. This percentage allows for sufficient transfer of design skills to ensure that Australia retains the skills to meet follow-on through life support requirements provided that such access and involvement in the detailed or production design is provided to Australians.[85]

7.74 Even with sufficient design skills transfer, an important criterion for efficient through-life support when vessels and systems are not designed in Australia is that adequate access is obtained to relevant intellectual property and design rights. This issue is discussed in the next chapter of the report.

Systems integration

7.75 As discussed in chapter 2, the quest for naval capability advancement means that naval vessels have increasingly sophisticated weapons, sensor and communication systems. Systems integration skills, which ensure that all components of the systems work together and work with the ship platform, are therefore essential to a modern naval shipbuilding capacity.

7.76 Raytheon Australia commented on the difficulty of generating such systems integration capacity, emphasising the importance of knowledge transfer:

> Systems integration is complex, there are not books on the subject and the capability is acquired through experience and working with those who have acquired the capability through experience.[86]

7.77 In Raytheon Australia's view, systems integration is an area where local subsidiaries of international companies can make a substantial knowledge and skills contribution:

> We are proud of the fact that the company is staffed entirely by Australians, over three quarters of whom are engineers and technicians. However, a key to Raytheon's success and growth in Australia has been the ability and willingness of our parent company to strengthen the capability of its local subsidiary by transferring technology, knowledge, skills and processes.[87]

7.78 A review of the defence industry by ACIL Tasman in 2004 also concluded that systems integration capacity should be viewed in an international context:

> ….innovation in military systems integration depends much more on how effectively specific institutions—be they government laboratories,

85 Department of Defence, answer to question on notice, 28 March 2006 (received 29 May 2006), p. 6.

86 Raytheon Australia, *Submission 35*, p. 3.

87 Raytheon Australia, *Submission 35*, pp. 2–3.

> companies or universities—interact in a collective system of knowledge creation and use that has both domestic and overseas dimensions.[88]

7.79 The review pointed to the need to balance both international input and local capacity:

> For the foreseeable future, Australian-based subsidiaries of US firms will remain key means by which Australia obtains US technology of critical strategic and commercial importance. Australian access to this technology is highly conditional, however…Hence such access as we have does not obviate the need to maintain a local capacity to integrate systems—both locally developed and imported—in configurations suited to Australian requirements.[89]

7.80 The importance and scarcity of high quality systems integration skills highlights that Australia's skills capacity cannot be assessed in isolation. Networks and business relationships which facilitate knowledge and skills transfer from international leaders are also important. The committee considers it important that such networks are used effectively, not only as a source of services and information, but to contribute to Australia's knowledge and skills base.

Project management skills

7.81 As discussed in chapters 3 and 4, Australia's naval shipbuilding history has seen the delivery of large, complex and technically difficult projects to varying degrees of success. Project management has always been key to successful and efficient naval shipbuilding and with the advent of modular build processes, evolving advanced open architecture systems and increased reliance on global alliances, project management skills have become only more critical.

7.82 ThyssenKrupp Marine Systems Australia considered that the 'greatest risk to complex warship construction lies in inadequate management systems and inexperienced engineering management'.[90] ADI commented that to deliver a 'fully integrated package of capabilities, the core competencies of a successful prime tenderer must now be prime contracting, project leadership and project management'.[91] Mr Smith, Director, Naval Sales and Marketing, explained:

> Project management delivers the ability to ensure that schedules are developed and managed, costs are controlled, risks are identified and mitigated, resources are available when and as required, subcontractors are

88 ACIL Tasman, November 2004, *A Profile of the Australian Defence Industry*, p. 97.

89 ACIL Tasman, November 2004, *A Profile of the Australian Defence Industry*, p. 98.

90 *Submission 34*, p. 2.

91 *Committee Hansard*, 28 June 2006, p. 3.

> managed, overseas technologies are introduced and management tools are current and are applied.[92]

7.83 In Defence's view, the availability of high-end management skills is currently a 'major weakness' in the shipbuilding industry, with management teams 'relatively thinly resourced to take on the major projects foreshadowed by Government'.[93] Defence observed that in the past there has been a high level of transition of management teams between construction projects that would not be possible in future years given the schedule of parallel and overlapping projects.[94]

7.84 The committee notes this concern and accepts that high-level, experienced project management is critical for the successful delivery of complex naval ship projects.

