

# Chapter 10

## The comparative economic costs of maintaining, repairing and refitting large naval vessels throughout their useful lives when constructed in Australia vice overseas

### Background

10.1 When considering the costs of an acquisition, many witnesses emphasised the need to take account of the through-life expenses which are many times greater than the initial cost of acquisition. Most accepted that the rule of thumb applying to large constructions, including a typical warship, is 30 per cent in initial acquisition costs compared with 70 per cent through-life support (TLS) costs.<sup>1</sup> This chapter examines the comparative economic costs of maintaining, repairing and refitting large naval vessels throughout their working lives when constructed in Australia against an overseas build.

### Through-life costs

10.2 The 2006 ACIL Tasman report noted that the Navy requires an in-country capability to undertake repair and maintenance. It noted further that this requirement is not only because of strategic and operational issues but also a result of personnel policies for crew leave and training.<sup>2</sup> It came to the conclusion:

Because ship and submarine repair and maintenance must for the most part be performed in Australia and are constrained by home porting and capability sustainment in the repair and maintenance sector international comparisons would provide minimum insights into productivity in the Australian repair and maintenance context.<sup>3</sup>

10.3 Defence confirmed unequivocally that Navy requires major support for its warship to be conducted in or near the ship's home port.<sup>4</sup> It identified two important considerations that Navy requires:

- the advantages and reduced impact on ship's company of conducting ship support and crew rest and recreation in parallel; and

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1 See for example, Nautronix, *Committee Hansard*, 3 April 2006, p. 36; the Western Australian government, *Committee Hansard*, 3 April 2006, p. 85; Department of Defence, *Submission 20*, p. 28 (para 5.6) and Graham Harris, *Committee Hansard*, 27 April 2006, p. 24; Susan Smith, Executive Officer, Australian Industry and Defence Network Inc, *Committee Hansard*, 27 April 2006, p. 29; ADI, *Committee Hansard*, 28 June 2006, p. 7.

2 ACIL Tasman, *Naval shipbuilding in Australia: a background briefing*, 9 February 2006, p. 49.

3 ACIL Tasman, *Naval shipbuilding in Australia: A background briefing*, 9 February 2006, p. 49.

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

- proximity to support infrastructure such as ammunition point, ranges and fleet assets, necessary to work up the crew and platform after maintenance.

10.4 It explained:

Navy's requirement does not prevent maintenance being conducted at repair facilities that are not in the proximity of the ship's operational base. It is sometimes necessary to conduct maintenance at other locations. For example,

- Collins class Full Cycle Docking maintenance is conducted at Osborne in South Australia as a consequence of a Federal Government decision to retain the relevant skills developed during the build program...;
- because warships can be deployed anywhere in the world, Navy has successfully conducted major repair activities at many facilities remote from the ships' home port.<sup>5</sup>

10.5 Defence made clear that while it is not essential to have a repair facility close to a ship's home port it is 'desirable' to meet Navy's requirements'. Given that Defence requires its naval fleet to be repaired and maintained in Australia, the extent to which an in-country build influences these through-life costs is a significant consideration.

*The lack of data*

10.6 The lack of sufficient data prevented the committee from obtaining any sensible or reliable statistics on the comparative economic productivity of building a naval vessel in-country compared with overseas. The same difficulty confronts the committee in endeavouring to determine the comparative costs of TLS for large naval vessels when constructed in Australia vice overseas. As ASC's submission noted:

In nearly every case Australia has built significantly different ships to those built elsewhere and coupled with the fact that comparative pricing data rarely exists, assumptions about life-cycle costing and the relative costs of through-life support differ.<sup>6</sup>

10.7 Despite this lack of data, many witnesses took the view that there was a strong connection between savings that could be made repairing and maintaining a ship in Australia if that ship were built in-country.

10.8 As noted in the previous chapter, the Allen Consulting Group report queried the cost savings that would accrue to the AWDs and the LHDs because of the small production run. It nevertheless accepted that if the ships were not built in Australia the capability to maintain and provide TLS may be compromised. The 2006 ACIL

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5 Department of Defence, question 1, answer to written question on notice following hearing on 28 March 2006.

