



MINISTER FOR DEFENCE  
THE HON DR BRENDAN NELSON MP



05 SEP 2006

Senator Steve Hutchins  
Senator for New South Wales  
Parliament House  
CANBERRA ACT 2600

Dear Senator

I refer to my letter of 24 March 2006 concerning the original Defence submission to the Inquiry into naval shipbuilding.

This submission contained a significant number of figures and financial or workforce data in Section 3 entitled, 'Defence Demand for Naval Shipbuilding and In-Service Support'. As the updated *Defence Capability Plan* amends some of the project plans and schedules, Defence has updated Section 3 of the original submission to reflect the latest Defence plans.

Hence, I enclose this updated Section 3 and ask that it replace the original Section 3 previously forwarded.

The Defence point of contact for this submission is Rear Admiral Trevor Ruting, Head Maritime Systems Division on telephone: (02) 6265 2705.

Yours sincerely

BRENDAN NELSON  
Encl



## SECTION 3. DEFENCE DEMAND FOR NAVAL SHIPBUILDING AND IN-SERVICE SUPPORT

3.1 Over the next 20 years Defence will be required to construct maintain and upgrade its Naval Fleet. With respect to construction, the Defence Capability Plan (DCP) includes provision for the construction of Air Warfare Destroyers (AWDs), Amphibious-Landing Helicopter Dock (LHD) ships, Afloat Support ships, Patrol Boats and Watercraft. Post DCP, it is anticipated that Defence will need industry to commence work on a future Frigate, Submarine and minor war vessel program from about 2018 onwards.

3.2 With respect to maintenance (ie. in-service support) Defence will be required to maintain its current fleet of major surface combatants, submarines, amphibious and afloat support ships and minor war vessels until they are replaced or withdrawn from service. In-service support will also be required for the new AWD, LHD and Afloat Support ships from about 2013. With respect to upgrade work, Defence will, over the next 15 years, continue to upgrade its major surface combatants (FFG and ANZAC frigates), Minor War Vessels and Collins Class submarines to maintain capability and ensure that they remain operationally effective.

3.3 Defence demand can be expressed in two ways, namely by expenditure or by workforce requirements. Each of these aspects of Defence demand is examined below.

### Defence Expenditure

3.4 Based on current planned projects and likely future unplanned projects, Defence expenditure on ship programs over the next two decades is estimated at approximately \$30.5 billion. This can be broken down into approximately \$10.5 billion of approved and DCP nominated construction and upgrade projects (ie. AWD, LHD, Afloat Support, Anzac and FFG Upgrade), approximately \$14 billion for in-service-support of the current naval fleet, and approximately \$6 billion for anticipated post DCP projects for the future frigate and submarine. This demand is represented in Figure 4 and is based on estimates that assume earliest possible AWD and LHD delivery first ships in the 2012-2013 timeframe.

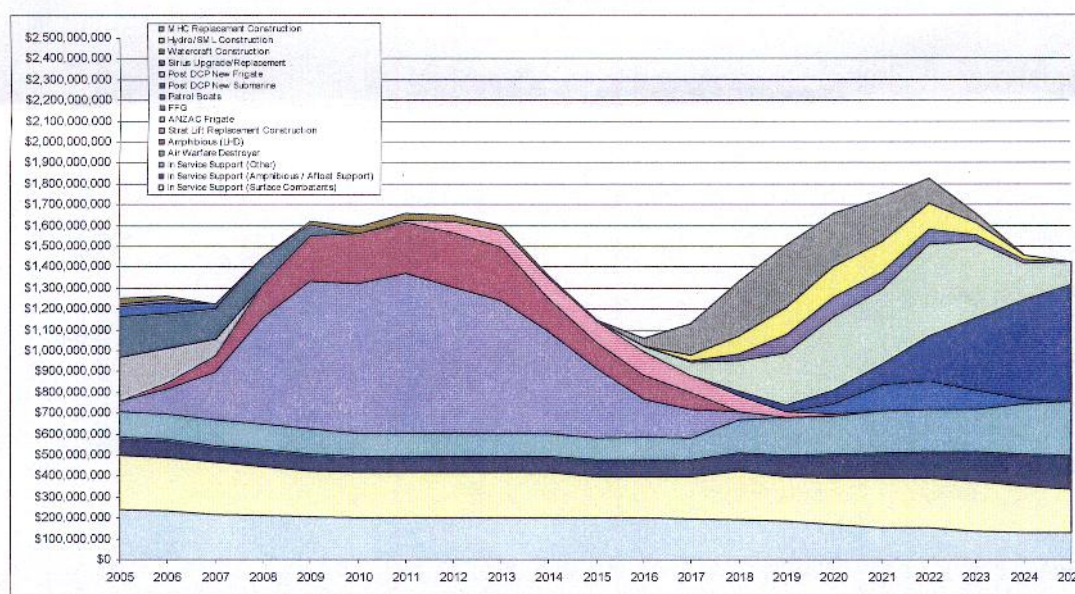


FIGURE 4: ESTIMATED DEFENCE EXPENDITURE BY PROJECT (2005 – 2025)



3.5 If all of this work was to be managed in country, it is estimated that approximately 63%, or \$19 billion, would be spent locally. The proportion of local expenditure differs on a project by project basis. Major combat and weapon systems are typically acquired from overseas suppliers and, as such, these projects have a lower proportion of local expenditure. In-service support activities typically involve the highest level of local expenditure. The anticipated level of local expenditure by project / activity is represented in Figure 5. The difference between total and local expenditure is represented in Figure 6.

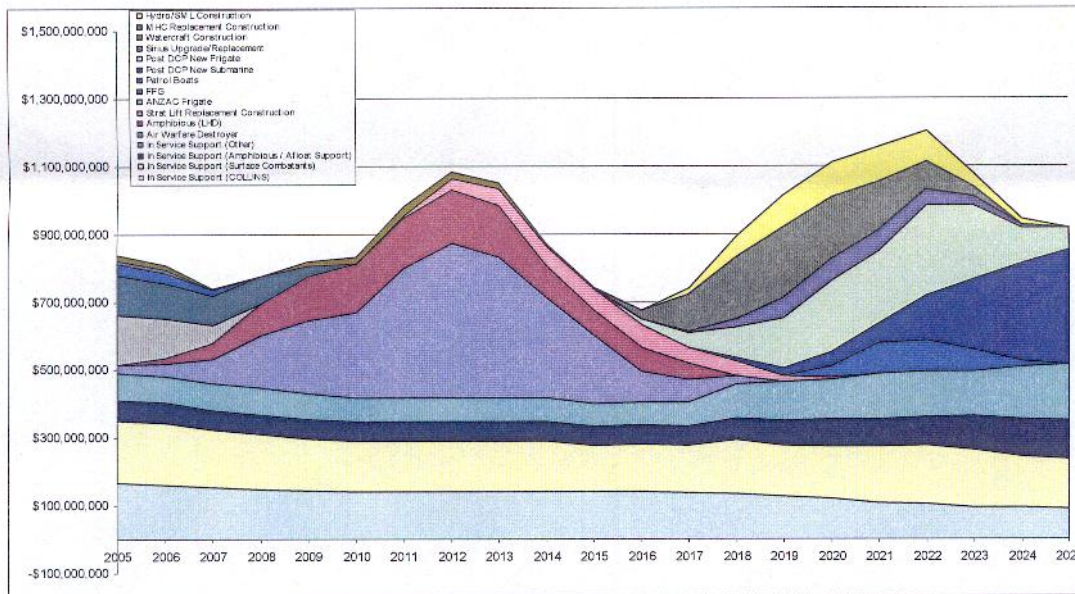


FIGURE 5: ANTICIPATED LOCAL DEFENCE EXPENDITURE BY PROJECT (2005 – 2025)