The AWD and LHD builds

7.85 Issues relating to the Australian workforce's capacity for naval shipbuilding coalesced in debates about the industry's capacity to deliver both the AWD and LHD projects. Defence questioned, from a workforce perspective, whether it was feasible or necessary to construct both the AWDs and the Amphibious ships in Australia. Others were confident that the industry could meet the skills challenges associated with both builds.[95]

7.86 In a *Profile of the Australian Defence Industry* produced in 2004, ACIL Tasman commented on the possible implications of the dual build program. Noting the skills shortages already experienced by Defence industry businesses, ACIL Tasman reported:

> Continuation of this shortage during concurrent construction of the AWD and amphibious support ships and on-going support of the fleet could entail significant cost and schedule risks for the above construction program.[96]

7.87 According to Defence, the peak demand period resulting from these projects (2008 to 2012) would require a doubling of the construction workforce. Defence emphasised that such expansion should not reduce the labour resources available to provide ongoing in-service support to the existing fleet. That is, new workers would need to be brought into the sector. Defence questioned whether there are sufficient sources of new skilled labour to meet the construction peak generated by the AWDs

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92 *Committee Hansard*, 28 June 2006, p. 3.

93 Department of Defence, *Submission 20*, p. 25.

94 Department of Defence, *Submission 20*, p. 25.

95 See for example Australian Industry Group, *Submission 8*, [p.] 4; Mr Jamie Mackaway, Director, Industry and Community Planning, Department of Education and Training Western Australia, *Committee Hansard*, 3 April 2006, p. 58.

96 ACIL Tasman, November 2004, *A Profile of the Australian Defence Industry*, p. 35.

and LHDs, commenting that 'This is a significant workforce 'peak' that will be hard to meet'.[97]

7.88 While Defence considered that the workforce peak would be hard to meet, it also acknowledged that it did not yet have industry data to support this assumption:

> Industry companies will submit their proposals for how they will grow their staff to build up to the required numbers. Until we have those submissions from industry we cannot predict whether they actually have all of the staff required and whether they will be able to obtain them in a time frame that is commensurate with the schedules for build.[98]

7.89 Defence also indicated that an expanded workforce would be hard to sustain, as the ongoing workforce needed for repair, maintenance and upgrade of the fleet would be substantially smaller.[99] Defence was of the view that Australian construction of the AWDs alone would expand the workforce sufficiently to meet the ongoing service needs of its fleet:

> With the onshore build of AWDs and the long-term maintenance programs for Collins and Anzac, there will be sufficient skills—notably, design, platform and system engineers—to meet that requirement and to act as a base for any future development programs. An LHD onshore build would only add large modules of construction skills to the skill base developed by the AWD program and the long-term maintenance contracts.[100]

7.90 Defence emphasised that the case for a domestic build was not as strong for the LHDs as for the AWDs, commenting that a local build was likely to produce relatively few savings for through-life support.[101] In particular, Defence argued that the LHD platform would not require the highend skills that are critical for the industry to retain:

> For a low to moderate technology basic platform like the Amphibious-LHD (as differentiated from a high technology AWD/Aegis or a Collins submarine) there is only a low correlation between Build capability and Sustain/Upgrade capability…The key skills to nurture for the long-term in this technology area are in systems integration and upgrade. In this sense, the skills used during platform construction are…less important in the through life support phase of ships.[102]

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97 Department of Defence, *Submission 20A*, p. 12.

