

The Auditor-General  
Audit Report No.8 2000–2001  
Performance Audit

# **Amphibious Transport Ship Project**

**Department of Defence**

Australian National Audit Office

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the Department of Defence.*

Canberra ACT  
7 September 2000

Dear Madam President  
Dear Mr Speaker

The Australian National Audit Office has undertaken a performance audit in the Department of Defence in accordance with the authority contained in the *Auditor-General Act 1997*. I present this report of this audit, and the accompanying brochure, to the Parliament. The report is titled *Amphibious Transport Ship Project*.

Following its tabling in Parliament, the report will be placed on the Australian National Audit Office's Homepage—  
<http://www.anao.gov.au>.

Yours sincerely



P. J. Barrett  
Auditor-General

The Honourable the President of the Senate  
The Honourable the Speaker of the House of Representatives  
Parliament House  
Canberra ACT

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# Abbreviations

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ADF	Australian Defence Force
ADI	Australian Defence Industries Ltd
ANAO	Australian National Audit Office
CDF	Chief of the Defence Force
CN	Chief of Navy
CSSR	Cost-Schedule Status Reporting
DAO	Defence Acquisition Organisation
DARB	Defence Acquisition Review Board
Forgacs	Forgacs Engineering Pty Ltd
GFE	Government Furnished Equipment
HMAS	Her Majesty's Australian Ship
JDOR	Joint Detailed Operational Requirement
LCC	Life-Cycle Costing
LPADT	LPA Delivery Team
LPAPD	LPA Project Director
LST	Landing Ship Tank
MAB	Management Audit Branch
PDR	Project Director's Representative
RAN	Royal Australian Navy
SCA(N)	Support Command Australia (Navy)
THSS	Training and Helicopter Support Ship
USN	United States Navy
VFM	Value-for-Money



# **Summary and Recommendations**



# Summary

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## Background

1. In 1993, Defence proposed to the then Government that Navy acquire a new ship for the dual roles of supporting amphibious operations and providing at-sea training to Navy personnel. The Government decided that the proposal would be too costly but gave Defence permission to examine less costly options.

2. Defence identified the Newport Class—Landing Ship Tank (LST), then in service with the US Navy, as appropriate for Australia's amphibious support needs. In 1994 a Defence Inspection Team examined four such ships about to be de-commissioned by the US Navy and recommended two for purchase. Both ships were purchased for \$61 million in August 1994 and brought to Australia. They are now commissioned as HMA Ships *Manoora* and *Kanimbla*.

3. In May 1996, a \$55 million contract was signed with Forgacs Engineering Pty Ltd (a heavy engineering firm with experience in ship building and repair) for incorporation of a number of capability packages on *Manoora* and for maintenance work on *Kanimbla*. After contract signature, considerable additional repair and refit and emergent work was placed with Forgacs. Increases in the capability incorporated into the ships have also been approved. As a result of this additional work, the contract price at the time of the audit had increased to \$203.8 million and the contract duration from 14 to 44 months (at the time of the audit, *Kanimbla* was planned to be delivered in September 2000). The modified ships are known by the international ship designation LPA.<sup>1</sup>

4. Modification work on *Manoora* was completed in November 1999. At the time of audit, the ship was undergoing tests and trials of its new and overhauled capabilities. *Kanimbla* is still being modified. Total approved project funding at the time of the audit was \$395.1 million. The main items of project cost are the acquisition cost (\$61 million), a maintenance contract with Australian Defence Industries (\$31.5 million), the modification/ refit contract with Forgacs (\$203.8 million) and funding for aviation and Army aspects of the Project (\$35.2 million).

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<sup>1</sup> The LPA designation stands for a class of ships known as Amphibious Transports.

5. A further phase of the project, expected to cost between \$50 million and \$100 million, which would add further capabilities to the ships, is not yet approved. A decision to proceed with this phase is not expected to be made until 2004–05, after Navy has had experience in operating the ships. If approved, this phase would increase the total project cost to more than \$445 million.

6. The objective of the audit was to assess the efficiency and effectiveness of Defence's management of the acquisition and modification of the ships. The audit scope included the acquisition and modification phases of the project, but focused mainly on the modification contract. The audit confirmed the findings of earlier Defence internal audit reviews of the project.

## Overall conclusion

7. Once completed, the two ships are expected to significantly enhance the amphibious lift capabilities of the Australian Defence Force (ADF). *Manoora* was sent recently to the Solomon Islands to assist in a Services Protected Evacuation of Australian Nationals, as required. *Manoora* has also been used transport soldiers and equipment between Australia and East Timor.

8. Problems with this project can be traced back to the capability development and acquisition stages. The lack of clear guidance on the capability being sought and lack of detailed analysis of the capability options increased the risks to the project. The decision to purchase the ships as an 'opportunity buy' without a rigorous examination of their condition, and before available funds lapsed, has caused difficulties that are still being overcome.