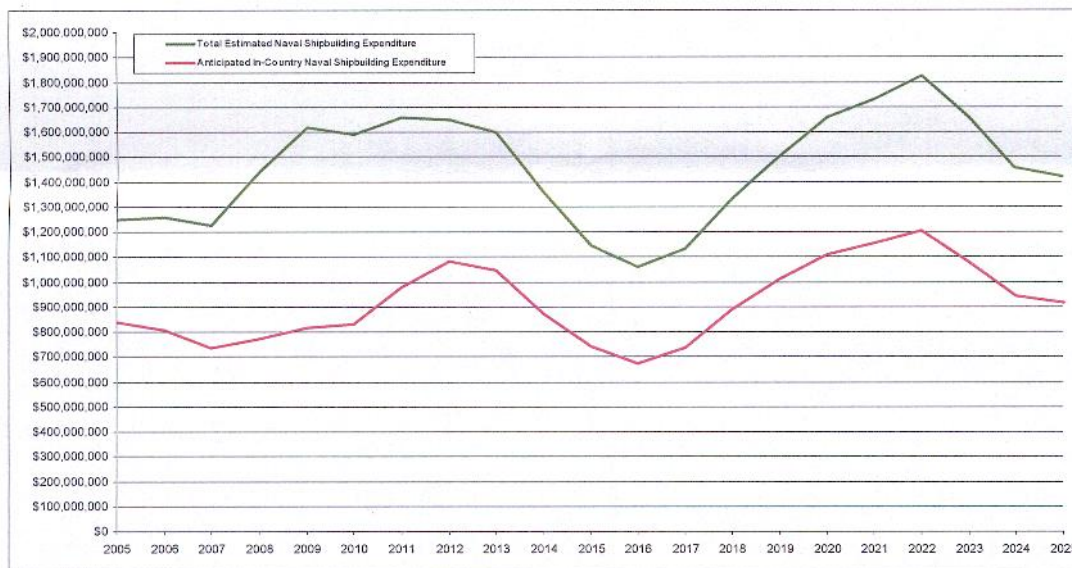


FIGURE 6: TOTAL AND ANTICIPATED LOCAL EXPENDITURE (2005 – 2025)

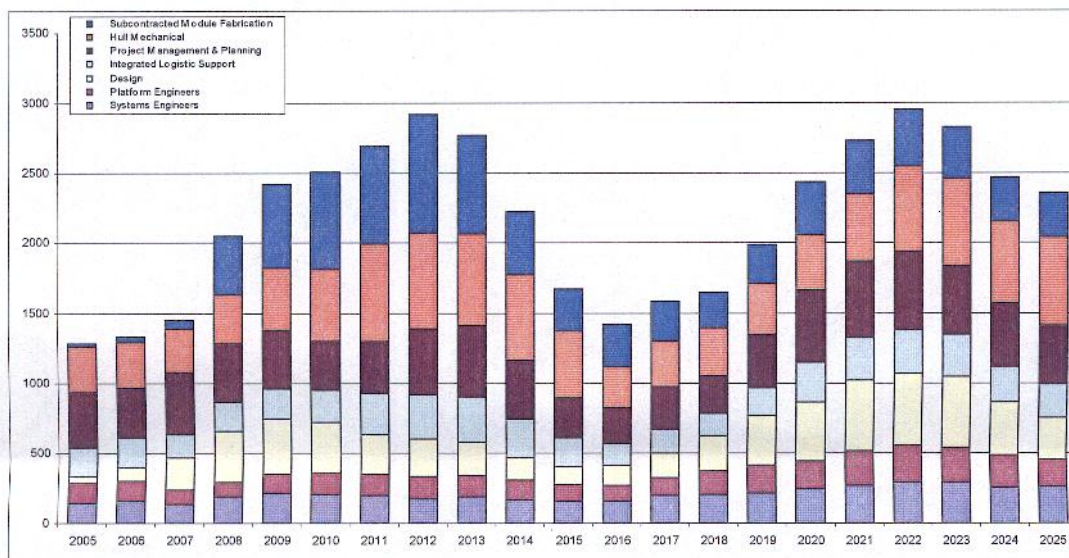


## Total Workforce Requirements

3.6 Defence demand can also be expressed in terms of workforce requirements. This provides a more detailed indication of what skill sets are needed over what timeframes to construct, upgrade and support the Naval Fleet to the required capability levels. For the purpose of this analysis, the naval shipbuilding and repair skill sets have been classified into seven broad categories, namely:

- Systems Engineering,
- Platform Engineering,
- Design,
- Integrated Logistic Support,
- Project Management and Planning,
- Hull and Mechanical Construction, and
- Subcontracted Module Fabrication.

3.7 The Workforce requirement figures were obtained from estimates provided by the relevant Defence project and in-service support areas, work undertaken on the 2003 Naval Shipbuilding and Repair Sector Plan, and from workforce numbers provided by the major Australian naval shipbuilders dedicated to the Defence demand. The workforce requirements for naval construction and upgrade work by skill sets and by projects are provided at Figures 7 and 8 respectively.