98 Rear Admiral Ruting, *Committee Hansard*, 28 March 2006, p. 6.

99 Department of Defence, *Submission 20A*, p. 13.

100 Lt Gen. Hurley, *Committee Hansard*, 18 August 2006, p. 29.

101 Department of Defence, answer to question on notice, 28 March 2006 (received 29 May 2006), p. 2.

102 Department of Defence, answer to question on notice, 28 March 2006 (received 29 May 2006), p. 1.

7.91 A report by ACIL Tasman also commented on the different skill sets needed for the two projects. While the Air Warfare Destroyers would require more specialised fabrication skills, ACIL Tasman considered that construction of the Amphibious Ships could 'draw more readily on the skills available in the general engineering base'.[103]

7.92 Engineers Australia noted that the workforce requirements for the AWDs and remaining capacity, or lack of, to deliver the Amphibious Ships has not yet been quantified.[104] However Engineers Australia considered that much of the nation's engineering capacity would be taken up with the AWD project.[105]

7.93 While Engineers Australia would welcome an expansion of the engineering workforce to meet the demand of the Amphibious Ships build, there would need to be commitment to ongoing work to sustain the workforce.[106] Engineers Australia observed:

> Whilst Engineers Australia supports the Government's strong preference for future naval ships to be built in Australia, the argument to build the Amphibious Ships in Australia, is not as clear cut as it is for the Air Warfare Destroyers. With little future demand currently programmed by Defence for large steel ships to be built in Australia, the establishment costs for new infrastructure and training must be amortised over the two ship LHD program.[107]

7.94 Numerous submitters referred to a study by ACIL Tasman which suggested that the skills pressures generated by both the LHD and AWD programs would not be significant given the size of the relevant labour pools.[108] However, other submitters noted that regional effects were important. For example, DITR commented:

> At the aggregate level it will be marginal in terms of the national economy. The shipbuilders group had a large study done…and at an aggregate level it is certainly marginal. The question will be whether there are specific effects in specific locations. You have had advice from a couple of the aluminium shipbuilders anxious about the supply of labour. If these things are managed with appropriate resources being put into training then that will reduce the extent of those problems.[109]

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103 ACIL Tasman, November 2004, *A Profile of the Australian Defence Industry*, p. 34.

104 Engineers Australia, *Submission 24*, pp. 1 and 26.

105 Engineers Australia, *Submission 24*, p. 1.

106 Engineers Australia, *Submission 24*, p. 1.

107 Engineers Australia, *Submission 24*, p. 26.

108 See for example, Government of Western Australia, *Submission 23*, p. 21.

109 Mr Mike Lawson, General Manager, Aerospace Defence and Australian Industry Participation Branch, DITR, *Committee Hansard*, 3 July 2006, p. 80.

7.95 ThyssenKrupp Marine considered that expanding the skilled workforce base to undertake construction of the AWDs and LHDs was possible and appropriate, but that other projects may need to go offshore:

> …construction of the AWDs and LHDs in Australia will impact on the other major acquisitions: the AOR [Auxiliary Oiler Replenishment ship] and strategic lift ship. The AWDs and LHDs will be the largest and most complex warships ever built in Australia. Problems, whose resolution will require experienced, skilled engineering management, will inevitably occur. Stretching the capacity of Australian industry to also build the AOR and strategic lift ships in Australia would introduce a very significant risk that the AWD and LHD projects would be left without sufficient resources to overcome these problems. The end result would be a significant increase in the risk of failure of the AWD and LHD projects.[110]

7.96 The Government of Western Australia reported the findings of a study into the employment demand and predicted skill requirements of major projects in WA over the period 2005 to 2010. The study found that while Western Australia could not afford to reduce its efforts to ensure the availability of skilled workers, generally major projects were not being significantly delayed or failing to go ahead as a result of an inability to source skilled labour. The Western Australian government considered that while 'the State would be ill-advised to leave the market entirely to its own devices', government and industry skills initiatives combined with the timing of the amphibious ships build should be 'sufficient to obviate the need for adjusting the demand side of the labour market by, for example, building the amphibious support ships offshore'.[111]

7.97 The Queensland government indicated that the AWD and LHD build programs should provide a catalyst for industry investment in workforce training:

> It is estimated that around 3,000 to 5,000 additional engineers, specialist technicians, key trades people and project managers will be required by defence industry over the next decade to provide the skills necessary to build and maintain Australia's major defence platforms. Defence and defence industry alike have an interest in, and responsibility for, developing these skills. The funding available for the program will not meet the full requirement for growth and industry will need to make an additional investment to grow the industry skill base to the required level.[112]

7.98 Submitters to the inquiry drew different conclusions about the implications of workforce availability for the AWD and LHD builds. Defence considered that

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110 ThyssenKrupp Marine Systems Australia Pty Ltd, *Submission 34*, p. 2. The Strategic Lift Ship Capability is currently planned for delivery in 2016–2018 and the Auxiliary Oiler Replenishment ship (HMAS *Success* replacement) is planned for delivery in 2015–2017. See *Defence Capability Plan 2006–2016*, pp. 67–69 and p. 134.