9. Inadequacies in the pre-acquisition survey led to an overly optimistic assessment of the ships' condition. The result has been that the amount of repair and refit work required to bring the ships up to Royal Australian Navy (RAN) standards was significantly underestimated. As only minimal provision had been made for this work, and because its full extent was not appreciated by Navy until just before contract signature, large amounts of additional work have been sequentially placed with Forgacs throughout the contract.

10. There have also been increases approved in the cost and number of capabilities added to the ships. This work, together with the additional repair and refit work, has resulted in a significant increase in the amount of unplanned emergent work that has been required to be undertaken on the ships.

11. The placement of considerable additional work after contract signature has limited the benefits to Defence from using a 'firm price' contract. Delays caused by the additional work have resulted in price increases and contract extension costs. The additional work has also adversely impacted on Forgacs' system for monitoring cost and schedule, and consequently the quality of reports produced from it. These reports are an important source of information for the Project Office in managing the contract.

12. The ANAO considers that Navy took a short-term perspective in deciding to use repair and refit funds for the development of a new capability. The use of these funds, which are not intended for such purposes, has adversely affected maintenance levels of the rest of the fleet and consequently its future maintenance costs and reliability levels. Adequate capital funding to bring both ships into operational service should have been fully identified and budgeted prior to their acquisition.

13. The project would have benefited from systematic high-level risk assessment during key stages of the project. It would have helped to avoid, or at least moderate, the significant risks that arose later in the project. Some risks had been identified but could have been better assessed, treated and monitored. Although initiatives to improve contract management are under way, there are indications that *Kanimbla* will not be handed back to Navy in September 2000, as planned.

14. Some of these concerns are highlighted with the benefit of hindsight. Nevertheless, it is clear that fuller consideration of the approaches and better project/contract guidance would have resulted in lower costs and fewer delays on this project.

15. The ANAO considers that, as a result of the considerable cost and schedule overruns on the modification/refit of the ships, their high ongoing maintenance and crewing costs and their limited life-span, any value-for-money advantage provided by the ships over the acquisition of a new ship with similar capabilities has been dissipated, or at least significantly eroded. However, without a detailed analysis, it is impossible to be definitive on this issue.

# Key findings

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## Capability development and value for money (Chapter 3)

16. The capability development process has effectively occurred in reverse on this project, with detailed capability guidance being developed only after modification work on the ships had begun. This has contributed to project cost increases and schedule delays. A life-cycle costing analysis comparing the various capability options and supporting the proposed acquisition of the ships was not undertaken. The lack of a whole-of-capability approach has resulted in the need for additional funding to allow the ships to meet some operational requirements.

17. After modification, the ships will provide the ADF with a number of useful capabilities. However, there is evidence that *Manoora's* capabilities do not fully meet the specified operational requirements. The ships' operating costs are expected to be relatively higher than those of other classes of ship operated by the RAN.

## Cost and schedule issues (Chapter 4)

18. Since May 1996, total project cost has increased from \$125 million to \$395.1 million. This includes the contract cost, which has increased from \$55 million to \$203.8 million. The contract was originally envisaged to take 14 months to complete but may now take 44 months. The primary reason for the cost increase and delay has been the large amount of unplanned additional repair and refit work, capability work and emergent work placed after contract signature. Other reasons include: an underestimation in the complexity of the design phase; Defence delays in delivering Government Furnished Equipment (GFE); and no provision for certain work in the original funding proposal (for example, provision for set-to-work and tests and trials). The placement of a substantial amount of additional work has adversely impacted on the contractor's Cost and Schedule Status Reporting (CSSR) system, reports from which are used by the Project office to monitor contract progress and cost.

19. Most of the additional funding has been sourced from funds that were set aside for repair and refit of other RAN ships. This is expected to have a detrimental, and as yet unquantified, effect on the maintenance levels of the remainder of the fleet and therefore its future reliability. A number of initiatives aimed at improving the management of project cost

and schedule are being undertaken by Defence. However, there are indications that the revised delivery date for *Kanimbla* may not be met and additional funding may be required.

## Contract issues (Chapter 5)

20. The ANAO agrees with a Defence internal audit finding that *‘a better contract would have carefully shared defined risks and contained incentives for early delivery’*. Evidence indicates that it would have been preferable had Defence given more consideration to the form of contract used, as it was known, even before contract signature, that there would be ‘extensive growth work’. The large amount of additional work approved for the ships has caused the Project Office and Forgacs considerable difficulties in processing the required contract changes. As a result, neither party has met all contractual requirements.

21. A ‘firm price’ contract ostensibly places the risk of schedule delays and cost increases with the contractor, but the placement by Defence of considerable additional work after contract signature, and the resultant schedule delays, have meant that some of the advantages of this contract type have been lost. For example, despite being a ‘firm price’ contract, a number of price changes and contract extension costs have been approved. At the time of the audit, Defence’s Project Office was undertaking a number of initiatives to improve its management of the contract.

## Management of project risks (Chapter 6)

22. There was no systematic risk assessment during the concept development or acquisition stages of the project. This resulted in significant risks not being identified or treated, increasing both the significance and likelihood of risks in later stages of the project. There is also evidence that Defence did not adequately consider overseas’ experience with second-hand ship acquisition/modification for military purposes and a caution provided in 1993 by the then Department of Finance regarding such purchases.