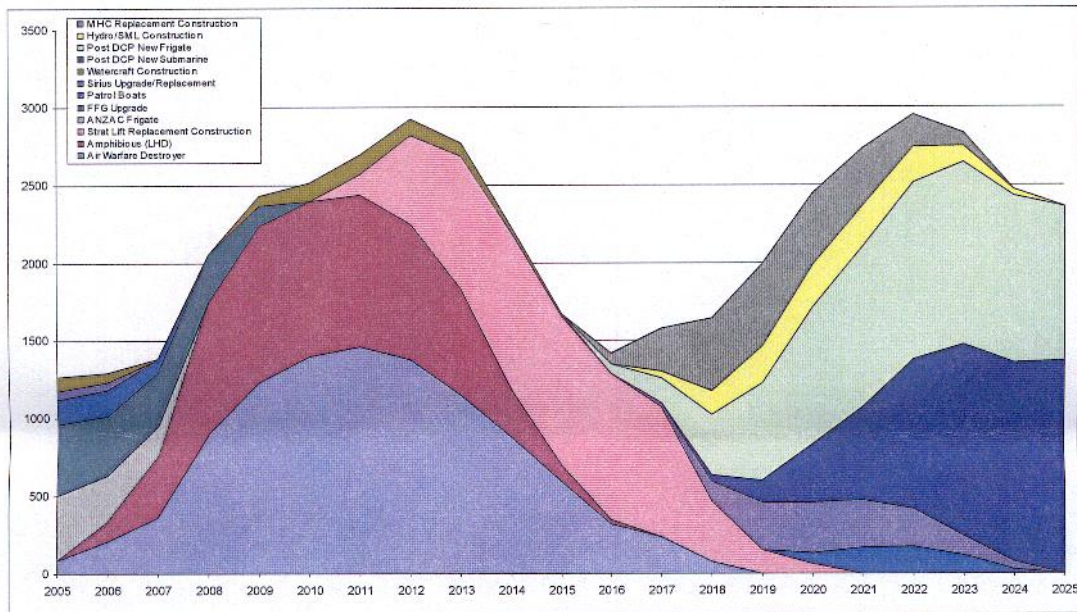


**FIGURE 7: WORKFORCE REQUIREMENTS (SKILL SETS) – CONSTRUCTION AND UPGRADE WORK (2005 – 2025)**

3.8 Figure 7 clearly shows a major peak in Defence demand that translates to a doubling in construction and upgrade workforce requirements over a five-year period from 2008 to 2012. Specifically, workforce requirements will rise dramatically in 2008 with the commencement of construction work on the AWD, LHD and Afloat Support ships. These workforce numbers will peak at approximately 2900 in 2012 with the majority of the workforce increase in the Hull and Mechanical Construction and Module Fabrication skill sets. The workforce number will then drop from 2013, over a three-year period, as the new construction work winds down. Over this



three year period, the workforce numbers drop by 50% to approximately 1400 in 2016 and then rise as new naval shipbuilding programs (post-DCP) commence.

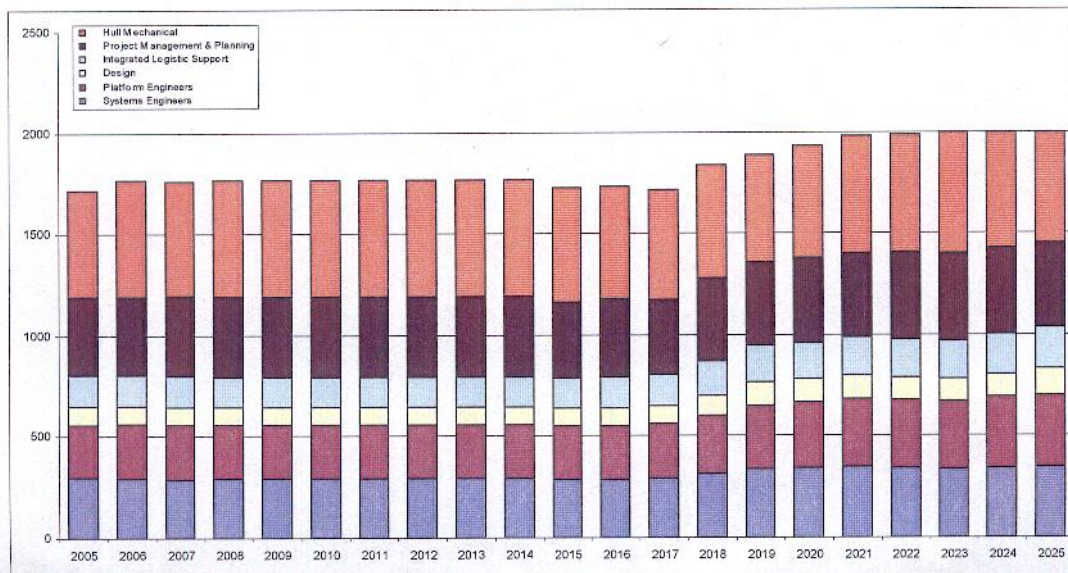


**FIGURE 8 WORKFORCE REQUIREMENTS (PROJECT) – CONSTRUCTION AND UPGRADE WORK (2005 – 2025)**

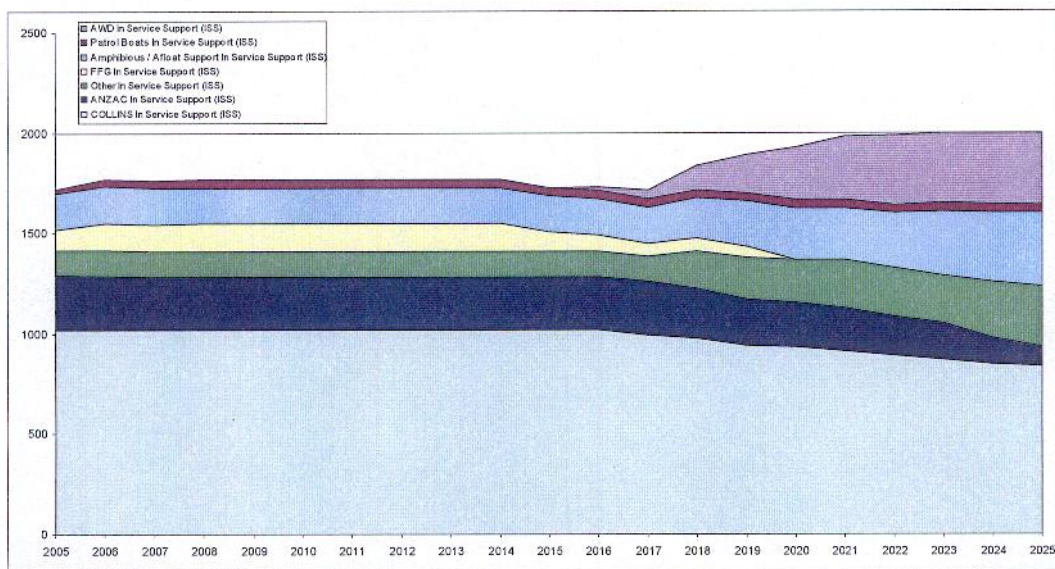
3.9 Figure 8 indicates that the AWD project will require approximately half (ie. 52% or 1370) of the construction and upgrade workforce during the four-year peak construction period (2009 to 2012), with LHDs and Afloat Support ships requiring the majority of the remaining workforce. Over the period 2013 to 2015 the workforce requirements are spread evenly over the AWD, LHD and Afloat Support ship projects. The figure shows a 50% decline in construction and upgrade workforce requirements over a 3-year period (2013 to 2016), which then increases from 2016 as new construction programs commence.

3.10 The workforce requirements for naval in-service support by skill sets and by projects are provided at Figures 9 and 10 respectively.