111 Government of Western Australia, *Submission 23*, pp. 21–22.

112 Queensland Government, *Submission 29*, p. 12.

building only the AWDs or Amphibious Ships in country would have a positive impact on program costs. Specifically:

> Defence would not be required to bear the significant Non-Recurring Expenditure (NRE) costs associated with the ramping up and ramping down of workforce requirements. The steeper the ramp-up /ramp-down the higher the NRE costs borne by Defence.[113]

7.99 Other witnesses considered that workforce and skill supply issues made a strong case for longer-term, more even defence demand. For example, the RSL considered that long-term employment benefits could be assured through a policy of Australian construction of all Australian warships and an ongoing ship replacement program as vessels reach the end of their service life.[114] Future Directions International Pty Ltd commented that 'Consistency of order books is the essential means of maintaining a skills set'.[115] The Government of South Australia commented that, from a workforce perspective, simultaneous construction programs are not ideal and that demand needs to be smoothed over the longer term.[116] South Australia called for a national skilling and shipbuilding infrastructure plan in the context of a rationalisation of the industry.[117] The issue of demand planning is covered further in chapter 15.

Workforce and skills initiatives

7.100 Numerous submitters expressed confidence in the ability of the industry to meet future naval construction demand. The committee heard about a number of initiatives being implemented by governments and industry to increase the supply of skilled labour to the naval shipbuilding industry. Several of these initiatives are canvassed below.

Federal government—skilling Australia's defence industry

7.101 The Skilling Australia's Defence Industry (SADI) Program is a federal government policy initiative aimed at addressing the shortfall in the quantity and quality of skills available to defence industry. In 2004 the federal government committed up to 0.5 per cent of the money spent on major defence capital equipment projects and maintenance to SADI, equating to around $215 million over ten years.[118]

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113 Department of Defence, *Submission 20A*, p. 13.

114 Returned and Services League of Australia Ltd (RSL), *Submission 6*, p. 3 and p. 5.

115 Mr Gregory Copley, Director and Acting Chief Executive, Future Directions International Pty Ltd, *Committee Hansard*, 3 April 2006, p. 16.

116 Government of South Australia, *Submission 9*, p. 26.

117 Government of South Australia, *Submission 9*, pp. 5, 26.

118 Department of Defence, answer to question on notice, 28 March 2006 (received 29 May 2006), p. 42.

7.102 Defence has entered into SADI agreements with five companies, with two more imminent. A further two proposals are under review and Defence anticipates proposals from a further 15 companies in coming months.[119] The initial focus of SADI is on entering into agreements with larger companies who hold major contracts with Defence. Agreements are not generally established directly with SMEs. Rather, larger companies are encouraged to provide places for their subcontractors in the programs for which they receive SADI funds.[120] The South Australian government commented on the need to make SADI more appealing to small to medium enterprises.[121]

7.103 Proposals for SADI funding must meet a range of criteria, including addressing short, medium and long term growth requirements, attracting experienced and entry level employees and retaining skilled employees in the industry for longer. SADI proposals must target professional and technical trades where current and future shortages are identified.[122]

7.104 SADI funding is specifically aimed at expanding, not maintaining, the skilled workforce:

> Consideration will be given only to those proposals that demonstrably increase the numbers of skilled employees over and above the projected growth that could be reasonably expected within the constraints of a company's normal commercial considerations or any mandatory contractual conditions within an extant contract between Defence and the company. Funding will not be made available to proposals that maintain the status quo.[123]

7.105 Given that SADI is a relatively new program, as yet there is little evidence to assess its effectiveness. Defence explained that companies receiving SADI funds are required to report progress against agreed targets twice a year. The one company that has so far been required to report has achieved all its targets.[124]

State government initiatives

7.106 State governments, in conjunction with industry, have implemented a range of training and skilling initiatives to improve labour supply. The South Australian,

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119 Department of Defence, answer to question on notice, 28 March 2006 (received 29 May 2006), p. 42.