6 *ASC Submission 17*, p. 14. See also Government of South Australia, *Submission 9*, paragraph 6.8.1, p. 27.

Tasman report suggested that linkages between shipbuilding and TLS can be very important to the productivity and cost of ship repair and maintenance.<sup>7</sup>

10.9 It cited findings from its 2002 study which showed that the in-service support benefits associated with the arrangements established for the Minehunters included:

- cost savings for Defence in money and resources for in-service support;
- shorter turn around times than out of country support, particularly in times of international crisis;
- increased effectiveness during operations with a 24 hour technical enquiry service;
- opportunities for value adding such as the multi-functional system team approach used by ADI and Thales Underwater Systems to support the Minehunter Coastal Vessels;
- development of related and supporting industries that create alliances between systems suppliers and contractors which improve local capability to deliver repair and maintenance services; and
- ability to provide more consistent employment for specialist skills in systems, systems integration and application.<sup>8</sup>

10.10 These findings are consistent with the general view of a number of submitters who suggested that savings are made on TLS if the ship is produced in-country. They highlighted the importance of taking account of the advantages gained for TLS by building in-country.<sup>9</sup>

10.11 Rear Admiral (Ret'd) W. J. Rourke argued that the costs of maintaining, repairing and refitting ships that have been constructed in Australia will be significantly less than the costs of maintaining ships constructed overseas.<sup>10</sup> Drawing on past performance, the Submarine Institute of Australia noted that construction in Australia of naval vessels (including the Collins class submarines) generated significant economic and other benefits including the prospect of ensuring adequate through-life support of the vessels.<sup>11</sup>

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7 ACIL Tasman, *Naval shipbuilding in Australia: A background briefing*, 9 February 2006, p. 50

8 ACIL Tasman, *Naval shipbuilding in Australia: A background briefing*, 9 February 2006, p. 51.

9 See for example, Graham Harris, *Committee Hansard*, 27 April 2006, p. 24; Susan Smith, Executive Officer, Australian Industry and Defence Network Inc, *Committee Hansard*, 27 April 2006, p. 29; ADI, *Committee Hansard*, 28 June 2006, p. 7; Australian Academy of Technological Sciences and Engineering (ATSE), *Submission 19*, p. 3; DISplay, *Submission 40*, pp. 4 and 5.

10 *Submission 1*, p. 5.

11 *Submission 3*, p. 13.

10.12 Saab Systems Pty Ltd also asserted that 'the long term economic outcome is that Australian based support for the life of a ship is much cheaper than foreign based support or introduction of a new development or support facility into Australia'.<sup>12</sup> Mr Mark Proctor, Business Development Manager, Saab Systems Pty Ltd, added:

The greatest cost of a warship is the cost of support and upgrade provided during its working life. This is most economically provided from Australian based organisations whose origins need to be during the construction and initial delivery phase.<sup>13</sup>

10.13 ASC concurred with the view that generally it would cost more to maintain, repair and refit a foreign-built vessel than one produced domestically.<sup>14</sup> More specifically, Thiess Pty Ltd argued:

Repairing ships built overseas can cost 2 to 3 times as much as maintaining in country. The offshore scenario does not provide repairs or parts at short notice and does not provide or retain the adequate expertise to diagnose problems in very complex ships. Repairs of battle damaged ships or major change of use of ships cannot be accommodated if industry is not building the ships in country.<sup>15</sup>

10.14 The Australian Industry Defence Network Inc submitted that the 'ability of Defence to rely on local sources for repairs, maintenance and spares will lead to substantial reductions in repair turnaround times...which will have an impact on the quality and overall costs of stock holdings'. It also stated that 'beyond repair and maintenance, involvement in the construction phase will position many Australian companies to play an active role in subsequent upgrades'.<sup>16</sup>

10.15 The Victorian government also pointed to the cost savings gained during the working life of a vessel if it is constructed in country. It argued that familiarity and experience with the warships results in more efficient through life support.<sup>17</sup> The Government of Western Australia agreed with this view. The Hon. Mr Francis Logan, the Western Australian Minister for Energy, Science and Innovation, explained:

There is no doubt that the through-life costs will go up if the corporate memory, the knowledge, the skills and the intellectual property is not contained in the place where the ship will eventually undertake its service.<sup>18</sup>

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12 *Submission 25*, p. 7.