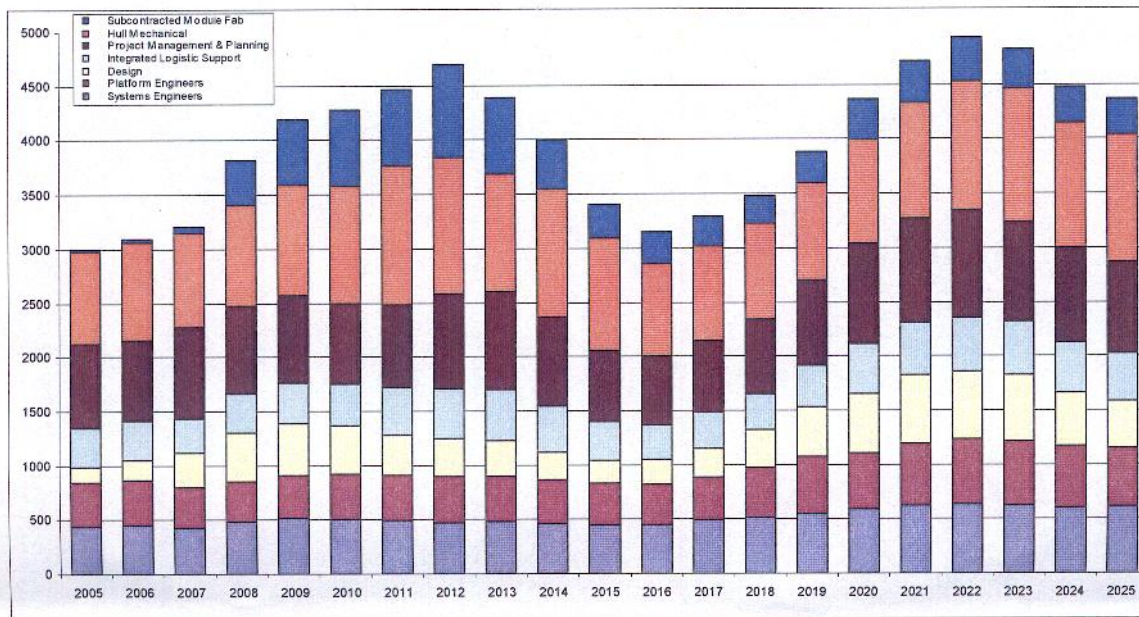
**FIGURE 9: WORKFORCE REQUIREMENTS (SKILL SETS) IN-SERVICE SUPPORT (2005 – 2025)**



**FIGURE 10: WORKFORCE REQUIREMENTS (PROJECT) – IN-SERVICE SUPPORT (2005 – 2025)**

3.11 Figures 9 and 10 indicate that in-service support workforce requirements are relatively constant over the next two decades with workforce ranging from approximately 1700 to 2000. A moderate increase from 2018 reflects the introduction of the AWDs into service, followed by the LHDs and Afloat Support ships. Submarine in-service support accounts for almost two thirds of the workforce requirements.

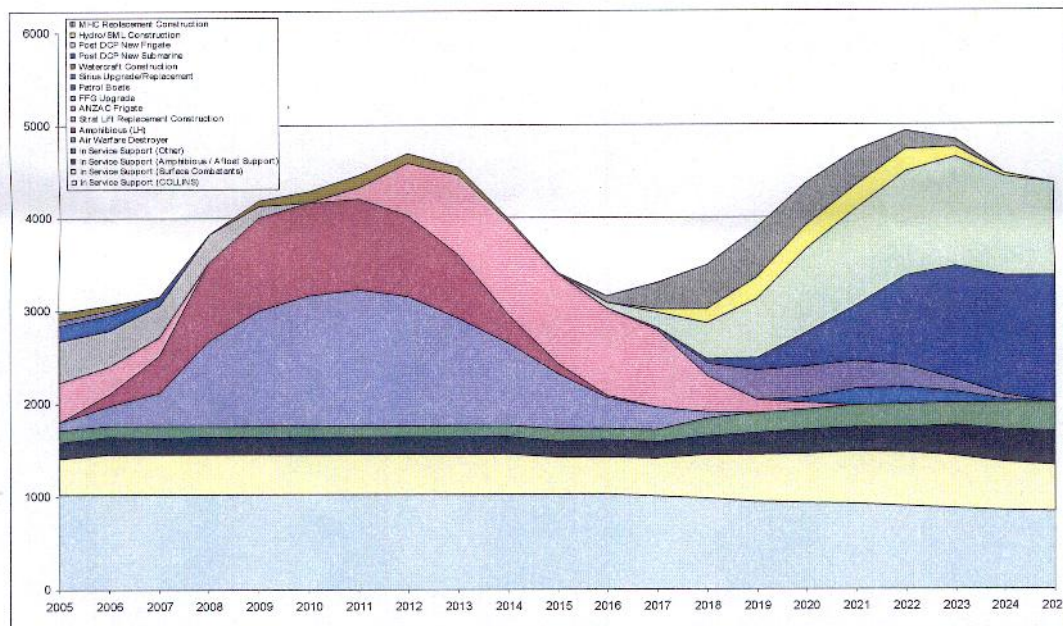
3.12 The total workforce requirements (ie. construction, upgrade and in-service support) by skill sets and by projects are provided at Figures 11 and 12 respectively.



**FIGURE 11: TOTAL WORKFORCE REQUIREMENTS BY SKILL SETS (2005 – 2025)**



Figures 11 and 12 represent approximately 84,000 naval shipbuilding and repair-person years. The figures again highlight a sharp rise in workforce requirements from 2008 to 2012 where demand increases by approximately 42 percent (ie. from an average workforce of 3100 to 4400). The peak workforce requirement of 4700 occurs in 2012 at the height of the AWD, LHD and Afloat support ship construction. Again, the majority of the workforce increase is in the Hull and Mechanical Construction and Module Fabrication skill sets. Both Figures highlight a 30% decline in Defence demand from 2013 to 2016 as the AWD, LHD and Afloat Support ship projects 'wind' down. Demand again steadily increases from 2016 as the next proposed major build programs commence.