23. Production and design risks were assessed just prior to the start of the contract. However, the ANAO found that some of these risks may not have been correctly assessed or adequately treated. There is also evidence that work pressures, especially in the early stages of the modification contract, adversely affected Defence’s ability to monitor identified risks. Defence have identified several significant risks to the completion of the project within current cost and schedule constraints, and advised that these are being monitored.

## **Project review and lessons to be learnt (Chapter 7)**

24. Two internal audit reports on the project, in 1998 and 1999, raised significant issues of concern. It would have been in Defence's interest had closer consideration been given to the reports and their recommendations. It would be generally expected that both reports would be reviewed by Defence's audit committee. Where appropriate action was not being taken in relation to the issues of concern, the Chief Executive could expect to be informed.

25. Lessons to be learned from the Project could be formalised and disseminated for guidance on other major capital acquisition projects.

## **Recommendations**

26. The audit report makes five recommendations aimed at improving the management of this and subsequent acquisition projects. The Department agreed to the recommendations, one with qualification.

# Recommendations

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*Set out below are the ANAO's recommendations with report paragraph references and an indication of Defence's response. This section also sets out lessons to be learned from the project, as identified by the ANAO.*

**Recommendation No.1**  
**Para. 3.30** The ANAO *recommends* that Defence undertake a life-cycle costing analysis of the LPAs so that all costs associated with their operation are known and are budgeted for at an early stage.

*Defence response:* Agreed.

**Recommendation No.2**  
**Para. 4.22** The ANAO *recommends* that, as part of general project monitoring, Defence should develop guidance to assist in deciding at key review points whether a project experiencing significant real increases in total cost should proceed, be modified or be cancelled.

*Defence response:* Agreed.

**Recommendation No.3**  
**Para. 4.35** The ANAO *recommends* that, to avoid the risk of project schedule delay arising from the provision of Government Furnished Equipment (GFE), Defence contracts provide for delivery of GFE only where there are clear advantages for the Commonwealth in doing so and Defence is confident of delivering on time.

*Defence response:* Agreed.

**Recommendation No.4**  
**Para. 6.9** The ANAO *recommends* that, prior to commencement of Phase 3 of the project, Defence assess the design risks associated with this Phase and consider the costs and benefits of letting separate contracts for design and production.

*Defence response:* Agreed, with qualification.

**Recommendation No.5**  
**Para. 7.12** The ANAO *recommends* that the lessons to be learned identified by the Management Audit Branch, the Minister and the ANAO from this project be formalised into guidance and disseminated widely in Defence to assist future acquisition projects.

*Defence response:* Agreed.

## Lessons to be learned

The ANAO identified the following lessons to be learned by Defence from this project:

1. Major Defence capital acquisitions, especially opportunity buys, should only be made after military capability needs have been clearly defined, costed and budgeted. (paragraph 3.10)
2. To avoid the need for additional funding during projects, a 'whole-of-capability' approach should be taken during the capability development process, particularly for capabilities of a joint Service nature (such as the LPA project). (paragraph 3.15)
3. Life-cycle costing analysis is important in the early stages of the capability development process by assisting in decisions on the most cost-effective capability option. It is also important in the later stages, as it allows known costs to be refined and new costs to be identified and adequately budgeted. (paragraph 3.32)
4. To provide adequate focus on management of major projects, new military capabilities should be funded from Defence's major capital equipment funds rather than from its repair and refit funds. (paragraph 4.5)
5. The risks inherent in the purchase of a second-hand ship call for qualified and experienced personnel to make a detailed examination of its condition. The examination requires sufficient time, full access to the ship and a dry dock examination of its hull. (paragraph 4.14)
6. Prior to the placement of any additional work after contract signature, the work should be closely examined for its overall cost effectiveness and its likely impact on budget and schedule. (paragraph 4.48)
7. Given the high design and production risks associated with ship modifications that include repair and refit, there needs to be adequate provision for contingencies (for both general and emergent work). (paragraph 6.15)
8. A high-level risk assessment needs to be undertaken by experienced personnel at key stages of the capability development process and any significant risks identified should be appropriately treated and closely monitored. (paragraph 6.17)

# **Audit Findings and Conclusions**



HMAS Manoora undertaking exercises in February 2000

# 1. Introduction

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## Background

**1.1** In 1993, after a proposal to acquire a new training, helicopter and support ship (THSS) for \$494 million was not supported by the Government in the context of the 1993–94 budget, Defence<sup>2</sup> examined three classes of US Navy (USN) ships to assess their suitability for the dual roles of transport, deployment and support of an amphibious force and the at-sea training of Royal Australian Navy (RAN) personnel. It was decided that the USN's Newport Class 'Landing Ship Tank' (LST) was the most suitable for Australian needs. Known as the amphibious transport ship or the LPA<sup>3</sup> Project, it was planned to acquire two LSTs and modify them to meet the dual roles.