13 *Submission 25*, p. 7 and *Committee Hansard*, 20 April 2006, pp. 2–3.

14 *Submission 17*, p. 19.

15 *Submission 22*, p. 3.

16 *Submission 2*, pp. 2–3.

17 *Submission 31*, p. 5.

18 *Committee Hansard*, 3 April 2006, p. 85.

10.16 While many submitters maintained that the economic costs of maintaining, repairing and refitting large naval vessels throughout their useful lives is greatly lessened by constructing those vessels in Australia, they did not produce statistics to substantiate this assumption.

### ***The ACIL Tasman estimate***

10.17 In broad quantitative terms, the main guide for the committee on this issue is the modelling by ACIL Tasman. The February 2000 report, *A Case Study of the ANZAC Ship Project*, found that:

- local or overseas supply is determined on a case by case basis: items that are part of pools through which components are rotated may be most economic to acquire from overseas; items that are uniquely developed or depend on timeliness of supply are often sourced locally;
- the cost of repairs, maintenance and spares is cheaper if the original source of supply is local because of shorter repair turn around times for locally produced items. Shorter repair turn around times mean a lesser quantity and overall cost of spares that need to be held;<sup>19</sup> and
- the ANZACs' annual repair costs of \$45 million could be higher by a factor of two if the original source of supply had been overseas. Assuming a long term bond rate of 7.12 per cent over a repair period of 25 years, the estimated repair cost saving is A\$518 million.<sup>20</sup>

10.18 It should be noted that Ms Denise Ironfield, the author of the reports on the Minehunters and the ANZACs, informed the committee that despite her efforts to obtain information from Defence, she had no government data but was given 'very comprehensive information by Tenix and ADI', the respective primes.<sup>21</sup> She explained that she spoke to Defence:

...I was trying to get some information from them on through-life support issues. Both reports were very interested in the through-life aspects of Australian industry involvement. However, in both instances it was extremely difficult to get very much information from the Department of Defence on the implications of the Australian build on through-life support.<sup>22</sup>

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19 Tasman Asia Pacific, February 2000, *Impact of Major Defence Projects: A case study of the ANZAC Ship Project*, pp. 38–39.

20 Tasman Asia Pacific, February 2000, *Impact of Major Defence Projects: A case study of the ANZAC Ship Project*, pp. 49–50. The figure is reached by deducting 7.12 per cent from the principal (\$45 million in year one) for each of the 25 years.

21 *Committee Hansard*, 3 July 2006, p. 89.

22 *Committee Hansard*, 3 July 2006, p. 90.

*The Department of Industry response*

10.19 The Department of Industry, Tourism and Resources' (DITR) submission to this inquiry questioned some of the findings from the ANZAC study and made the following points regarding comparative costs of TLS:

- Domestic equipment can be installed in Australia for an overseas build. So, even with an overseas build, the costs and problems with maintaining overseas sourced equipment can be avoided.
- ACIL Tasman's repair savings figure of A\$518 million for the ANZAC project must be discounted by the proportion of Australian produced equipment that would be sent overseas to support an offshore build of the same vessel or fitted when the ship arrives in Australia. If this proportion is half, then the repair cost saving from the in-country build is A\$259 million (half of A\$518 million).
- The ACIL Tasman long-term government bond rate of 7.12 per cent underestimates the risk—a 10 per cent rate is more appropriate which reduces the savings estimate to \$408 million.
- Australian built ships will still depend on some overseas sourced equipment.
- Factors other than the source of initial construction supplies are significant in minimising repair costs. These include automated processes in the vessel design to reduce the whole of life crew costs and access to intellectual property (IP) for repair.
- Developing the in-country skills and knowledge for repair and maintenance does not depend on the location of the build—personnel can be posted offshore to participate in the build. However, 'there are greater benefits (and risks) from conducting an onshore build of complex vessels than simple vessels'.<sup>23</sup>