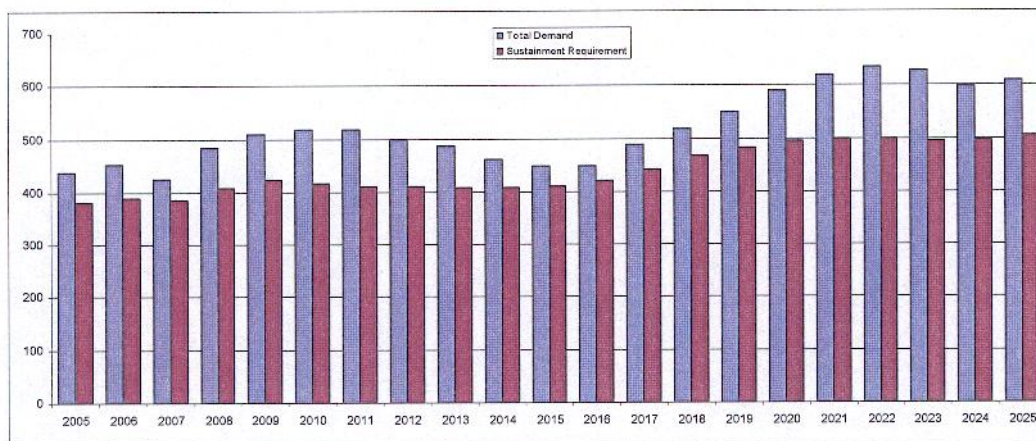
**FIGURE 12: TOTAL WORKFORCE REQUIREMENTS BY PROJECT (2005 – 2025)**

### Sustainment Requirements

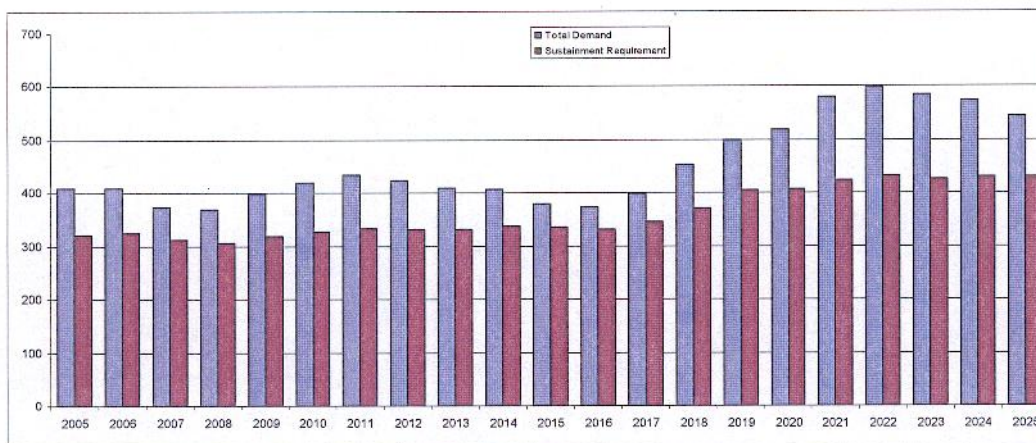
3.13 The above workforce figures provide an indication of the total workforce numbers required to construct, upgrade and support Australia's Naval Fleet to the required operational capability levels. However, from a Defence capability perspective, the primary reason for in-country construction is to provide for sufficient skills development, technology transfer and attrition management, to allow for an effective indigenous in-service support capability. A secondary reason is to provide for a core of capability, which can be built upon, should further in-country construction be deemed necessary. Accordingly, once a ship is constructed only a proportion of the associated skills are required for in-service support or future capability needs.

3.14 To this end, Defence has estimated the skills needed to meet the Navy's operational requirements. These estimates, defined as 'sustainment requirements', reflect the industry skills required by Defence to be able to maintain, upgrade and modify the Naval Fleet to the required operational capability levels. In essence, the 'sustainment requirement' includes all off 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. With respect to the required industry skills, the higher the skill levels the higher the estimated sustainment level (ie. Defence would seek to retain a higher proportion of System Engineering skills than Hull and Mechanical Construction skills). The 'sustainment requirement' estimates, which comprise 100% of the required in-service-support workforce plus a proportion of the construction workforce are detailed in Figures 13 to 19.