**1.2** Under Phase 1 of the project, Defence purchased the ships for \$61 million and commissioned them as HMA Ships *Manoora* and *Kanimbla*. Under Phase 2 of the project, the ships would undergo a 14 month modification process to allow them to meet their planned dual role. A contract was let with the Newcastle (NSW) firm Forgacs Engineering Pty Ltd on 6 May 1996 for \$55 million. The contract has been managed by the Defence Acquisition Organisation (DAO) through a Project Office located in Canberra.

**1.3** The project has experienced significant delay and cost overruns. *Manoora* was delivered to the Navy in September 1999 but *Kanimbla* is still undergoing modification. Phase 3 of the project, yet to be approved, would provide additional capability for the ships. The particular additions will be decided after Navy has had experience in operating the ships.

**1.4** Once completed, the ships are expected to significantly enhance the Australian Defence Force (ADF) amphibious<sup>4</sup> support capabilities. The primary capability provided by the ships is the ability to embark, lodge and support an Army battalion group using watercraft and helicopters. The 'Fact Sheet' at Appendix 1 provides further detailed information about the ships.

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<sup>2</sup> 'Defence' comprises the Department of Defence and the Australian Defence Force (Navy, Army and Air Force).

<sup>3</sup> Landing Platform Amphibious (a NATO designation).

<sup>4</sup> Unlike the Heavy Landing Ship HMAS *Tobruk*, the LPAs do not possess a direct beaching capability. Their role is to stand off-shore and disembark personnel and equipment using smaller craft.

## Reviews of the project

**1.5** The Management Audit Branch (MAB) in Defence's Inspector-General Division completed two audit reports on the Project. The first (April 1998) focused on the acquisition of the ships.<sup>5</sup> The second (June 1999) focused on the modification of the ships.<sup>6</sup> The reports made a number of recommendations and identified a range of lessons to be learned from the project. MAB reports are internal Defence reports.

**1.6** In August 1999, the Minister for Defence requested that the Chief of Navy (CN) provide him with a full report on the project. On 3 February 2000, the Minister released publicly the report prepared for him by the Chief of Navy as well as a report from the Inspector General.<sup>7</sup> The Inspector General's report summarised the two MAB reports. In his media release (Appendix 1) the Minister was critical of Defence's management of the project and identified a number of important lessons to be learned from the project. These lessons included the need for:

- properly conducted pre-procurement inspections, particularly of second-hand materiel;
- implementation of thorough risk analysis and appropriate risk abatement measures;
- full life-cycle costing of equipment purchases;
- clearly defined operational requirements for the equipment before it is purchased;
- dedicated, competent project teams with full access and authority over expenditure of the project's funds; and
- more active involvement by senior oversight committees.

**1.7** The Minister stated that he had instructed the Secretary of the Department and the Under Secretary Defence Acquisition to recommend to him improvements in the management of the Department so that the experience of the LPA purchase was not repeated in current and future acquisition projects. He also stated that he had asked the Under Secretary to provide him with an urgent status report on the 15 major acquisition projects currently being undertaken by Defence. Defence advised the ANAO in August 2000 that this report had recently been provided to the Minister.

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<sup>5</sup> Management Audit Branch, Final Audit Report *Project JP 2027 Training and Helicopter Support Ships (THSS) Management of the Acquisition Activity* (April 1998, Report No.96132/2 CI).

<sup>6</sup> Management Audit Branch - Final Audit Report - *Project JP 2027 Amphibious Transport Ships Second Report—Management of the Conversion Activity* (Report No.CI 99007, June 1999).

<sup>7</sup> Inspector-General's report to Minister for Defence on Project JP 2027—Amphibious Transport Ships (LPAs), Department of Defence (16 December 1999).

## The audit

**1.8** The ANAO began a preliminary study of the project in February 2000. It was subsequently decided to conduct a performance audit. The scope of the audit, however, was limited because the majority of matters found by the preliminary study had been identified by earlier internal Defence reviews; risks to completion of the project were known to Defence; the Project Office was taking steps to improve the management of the contract; and it did not seem likely that Defence would be undertaking a similar acquisition/modification in the short to medium term.<sup>8</sup>

**1.9** The primary object of the audit was to assess the efficiency and effectiveness of Defence's management of the acquisition and modification of the ships. Subsidiary objectives were to:

- confirm the information contained in the two reports released by the Minister and identify any additional issues;
- summarise the project from its initial development to its current state;
- identify areas of under-performance and lessons to be learned;
- formulate practical recommendations to assist in the management of this and projects of similar nature; and
- consider the value-for-money of the project.

**1.10** The scope of the audit included the project's acquisition and modification phases (Phases 1 and 2 respectively), with a focus on Defence's management of the modification/refit contract signed with Forgacs in May 1996. It was not, however, an audit of the contractor's operations.

**1.11** The following audit criteria were used in conducting this audit:

- whether Defence had undertaken life-cycle costing of feasible capability options demonstrating that the purchase and modification of the ships represented best value-for-money;
- whether Defence had adequately defined its capability requirements prior to purchasing the ships;
- whether Defence had developed a risk management plan and undertaken regular risk assessment and monitoring throughout the project;

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<sup>8</sup> The Government recently decided not to proceed with a Navy proposal to purchase a number of the USN Kidd Class Destroyers.