120 *Skilling Australia's Defence Industry*, www.defence.gov.au/dmo/id/sadi/index.cfm, (accessed 8 May 2006).

121 South Australian Government, *Submission 9*, p. 16.

122 *Skilling Australia's Defence Industry*, www.defence.gov.au/dmo/id/sadi/SOR.cfm, (accessed 8 May 2006).

123 *Skilling Australia's Defence Industry*, www.defence.gov.au/dmo/id/sadi/SOR.cfm, (accessed 8 May 2006).

124 Department of Defence, answer to question on notice, 28 March 2006 (received 29 May 2006), pp. 42–43.

Western Australian and Queensland governments provided particular detail of initiatives undertaken and these are outlined below.

South Australia

7.107 The South Australian government described the investments it is making to meet the trade and high technology skills needs of its naval shipbuilding industry. These investments included:

- $20 million for a Maritime Skills Centre at Port Adelaide to deliver trade and technical training to ASC and other users. The committee heard that the welding classes delivered at Port Adelaide are world's best practice, due to the exceptionally high standard of welding required for submarine production and maintenance.[125]
- $8 million with DSTO and the University of South Australia for the Centre of Excellence in Defence Industry Systems Capability, to enhance Australian industry capability in software engineering, systems engineering, systems integration and systems maturity.[126]

Western Australia

7.108 The committee received evidence about a number of initiatives in Western Australia relevant to naval shipbuilding workforce supply. These included:

- the Skills Formation Taskforce—led by industry, the taskforce has a major role in reforming the apprenticeship and traineeship systems in WA. Outcomes have included reducing the duration of building and construction industry apprenticeships to two and three years, with similar reductions planned for the metals and automotive industries;[127]
- the fast track apprentice program—which gives mature age and semi-skilled workers an 'express route' through the traineeship and apprenticeship system;[128]
- a school apprenticeship link program—which targets the transition from school to apprenticeships;[129]
- Challenger TAFE—which provides training to the RAN and other regional maritime forces and has developed relationships with key naval shipbuilding enterprises;[130]

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125 See for example Mr John O'Callaghan, Australian Industry Group Defence Council, *Committee Hansard,* 28 June 2006, p. 21.

126 South Australian Government, *Submission 9*, pp. 32–33.

127 Mr Robert Player, Challenger TAFE, *Committee Hansard*, 3 April 2006, p. 46.

128 Mr Robert Player, Challenger TAFE, *Committee Hansard*, 3 April 2006, p. 46.

129 Mr Robert Player, Challenger TAFE, *Committee Hansard*, 3 April 2006, p. 46.

- the Western Australian Applied Engineering and Shipbuilding Training Centre, run by Challenger TAFE—which is the main shipbuilding vocational training provider in WA, located within the Australian Maritime Complex;[131] and
- the Western Australian Skills Advisory Board—which is working to encourage permanent skilled migration to Western Australia.[132]

7.109 A joint ministerial taskforce 'Skilling WA's Defence Industry Task Force' has been established to look closely at Western Australia's defence industry needs and inform, among other things, the establishment of a defence industry training centre and the courses that the centre will provide. The taskforce follows a state commissioned consultancy that investigated the training strategies Western Australia should adopt to meet defence industry workforce requirements. Recommendations of that consultancy included:

- establishing a defence industry centre of specialisation in Western Australia to act as a training provider, developer and broker;
- conducting a comprehensive audit of skill requirements;
- customising and badging education and training programs to meet industry needs and provide definite pathways into the industry;
- promoting defence industry careers to senior secondary school students;
- exploring a 'defence industry group training scheme' to assist smaller employers to take on apprentices and trainees; and
- evaluating strategies to increase uptake of engineering courses.[133]

Queensland

7.110 The Queensland government outlined a number of initiatives which, although not targeted specifically at the naval shipbuilding industry, address the trade workforce base relevant to the industry. Some of these initiatives included:

- the Queensland Skills Plan—aimed at modernising the vocational and education training systems, including improving delivery of TAFE training and fostering partnerships with training providers, industry, communities and unions;
- development of a Trade and Technician Skills Institute and expansion of the number of trade and training places;

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130 Mr Robert Player, Challenger TAFE, *Committee Hansard*, 3 April 2006, p. 46.