10.20 The committee accepts that some proportion of foreign-built RAN vessels will be sourced from Australian supplies and generic supplies that can be readily replaced in Australia. To this extent, it notes DITR's claim that ACIL Tasman's estimate is inflated. The committee also understands that Australian-built ships will look to overseas sources for some products or services. According to Defence, however, a local build is far more likely to have higher Australian industry content than a foreign-built vessel, and is therefore more likely to have original parts in stock for repair.<sup>24</sup> It was of the view that:

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23 Department of Industry, Tourism and Resources, *Submission 38*, p. 15. See also ASC, *Submission 17*, p. 19.

24 Department of Defence, answer to question on notice, 28 March 2006 (received 29 May 2006) p. 9.

...the economic costs of maintaining, repairing and refitting large naval vessels throughout their useful lives is greatly lessened by constructing those vessels in Australia.

10.21 Ms Ironfield, in response to a question about the criticism of using the government bond rate of 7.12 per cent, noted that this figure was equal to the long-term rate in December 1999. She noted, however, advice from Defence contained in the report that:

...experience with other major defence projects constructed in Australia is that sourcing locally, rather than overseas, achieves substantial savings in repair turn around times and spare stock savings for a comparable operational availability. These savings can flow through to cost and productivity savings for Defence which in turn translates into improved welfare for the economy as a whole...<sup>25</sup>

10.22 She explained that given the ANZAC ships have a twenty-five to thirty year service life, savings of sourcing repairs and maintenance would be substantial. Furthermore, referring to the ACIL Tasman report, she told the committee:

...assuming overseas sourcing doubled annual costs for repairs, and maintenance, and spare holdings for the ANZAC ships, the saving to the Australian economy...would be the one quoted—that is, the \$515 million.<sup>26</sup>

10.23 In answer to a written question on notice from the committee, however, Defence stated that 'for a low to moderate technology basic platform like the Amphibious-LHD there is only a low correlation between build capability and sustain/upgrade capability'.<sup>27</sup> It considered that there could be relatively few savings in whole-of-life cost from choosing to build the LHDs locally. It expected that the greatest savings over the life of the ship would come from full access to and use of ship design and intellectual property across the entire capability. ASC also understood that while generally it would cost more to maintain, repair and upgrade a foreign-built vessel than one produced in-country, the savings would depend on circumstances of the specific case and in particular the complexity of the ship.<sup>28</sup>

#### *Skills, knowledge and intellectual property*

10.24 The availability of equipment is only part of the explanation for potential TLS cost savings from a local build. A broader reason is that an in-country build develops the skills and knowledge base needed for subsequent through life support.<sup>29</sup> ASC's submission stated that the challenges of repairing and maintaining a foreign-built

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25 *Committee Hansard*, 3 July 2006, p. 99.

26 *Committee Hansard*, 3 July 2006, p. 99.

27 Question 1, p. 3.

28 *Submission 17*, p. 19.

29 Australian Manufacturing Workers Union, *Submission 21*, p. 8.

vessel in-country depend on: the level of familiarity with key systems and original equipment manufacturers; access to the foreign shipbuilder and the ship's original drawings; and access to the parent navy's technical staff.<sup>30</sup> For example, it is more expensive to train labour to repair and upgrade a vessel that was built offshore than it is to employ the skills used in the construction phase for through-life support.

10.25 Several witnesses also argued that the greater the complexity of the warship, the greater the need to build in-country to develop the domain knowledge and skills for through-life support.<sup>31</sup> The committee notes that this is the rationale for Defence's support for building the complex AWDs in-country: it is much less enthusiastic to build the less complex LHDs in-country.