- whether there was adequate oversight of the acquisition and modification of the ships by senior Defence management;
- whether Defence had taken appropriate action on recommendations made by audits/reviews conducted during the project; and
- whether the capability delivered by the project matches that identified and being sought.

**1.12** As part of the audit, the ANAO examined Project Office files relating to the acquisition and modification/refit stages of the project. The audit team also had a number of discussions with the key Defence personnel involved in the project, including the Project Director and the Business Manager, representatives from Support Command Australia—Navy (SCA(N)), the Head of the LPA Delivery Team (LPADT) and Army representatives.

**1.13** The audit team visited Forgacs Dockyard to view both ships. At the time, *Manoora* was undergoing maintenance work and *Kanimbla* was in the early stages of modification and refit. The visit provided the audit team with an appreciation of the state in which the ships had been when acquired from the US and the substantial amount of work that had been undertaken on *Manoora* to bring it up to RAN standards. During this visit the team spoke to the Joint Managing Director of Forgacs Engineering Pty Ltd and both ships' captains.<sup>9</sup>

**1.14** Copies of the proposed report were provided to Defence and Forgacs in July 2000. The final report was prepared after consideration of comments they provided in August. In addition to commenting on particular aspects of the report, Forgacs made the following general comments:

*We have taken time to review the report in detail and while it is not our purpose to pass comment on the lessons learned and the recommendations, we nevertheless concur in principle with the report's overall findings....*

*The company has found that the report has in large part addressed the primary issues associated with the LPA Project and has identified lessons learned and made recommendations for future reference.*

**1.15** The audit was conducted in conformance with ANAO auditing standards and cost \$149 000.

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<sup>9</sup> The meeting with Forgacs' Joint Managing Director was a courtesy extended to the audit team as part of the visit to the dockyard. It was not a formal audit interview.

## Report structure

**1.16** The remainder of the report sets out the ANAO's audit findings and conclusions and is divided into six chapters, as follows:

- chapter 2—an overview of the project from conception to the present time;
- chapter 3—the capability development process and value-for-money issues;
- chapter 4—project cost and schedule issues;
- chapter 5—contract issues and contract management;
- chapter 6—management of project risks at key stages of the project; and
- chapter 7—internal audit reports on the project and lessons to be learnt.

## 2. Overview of the Project

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*This chapter provides an overview of the amphibious transport ship project from its conception through to its status at the time of the audit.*

### Project Phase 1—acquisition

#### *The Training, Hospital and Support Ship proposal*

**2.1** During the early 1990s, a Defence project was initiated to investigate the acquisition of a new ship with amphibious lift capabilities and the capacity to provide at-sea training of Navy personnel lift of the Australian Army. It was proposed to replace the training ship HMAS *Jervis Bay*<sup>10</sup> with a new dual-role training and helicopter support ship (THSS). The THSS was also to offset, partially, the loss of some of the capabilities provided by the amphibious heavy-lift ship HMAS *Tobruk* when it reached the end of its planned life in 1994.

**2.2** The THSS project was abandoned in May 1993, when the then Government decided that the proposal to construct a new ship, with an estimated cost of \$494 million, could not be afforded in the context of the Government's 1993–94 budget. However, in recognition of Australia's strategic requirement for the capacity to transport, deploy and support an amphibious force, the Government gave approval for Navy to undertake a study of less costly options for acquiring the required capability. There were several options: acquisition of a basic training ship; conversion of a merchant vessel; refit of an existing US Navy amphibious ship; or procurement of an austere *ab initio* design. The then Minister indicated that a total cost of \$250 million would not be unreasonable.

**2.3** In mid-1993, Defence engaged Australian Defence Industries Ltd (ADI) to examine three classes of US Navy ships to assess their suitability for the THSS role. The Newport Class Landing Ship Tank (LST) was considered to be the most appropriate class for Australia's needs, primarily because of its cost-effective capability and its relatively small crew size. The ships were still in service at this time (and therefore undergoing regular maintenance) but it was known that the US Navy was planning to decommission this class of ship. Under such conditions a purchase is known as an 'opportunity buy'.

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<sup>10</sup> *Jervis Bay* was decommissioned in 1994.

### *Purchase of two US Navy tank landing ships*

2.4 In November 1993, the Force Structure Policy and Programming Committee (FSPPC) endorsed the acquisition of two LSTs for a total of \$60 million. Additional costing information was received from the US Navy increasing the estimated cost of the proposal to \$70 million. In December 1993 the Government provisionally endorsed a Defence proposal to purchase two LSTs for \$70 million. At this time the Government was also advised of Defence's intention to modify both ships as THSSs for an estimated total cost of \$30 million. Final approval to acquire the LSTs was subject to a detailed examination of the ships' condition by Defence personnel.