131 Mr Robert Player, Challenger TAFE, *Committee Hansard*, 3 April 2006, p. 46.

132 Mr Gary Collins, Executive Director, Client Services, Chamber of Commerce and Industry Western Australia, *Committee Hansard*, 3 April 2006, p. 23.

133 Mr Robert Player, Challenger TAFE, *Committee Hansard*, 3 April 2006, p. 47.

- the SmartVET strategy—encouraging accelerated skill development and supporting workers to upgrade their skills. Some of the initiatives involved include developing skills formation strategies, recognition of prior learning, industry training partnerships and accelerated apprenticeships; and
- an integrated Manufacturing Careers Initiative—to promote manufacturing careers and pathways and address negative perception about working in the manufacturing industry.[134]

Overseas migration

7.111 Mr Gary Collins, of the Western Australian Chamber of Commerce and Industry, commented that training local people is an inadequate solution to Western Australia's shortage of skilled tradespeople. Skilled migration is also required to provide an adequate labour pool for the naval shipbuilding sector.[135] Tenix presented a similar view:

> Existing Government policy provides for skilled immigration in certain circumstances. It is worthwhile considering the need for higher priority to candidates with proven skills applicable to industries such as oil drilling, mining, shipbuilding and steel fabrication. In most cases, the basic skills are similar and transferable between these adjacent industries. The potential immigrants are available now; and if allowed to immigrate under controlled conditions they could easily offset the shortage needed for the AWD and LHD programs.[136]

7.112 The AMWU agreed that migrant labour may be required as an interim measure to enhance Australia's naval shipbuilding capacity:

> We are satisfied that, with the retraining programs that are in place and the supply of supplementary labour when required as an interim measure—migrant labour sourced by reputable companies that are not ripping off these migrant workers—we can deliver all the skills required for these major projects either now or in the future. If there is a short-term skill shortage, that can be filled with supplementary labour through reputable companies. So we do not think the skill shortage is a real factor that should be considered when we are talking about whether or not we build these vessels overseas.[137]

7.113 The potential for skilled migration programs to meet specialist labour shortages in Australia depends in part on the availability of skilled labour overseas. Other countries, for example in Southern Europe, are also experiencing skills

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134 *Submission 29*, pp 13–19.

135 Mr Gary Collins, Executive Director Client Services, Chamber of Commerce and Industry, Western Australia, *Committee Hansard*, 3 April 2006, p. 23.

136 *Submission 26*, p. 7.

137 Mr Pat Johnston, National Organiser, AMWU, *Committee Hansard*, 28 June 2006, p. 43.

shortages.[138] Mr Pat Johnston of the AMWU emphasised the importance of appropriately managed migration programs in this context:

> Australia is not the only country with a shortage of skills. There is a skills shortage all around the world. That is why it is important when people are sourcing labour from overseas to make sure that they have the right providers—those who have the expertise to supply the labour.[139]

7.114 Skilled migration has had an increased focus in Australia's overall migration program in recent decades. A record 97 500 places were allocated for skilled migrants in 2005–06.[140] As explained below, the skilled migration program targets particular areas of skills shortage.

Permanent migration—Migration Occupations in Demand List

7.115 In addition to age, English language and other generic requirements, migrants under the General Skilled Migration program are generally required to be qualified in an occupation listed on Australia's Skilled Occupation List.[141] This list includes a wide range of occupations in the categories of managers and administrators, professionals, associate professionals and tradespeople and related workers. In addition, the Migration Occupations in Demand List (MODL) lists occupations and specialisations which have an identified and ongoing national labour shortage. Migration applicants are awarded additional points if their nominated occupation is on the MODL and further points if they have a job offer from a suitable Australian employer. Migration applications from people whose nominated occupation is on the MODL are also given priority processing.[142]

7.116 As at March 2006 several occupations relevant to naval shipbuilding were listed on the MODL, including metal trades such as metal fabricators, machinists, sheetmetal workers and welders. Electrical trades listed included general and specialist electricians and electronic instrument tradespersons. The MODL is reviewed twice a year to take into consideration any existing and emerging skills shortages.[143] Therefore, there is some scope for the existing permanent skilled migration program to respond to labour shortages related to naval shipbuilding.