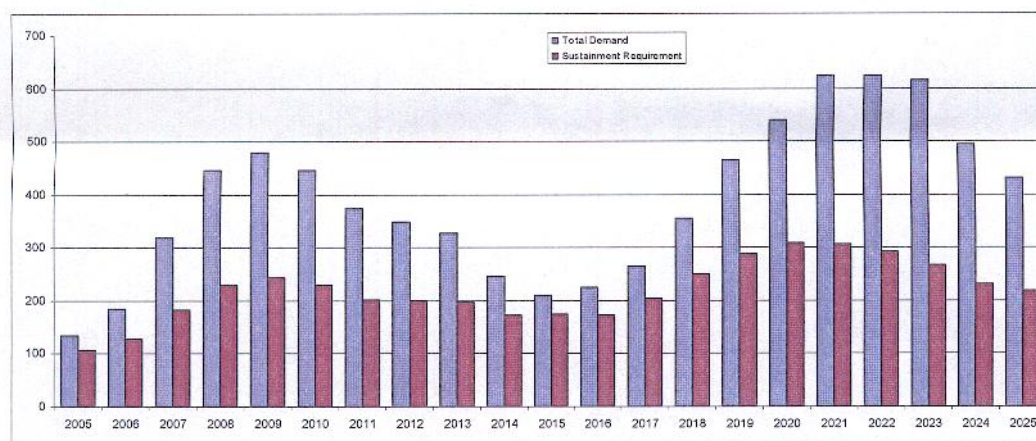




**FIGURE 13: SYSTEM ENGINEERING – SUSTAINMENT REQUIREMENTS (2005 – 2025)**

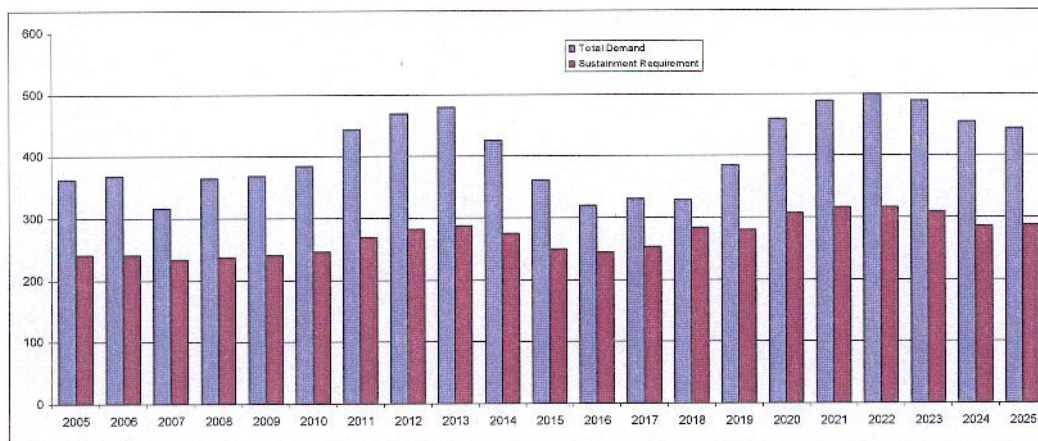


**FIGURE 14: PLATFORM ENGINEERING–SUSTAINMENT REQUIREMENTS (2005 – 2025)**

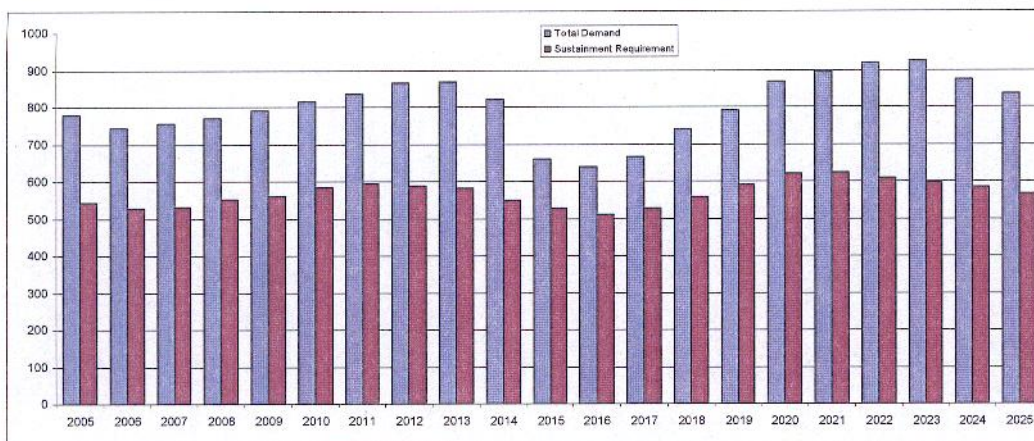


**FIGURE 15: DESIGN – SUSTAINMENT REQUIREMENTS (2005 – 2025)**

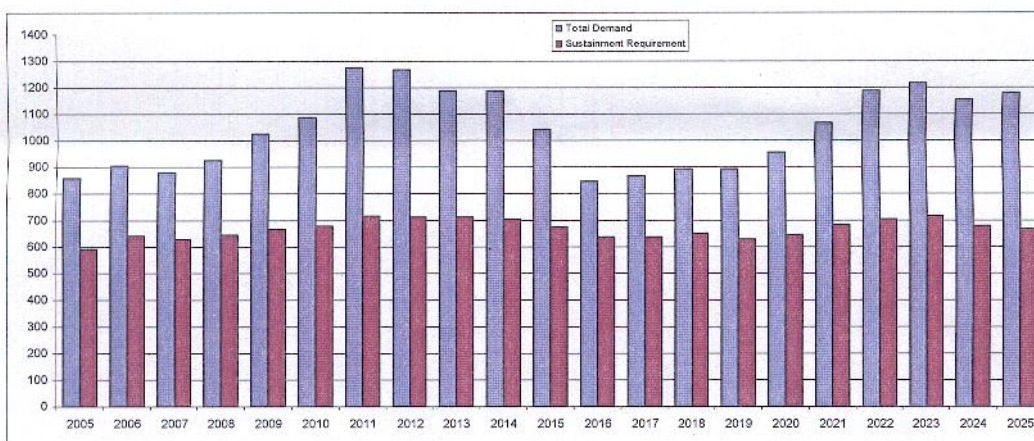




**FIGURE 16: INTEGRATED LOGISTIC SUPPORT – SUSTAINMENT REQUIREMENTS (2005 – 2025)**

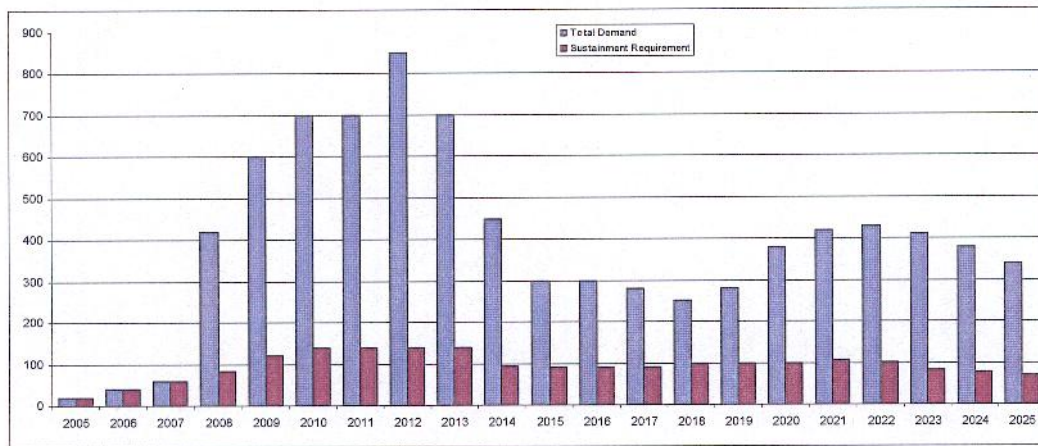


**FIGURE 17: PROJECT MANAGEMENT & PLANNING – SUSTAINMENT REQUIREMENTS (2005 – 2025)**



**FIGURE 18: HULL AND MECHANICAL CONSTRUCTION – SUSTAINMENT REQUIREMENTS (2005 – 2025)**

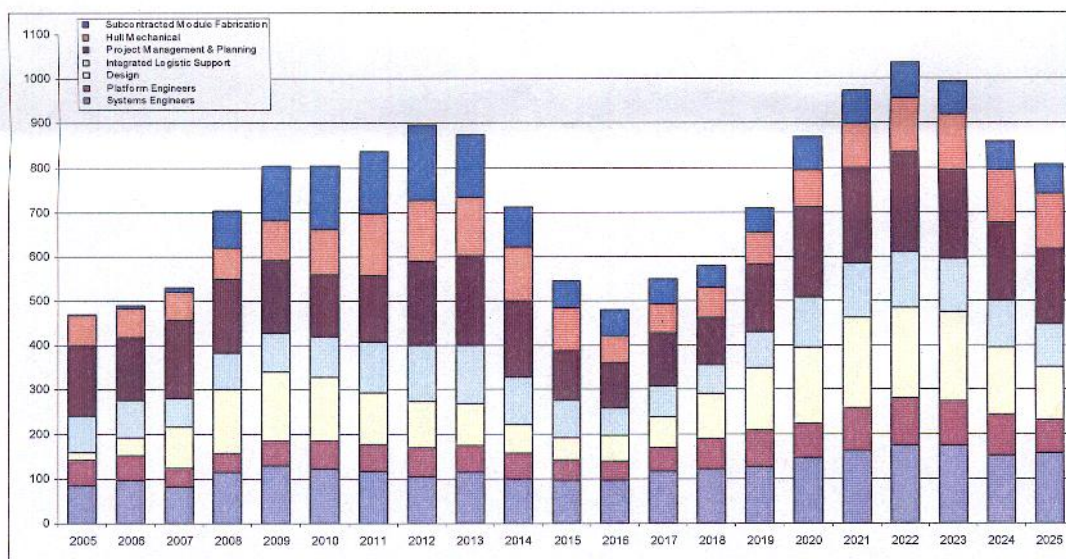




**FIGURE 19: SUBCONTRACTED MODULE FABRICATION – SUSTAINMENT REQUIREMENTS (2005 – 2025)**

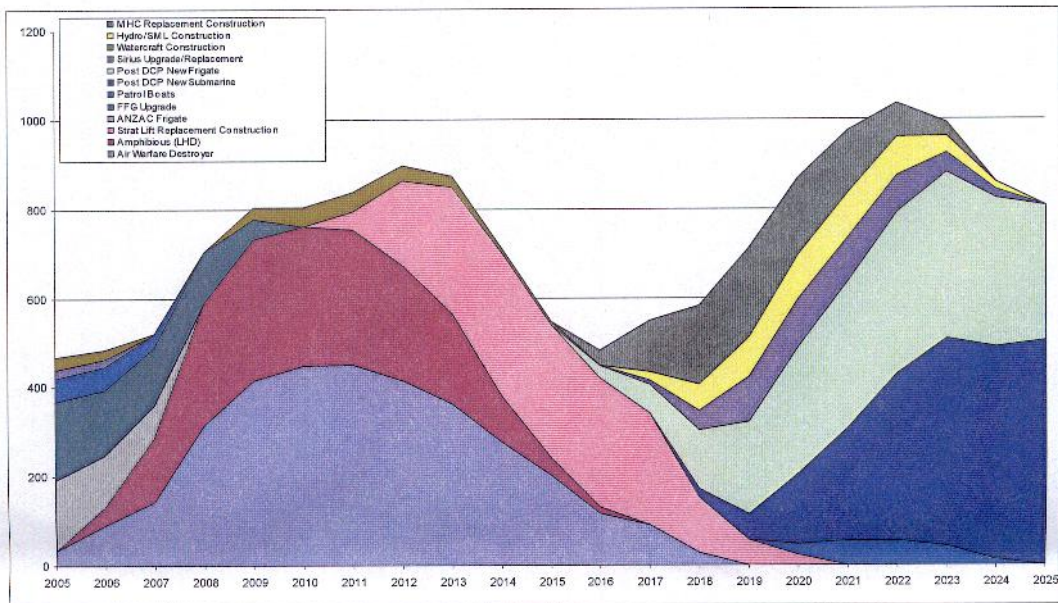
3.15 Figures 13 to 19 indicate that only a proportion of the naval construction workforce needs to transition into the in-service support workforce to meet operational requirements. The proportion of skills to be transitioned depends on the nature of the skills. System Engineering (Figure 13) and Platform Engineering (Figure 14) 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 (Figure 15), Integrated Logistic Support (Figure 16) and Project Management / Planning (Figure 17), whilst important skills, are not required for sustainment purposes at the same proportions as the high-end specialist skills. Hull and Mechanical Construction (Figure 18) and Subcontracted Module Fabrication Skills, whilst critical for construction, are not required at high-levels for in-service support and capability sustainment.

3.16 The sustainment requirement from naval construction and upgrade work, by skill sets and projects, (ie. the workforce numbers that will need to transition into in-service support activities), are provided in Figure 20 and Figure 21 respectively.



**FIGURE 20: SUSTAINMENT REQUIREMENTS (SKILL SETS) – CONSTRUCTION AND UPGRADE WORK (2005 – 2025)**

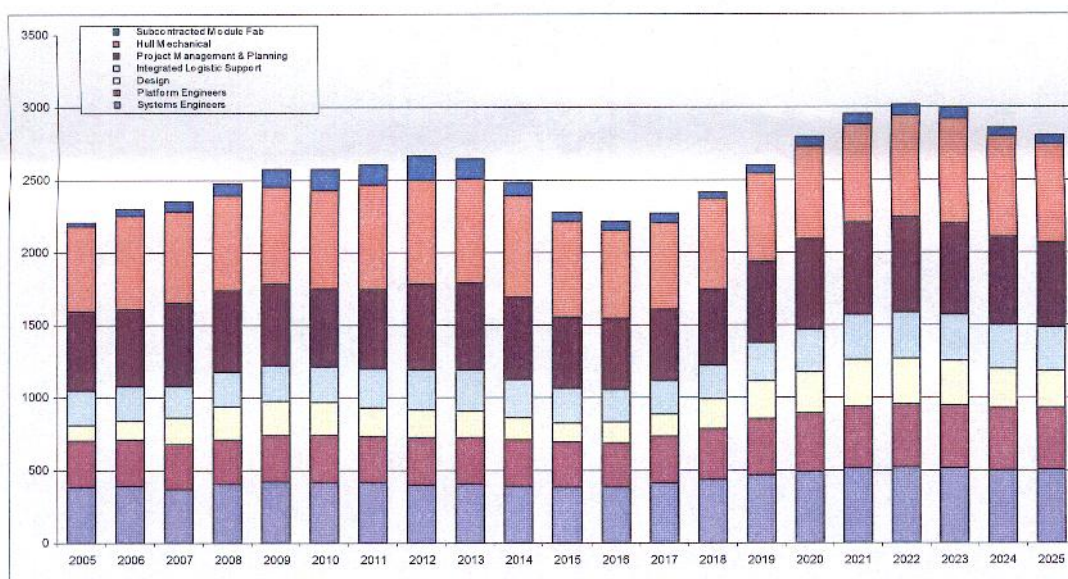




**FIGURE 21: SUSTAINMENT REQUIREMENTS (PROJECT)  
– CONSTRUCTION AND UPGRADE WORK (2005 – 2025)**

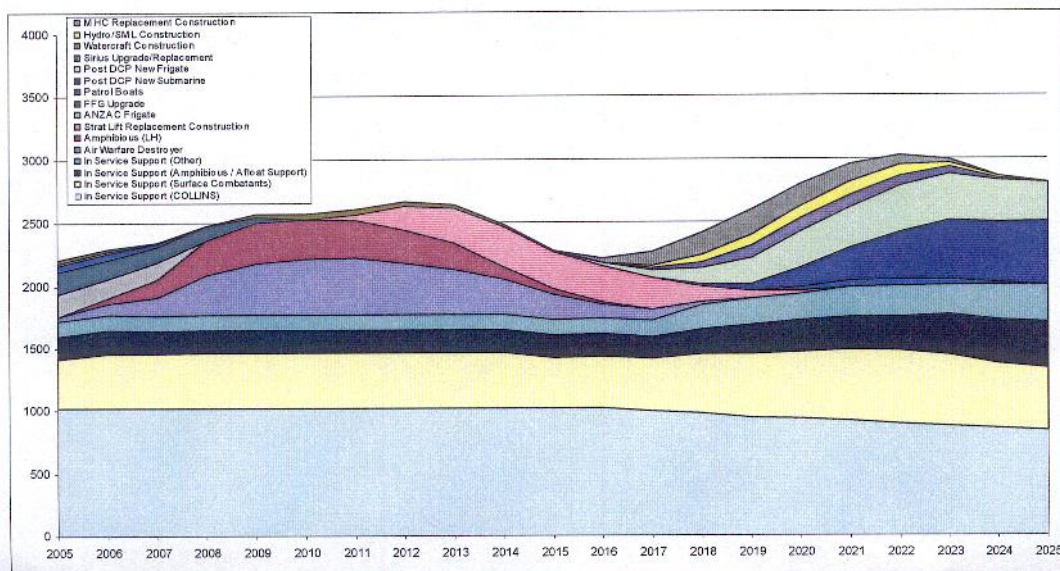
3.17 In comparison with Figures 7 and 8 (indicating the total workforce requirement for naval construction and upgrade work), Figures 20 and 21 represent a 67% reduction in workforce numbers. Specifically, Figures 20 and 21 indicate that Defence only needs to retain about one third of its total construction and upgrade workforce to meet its operational sustainment requirements (ie. in-service support, attrition and future capability needs).