HMA Ships *Manoora* and *Kanimbla* prior to acquisition by the RAN

2.5 In May 1994, a Defence Inspection Team comprising representatives from the THSS Project Office, Support Command Australia—Navy (SCA(N)) and Maritime Headquarters conducted surveys of four LSTs identified during the ADI study as being in the best condition, with the aim of identifying the two best-maintained, structurally-sound ships. The Inspection Team recommended the purchase of two ships—USS *Saginaw* (later commissioned as HMAS *Kanimbla*) and USS *Fairfax County* (later commissioned as HMAS *Manoora*).<sup>11</sup> The Team considered that the ships, launched in 1970, were '*structurally sound and generally in a satisfactory condition*' and that the RAN could '*reasonably expect a further 20 years life from them*'.

<sup>11</sup> USS *Saginaw* was commissioned HMAS *Kanimbla* on 29 August 1994 (in the US). USS *Fairfax County* was commissioned HMAS *Manoora* on 25 November 1994 (in Australia).

2.6 In August 1994, following US legislation authorising sale of the ships, Australia took delivery of the two ships 'as is' for \$61 million. This amount included the cost of the ships and the cost of transferring them to Australia (fuel, personnel, equipment, supply support and logistics costs). Appendix 2 provides a breakdown of the acquisition cost.

2.7 Detailed hull inspections in Australia revealed extensive corrosion and the need for extra repair work. During 1995 *Kanimbla* was used as a Naval training ship and *Manoora* remained alongside at ADI's facilities in Sydney.

#### *ADI repair and refit work*

2.8 At Navy's request, ADI undertook contracted maintenance work on the ships (primarily on *Manoora*) late in 1995. ADI's work focused on hull repairs and other tasks considered essential for the ships to meet minimum RAN operating and safety standards. The total cost of ADI's work was \$31.5 million, and was funded by SCA(N). During the ADI work it became apparent that considerable additional work would be required to bring the ships up to normal RAN operational standards. Navy considered that the corrosion and other identified defects were a direct consequence of the low level of maintenance undertaken by the US Navy. The ANAO understands that the US Navy has a three-tiered maintenance system for its ships and that, as the LSTs were on the third tier, they received minimal maintenance.

## **Project Phase 2—modification of the ships**

2.9 In May 1994 Defence's Force Structure Policy and Planning Committee (FSPPC) considered that it would be possible for the ships to achieve a basic level of capability within the \$30 million cost estimate previously provided to Government, but that this would exclude some necessary modifications that were not foreseen at the time of the original advice to Government. The FSPPC considered that any sensible baseline options should include a medical facility, improvements to supportability of the ships and crew 'habitability.' By the time the Government approved Phase 2 of the project in June 1994, the total cost estimate for the Phase 2 modifications had increased to \$55 million. This included provision for emergent work and repair and refit work (both ships); pollution control equipment (both ships), accommodation upgrade (both ships), fresh water facilities upgrade (both ships) and a medical facility for one ship.<sup>12</sup>

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<sup>12</sup> Minute to Minister seeking approval for modification of ships at a higher cost than previously advised 3 June 1994 p. 4, (S&I 84/1994).

**2.10** Navy further refined its capability requirements for amphibious lift capacity and identified scope for additional capability modifications to the ships. When it became apparent that not all modifications could be accommodated within the funding cap (\$55 million), Navy decided to undertake as many of the higher priority modifications as possible within the cap. Other proposed modifications were to be postponed until a planned Phase 3 of the project.

### *Selection of Phase 2 Prime Contractor*

**2.11** Tenders were called from Australian shipbuilding firms for Phase 2 modification work in December 1994. There were three responses to the request for tender (RFT): ADI, Forgacs Engineering Pty Ltd (Forgacs) and a consortium of two Queensland firms. It was decided that only ADI and Forgacs had submitted suitable tenders. These tenders were then evaluated according to price, compliance with RFT specifications, and proposed modification plans. In November 1995, Defence announced Forgacs as the preferred tenderer. After contract negotiations, a 'firm price' contract was signed on 6 May 1996 for \$55 million.<sup>13</sup> The contract cost comprised \$47 million for capability packages and an \$8 million repair and refit package for *Kanimbla*.<sup>14</sup> Both ships were delivered from ADI to Forgacs in mid-1996.

**2.12** Additional funding of \$8 million of unspent Phase 1 funds was later transferred to Phase 2, increasing total approved funding of Phase 2 to \$63 million.

### *Additional repair and refit work required*

**2.13** During the ADI work, it became apparent that more repair and refit work would be required to bring the ships up to RAN reliability standards, as much of the ships' equipment was in poor condition. In addition, experience in operating *Kanimbla* for eight months as a training ship in 1995 had revealed to Navy a number of operational, occupational health and safety and general ship configuration/layout deficiencies. It was considered that, if these were not rectified, the ships would not be capable of the roles that Defence expected of them.

**2.14** A Navy review<sup>15</sup> in May 1996 identified the need for a number of essential work packages to rectify the known deficiencies with the ships. This work concerned crew habitability modifications, some asbestos removal, configuration changes, overhaul of machinery and equipment,

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<sup>13</sup> Defence had previously engaged Forgacs to undertake refits of HMAS *Westralia* in 1993 and 1996.