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138 Mr David Kobelke, Director, Industry Capability Network, Chamber of Commerce and Industry Western Australia, *Committee Hansard*, 3 April 2006, p. 29.

139 *Committee Hansard*, 28 June 2006, p. 48.

140 Parliamentary Library, 2006, *Skilled migration to Australia*, http://www.aph.gov.au/Library/intguide/SP/Skilled_migration.htm, (accessed 15 June 2006).

141 Department of Immigration and Multicultural Affairs, *General Skilled Migration*, http://www.immi.gov.au/migration/skilled/index.htm, (accessed 15 June 2006).

142 Department of Immigration and Multicultural Affairs, *Do you have an occupation in demand?* www.immi.gov.au/migration/skilled/advice_doc/gn_modl.htm, (accessed 19 May 2006).

143 Department of Immigration and Multicultural Affairs, *Do you have an occupation in demand?* www.immi.gov.au/migration/skilled/advice_doc/gn_modl.htm, (accessed 19 May 2006).

Temporary migration—457 visas

7.117 In addition to increases in permanent skilled migration, there has been an increased focus on temporary migration in recent years. The Temporary Business (Subclass 457) visa, introduced in 1996 and expanded in 2002, allows skilled personnel to come to Australia to work for an approved employer for up to four years. Minimum skill and salary levels apply to positions filled through the 457 visa program, although certified regional employers have been able to seek exemptions from these requirements.[144] In 2004–05, some 26 280 class 457 visas were granted.[145]

Conclusion

7.118 Availability of skilled labour is a critical determinant of the Australian industry's capacity for naval shipbuilding. It is clear that Australia has a quality skilled labour base, with skills relevant to naval shipbuilding distributed across different sectors of the economy. Defence, however, is correct to draw a distinction between a capable workforce and one that has the capacity to meet an increase in demand.

7.119 It is clear that there are skilled labour shortages in a number of occupations required for naval shipbuilding. The committee received different views as to whether labour shortages are so significant as to affect adversely the successful delivery of upcoming build programs. Many witnesses were confident that the workforce could be expanded, through training, movement between sectors and immigration, to meet the challenges associated with both the AWD and LHD builds. Other submitters, including Defence, were more circumspect. The committee is cognisant that in a competitive tender environment, such as the current naval shipbuilding environment, companies would tend to be publicly optimistic about their ability to attract and retain labour.

7.120 The committee recognises the cautious approach by some submitters towards meeting the increased labour demands. For example, they are concerned that mobilising labour for naval shipbuilding could sacrifice the capacity for repair, maintenance and upgrade of the current fleet, or adversely impact on other profitable industry sectors.

7.121 However, the committee also recognises the opportunities a naval shipbuilding industry provides as a catalyst for skills development and workforce growth. Forecast labour shortages are an incentive for innovation and industry investment in training and skills development. Government investment in naval shipbuilding programs in the past has strongly contributed to the workforce capacity

144 Department of Immigration and Multicultural Affairs, *Sponsoring a temporary overseas employee to Australia*, http://www.immi.gov.au/allforms/booklets/1154.pdf (accessed 15 June 2006).

145 Senator Vanstone, Answer to Question No 1669, *Senate Hansard*, 14 June 2006, p. 102. Data refer to primary onshore visa grants.

that exists today. This resource, particularly highly specialised skill sets, will atrophy without further on-shore construction projects.

7.122 The committee considers that current skills shortages provide a significant but not insurmountable challenge for local construction of both the AWD and LHD platforms. The committee sees critical roles for industry, Defence and government in addressing the challenge. If Australian industry is to benefit from substantial federal funding, in the form of local construction of naval acquisitions, industry must show that is has innovative responses and solutions to skills challenges. The committee is encouraged by Australian and state government and industry investment in relevant training and skilling initiatives. The committee also notes that appropriate enterprise bargaining arrangements, which foster innovation and encourage workforce productivity, are important to address labour and skills issues and increase industry efficiency.