3.18 The total sustainment requirement (ie. construction, upgrade and in-service support), by skill sets and projects, are provided in Figure 22 and Figure 23 respectively.



**FIGURE 22: TOTAL SUSTAINMENT REQUIREMENTS BY SKILL SETS (2005 – 2025)**





**FIGURE 23: TOTAL SUSTAINMENT REQUIREMENTS BY PROJECT (2005 – 2025)**

3.19 Once again, Figures 22 and 23 need to be considered in comparison to Figures 11 and 12 (indicating the total workforce requirement for all naval shipbuilding and repair work). Figures 22 and 23 represent a 37% reduction in the total naval shipbuilding and repair workforce requirements detailed in Figures 11 and 12. Specifically, Figures 22 and 23 indicate that Defence's sustainment requirement is, on average, approximately one third less than Defence total workforce requirements. As would be expected, the reduction is even more pronounced (up to 50%) over the peak construction period (2007 – 2013).

## Discussion

3.20 Over the next two decades, Defence requires a significant amount of naval construction, upgrade and in-service support work. If this work is to be managed in-country it will place a significant burden on available naval shipbuilding workforce resources. Specifically, the peak construction period (AWDs, LHDs and Afloat Support ships) from 2008 to 2013 will require a 50% increase in workforce numbers (see Figures 11 and 12). This is a significant workforce 'peak' that will be hard to meet. Poaching from the in-service support resource pool is to be avoided at all cost as it would likely reduce the operational effectiveness of the current naval fleet.

3.21 If Australian industry was to meet the challenge and provide sufficient workforce numbers to meet Defence's demand, the next question that arises is what will happen to the workforce when it rapidly constricts post 2013. Specifically, is it feasible and cost effective to increase naval shipbuilding workforce numbers by 50% for a six-year period from 2008 to 2013 and then reduce it again by 50% over the next three-years (2014 – 2016)? History would suggest that the non-recurring expenditure and workforce training / redundancy costs associated with such a large workforce 'peak' and 'trough' will inevitably be met by Government.

3.22 It is important to note that, from a Defence capability perspective, in-country construction is a means to an end. Specifically, it provides for sufficient skills development, technology transfer and attrition management, to allow for a cost effective indigenous in-service support capability. It also provides for a sufficient core capability to meet any future naval shipbuilding requirements. Defence refers to this as its 'sustainment requirement'.

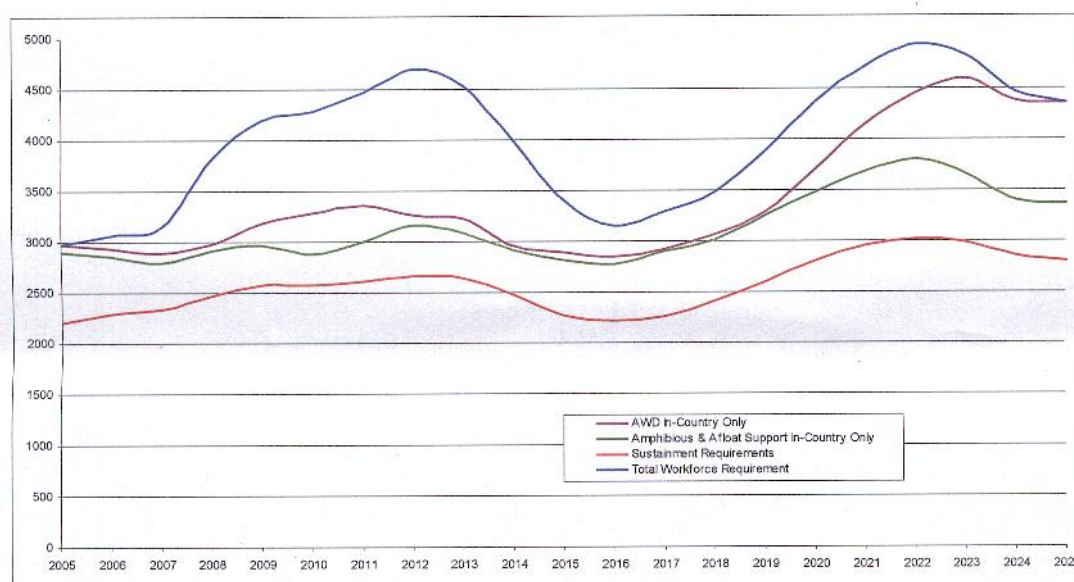


3.23 Projected workforce skill estimates indicate that Defence's 'sustainment requirement' is about one third of the new construction and upgrade workforce requirements (Figures 20 & 21); or about two thirds of Defence's total construction, upgrade and in-service support workforce requirements (Figures 22 & 23). This raises an interesting question, namely, whether or not the AWDs, LHDs and Afloat Support ships need to all be built in Australia to meet Defence's total sustainment requirement.

3.24 Figure 24 provides an indication of the total workforce requirements in comparison to Defence's sustainment requirements. Included in this figure is an indication of the workforce requirements if only AWDs are built in Australia and a similar indication of the workforce requirements if only the LHDs and Afloat Support ships are built in Australia. This figure suggests that either build program on its own is likely to provide sufficient workforce numbers to meet Defence's sustainment requirement. This noted, the AWD program is likely to provide more of the scarce, high-end skills (ie. Systems and Platform Engineering) required by Defence to meet its sustainment needs.

3.25 Figure 24 is not intended to infer that the AWDs, LHDs and Afloat Support ships should not all be constructed in-country. Rather, it is intended to highlight that if Defence's sustainment requirement is a key objective of an in-country construction program, then it is not necessary to build the AWDs, LHDs and Afloat Support ships all in Australia to meet that sustainment requirement.

3.26 Such a situation (ie. In-country build of only AWD or only LHD/Afloat Support) would also be likely to have a positive impact on program cost. 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.



**FIGURE 24: TOTAL WORKFORCE, SUSTAINMENT AND IN-COUNTRY BUILD PROJECT REQUIREMENTS (2005 – 2025)**