<sup>14</sup> The value of Australian Industry Involvement (All) was assessed as 85.5 per cent of the contract sum but, due to a number of contract amendments, it had increased to approximately 90 per cent at the time of the audit.

<sup>15</sup> Review of THSS Modifications and Funding, Captain Warrington (9 May 1996).

and a communication upgrade.<sup>16</sup> The then Minister was advised that further funding would be required for this work. This would be in addition to the endorsed modification cost (\$55 million) and the work already completed by ADI (\$31.5 million). The additional work was estimated to cost between \$41.5 million and \$74.2 million. SCA(N) provided funding of \$55 million for this purpose from its repair and refit vote. A number of repair and refit work packages were added to the contract late in 1996.

**2.15** The THSS designation was changed in 1996 to Landing Platform Amphibious (LPA) to comply with internationally recognised ship designations.

### *Army funding*

**2.16** In March 1997 Army sought approval from the then Minister for \$15.2 million for the procurement/enhancement of a range of equipment and ancillary and training items to allow Army to operate as part of any joint amphibious force launched from the ships. Approval was granted in April 1997. The funding was provided for 10 main areas, including watercraft upgrades, training, tests and trials and procurement of purpose-built forklifts. Appendix 3 provides a breakdown of the specific items and their associated cost.

**2.17** During 1997, an amount of \$2.1 million in capital funding was provided for Project Sea 1160, a project to replace the ships' systems and equipment that contravened international marine pollution protocols, including halon gas firefighting suppressants, chloro-fluoro carbon refrigerants, and sewage treatment.

### *Growth in emergent work*

**2.18** Equipment on *Manoora* was stripped down or removed during the initial stages of modification, and this disclosed the need for considerable emergent work<sup>17</sup> relating to engine cracking and asbestos. It indicated that the repair and refit funding required would be at the top end of the earlier estimated cost range (that is, close to \$74.2 million). These funds were to provide for repair of the hull, the main machinery system, installation of configuration changes and high-priority habitability improvements. Additional repair and refit funding was provided, increasing total Phase 2 Support Command Australia (Navy) (SCA(N)) funding to \$74.2 million.

**2.19** It was later assessed that these funds would be insufficient to meet the minimum level of safety required by Navy for the ships to go to sea. Navy reviewed the repair work necessary to enable the ships to

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<sup>16</sup> The communications upgrade for \$6.9 million was funded from the Navy Minors program and included in the amount of \$74.2 million sought.

<sup>17</sup> 'Emergent work' can arise as a result of a survey or in the course of other work.

reach this minimum level (for example, repair and refit of auxiliary systems, repair of superstructure cracking and essential re-lagging) and advised the Minister that additional funding would be required. In December 1997, a further \$14.5 million was approved by the Defence Management Committee (now known as the Defence Executive).

**2.20** In December 1997, Defence Acquisition Organisation (DAO) gained Government approval for further capital funding of \$36 million for a number of capability enhancements aimed at bringing the two ships to a similar level of capability. This was considered necessary because of the increasing strategic priority attached to amphibious capabilities within the Australian Defence Force (ADF) at that time.

### *Phase 2A of LPA project*

**2.21** As a result of a Defence report in August 1997<sup>18</sup> on the conduct of helicopter operations from the ships, the Government approved Phase 2A of the LPA Project in 1998 at a total project cost of \$20 million. This was to provide enhancements to enable safe and effective helicopter operations from the ships. The report proposed, inter alia, that Navy's Sea King or Army's Black Hawk helicopters should be able to operate from the ships. Appendix 4 provides details of the items funded and their cost. At the time of the audit only \$280 000 of these funds had been spent (this was on test equipment for first of class flight trials).

### *Further emergent work*

**2.22** Throughout 1998 and early in 1999, as the modification/refit proceeded, the need for further significant amounts of emergent work arose, particularly with hull and electrical repairs. It was considered that failure to rectify these defects would affect the reliability of the ships when they returned to service and result in escalation of maintenance costs in later years. In January 1999 the Defence Management Committee endorsed further expenditure of \$22 million of SCA(N) repair and refit funding to complete the refit and repair of the ships.

### *Delivery team established*

**2.23** In July 1999, in response to continuing problems with the project, the Chief of Navy (CN) established the LPA Delivery Team (LPADT). The team was to coordinate the number of areas involved in the project and to accelerate the ships' progress to an operational state while ensuring that safety issues were fully addressed. CN required the LPADT to ensure that *Manoora's* level of capability would be equivalent to *Tobruk's* by end of March 2000 and that *Kanimbla's* would be at that level six months later. These objectives were not met.

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<sup>18</sup> Report into helicopter operations from Landing Platform Amphibious vessels by AVM D.A. Tidd AM MBE RAAFAR (11 August 1997).

## Project status at the time of audit

**2.24** *Manoora* was delivered to Navy on 26 November 1999. The ship completed sea trials on 19 January 2000 and returned to Forgacs Dockyard early in February 2000 for post-delivery maintenance. At the time of audit *Manoora* was undergoing further tests and trials.