10.26 DITR, among others, suggested that these skills can be developed by posting local designers offshore during the construction phase. This arrangement would need to ensure that access is allowed to the offshore builder's resources.

10.27 An in-country build may not be without its own challenges for through-life support. Engineers Australia argued that there is often a challenge in sustaining in-country skills once the ship transitions from the construction phase into naval service.<sup>32</sup>

10.28 Contractual arrangements guaranteeing access to IP and design rights are important to cost-effective through-life support.<sup>33</sup> Gibbs & Cox Australia's submission noted that in-country design of warships will mean that the Commonwealth will have control over the amount of life cycle cost savings. Difficulties can arise with TLS costs when the IP is not Australian-owned. Most notably, ASC's resolution of a contractual issue with IP owner Kockums was crucial to enable it to secure the Collins class refit contract. As ASC's Managing Director Mr Greg Tunny told the committee, without the IP and the repair and refit contract 'ASC would not exist'.<sup>34</sup>

## Conclusion

10.29 The previous chapter concluded that given that overseas countries are unlikely to remove the various forms of assistance and protection given to their local naval shipbuilding industry, Australia's builders of large naval ships must compete on an 'unlevel playing field' to some extent. Evidence suggests, however, that the

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30 ASC, *Submission 17*, p. 19.

31 ASC, *Submission 17*, p. 19; DITR, *Submission 38*, p. 15; Engineers Australia, *Submission 24*, p. 23.

32 Engineers Australia, *Submission 24*, p. 24.

33 South Australian government, *Submission 9*, p. 21; Gibbs & Cox Australia, *Submission 10*, pp. 5–6.

34 Mr Greg Tunny, *Committee Hansard*, 19 April 2006, p. 9. The contract is worth \$125 million annually for 25 years.



comparative costs of producing a ship in Australia would improve when the total amount of the acquisition, including the ship's through-life support, is considered.

10.30 Indeed, many submitters produced strong and credible arguments that savings accrue to the repair and maintenance costs if the ship is constructed in-country. They include savings generated by the substantial reductions in repair turnaround times and the more efficient through-life support that results from familiarity and experience with the warships.<sup>35</sup>

10.31 Intuitively, these assumptions appear logical and sensible. However, the lack of data on this issue makes any reliable or accurate assessment difficult. ACIL Tasman has produced some figures which provided the basis for discussion. But even in these cases, the author of the studies noted that little government data was made available.

10.32 ACIL Tasman estimated that annual TLS costs could be twice as high if foreign supplies had sourced the ANZAC Ship Project. This is due to shorter repair turn around times and lower stocks of spares from local sources of supply. However, DITR noted that local equipment can be used for an overseas build, thereby avoiding the higher costs associated with repairing overseas-built ships in Australia. It argued that the ACIL Tasman TLS estimate must be discounted by the proportion of equipment that could be sent overseas to support an offshore build of the same vessel.

10.33 The committee also accepts that through life support productivity savings from an in-country build derive in large measure from developing the skills and knowledge during the construction phase needed for this support. It notes that measures can be taken to compensate for the skills and knowledge deficiency should the ship be built overseas. For example, personnel can be posted offshore to participate in the build in order to develop the in-country skills and knowledge for repair and maintenance.<sup>36</sup>

10.34 Even so, the committee's evidence was unanimous in the view that building warships in-country would deliver greater TLS savings than an offshore build. Defence also agreed with this view but added the qualification that the savings from an in-country build depends on the complexity of the ship. It used the example of the less complex LHDs, stating 'there could be relatively few savings in whole-of-life cost from choosing to build locally'.<sup>37</sup>

10.35 To this stage, the committee has considered the costs of building and repairing a naval ship in Australia vice overseas within a narrow economic framework. The

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35 See for example, Australian Industry Defence Network Inc, *Submission 2*, p. 2.

36 See also ASC Pty Ltd, *Submission 17*, p. 19.

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

following chapter takes a broader approach and examines the wider benefits that accrue to building large naval ships in Australia.