**2.25** As a result of major increases in the scope of the work and a consequential delay in the completion of the contract, Forgacs made a number of contract extension claims (for example, increased project management costs and other overheads). These were settled on 3 May 2000 for \$17 million, with an additional \$2 million to be paid to Forgacs on delivery of *Kanimbla* to Navy by 28 September 2000. The settlement figure is to be wholly funded by SCA(N). To complete work on *Kanimbla* and *Manoora*, SCA(N) also received approval from Support Command Australia<sup>19</sup> for additional funding of \$35 million, most of which is to be spent on *Kanimbla*.<sup>20</sup> The funding includes provision for the estimated cost of work known to be outstanding at the time of the funding proposal; work which had been funded for *Manoora* but not for *Kanimbla*; and the estimated or known costs of outstanding work on *Kanimbla*. The ANAO understands to mid-July 2000 approximately \$21 million of the total allocation had been contracted with Forgacs. Appendix 5 provides a breakdown of the additional \$35 million.

**2.26** At the time of audit, *Kanimbla* was in the early stages of modification/ repair and refit work. The ship is planned to be delivered by Forgacs to Navy on 28 September 2000. Once completed, the ships are to be 'home-ported' at Fleet Base East in Sydney.

**2.27** Total approved funding for the project at April 2000 was \$395.1 million (see Table 1 for details). The ANAO considers that a number of other costs should be attributed to the project. For example, the ANAO estimates that staffing costs associated with the Project Office amount to approximately \$9.6 million.<sup>21</sup> The ANAO also estimates that accommodation and travel costs for Navy personnel associated with the project to be in excess of \$5.8 million.<sup>22</sup> These costs would increase total project cost to approximately \$410 million.<sup>23</sup>

<sup>19</sup> These monies have been sourced from additional funding allocated to Support Command Australia by the Defence Executive for logistic shortfalls in 2000–04.

<sup>20</sup> Funding for *Manoora* includes planned maintenance work.

<sup>21</sup> Assumes an average staffing level of 30 over four years, with an average salary equivalent to an ASO6 (approximately \$80 000 on a full cost recovery basis). Calculation includes PDR Office staff and is based on the Defence Ready Reckoner of Personnel Costs and Related Overheads (February 1998).

<sup>22</sup> Figure sourced from MAB's second report on the project.

<sup>23</sup> The ANAO was advised by the Directorate of Budget and Estimates (Navy) that the written down values of *Manoora* and *Kanimbla* on Defence's asset register as at 31 March 2000 were 119.6 million and \$70.8 million respectively (values determined using the Deprival Valuation Method). As *Kanimbla* is still in the process of being modified/refitted, it is classified in the Defence asset register as an 'asset under construction'.

**Table 1****Total approved funding for LPA Project as at April 2000**

<b>Project Phase</b>	<b>Funding source</b>	<b>Approved Funding (\$m)</b>			<b>Total (\$m)</b>
		<b>DAO</b>	<b>Navy</b>	<b>Army</b>	
<b>Phase 1</b>	Acquisition cost	62.1			93.6
	Repair and refit (R&R)		31.5		
<b>Phase 2</b>	Modification				
	Capital funding	55.0			
	Capital funding (1)	8.0			
	Project Sea 1160	2.1			
	Capital funding	36.0			
	Repair and refit (2)		74.2		
	Repair and refit		14.5		
	Repair and refit		22.0		
	Repair and refit		35.0		
	Extension claims		19.0		
	Other		0.5		
	Army funding (3)			15.2	
<b>Phase 2A</b>	Helicopter enhancements	20.0			
	<b>Phase 2 sub-total</b>	<b>121.1</b>	<b>165.2</b>	<b>15.2</b>	<b>301.5</b>
<b>Total approved funding</b>		<b>183.2</b>	<b>196.7</b>	<b>15.2</b>	<b>395.1</b>

Source: Project Office records.

(1) Residual from Phase 1 transferred to Phase 2.

(2) Includes \$6.9 million for communications upgrade (funded under Navy Minors 1728).

(3) Minor capital submission (Land).

**2.28** By the time Phase 2 of the project is completed, each ship will have had the following capability packages added from the funds already approved (see Figure 1):

- installation of three dual-use compartments. When the ship is being operated as training ship, the compartments will provide a classroom/briefing room, chart-work room and general purpose room. When operated as an amphibious ship the compartments will provide a briefing room and areas for command and control. The classroom will be fitted with enhanced command, control and communications systems;
- installation of three helicopter landing spots, one forward of the ship superstructure and two aft. To provide a larger area for the aft landing spots the stern of each ship has been lengthened;
- the addition of new radars, an increase in aviation fuel capacity and the fitting of bilge keels to enhance helicopter operations;
- installation of a helicopter shelter to provide for the storage and securing of four Army Black Hawk or three Navy Sea King helicopters;

- installation of a medical facility to enable initial wound surgery and hospitalisation for medium and high dependency nursing of the wounded, sick and injured;
- installation of a 70 tonne crane to allow stowage of two Army landing craft on deck and to launch/recover them in specified sea conditions; and
- accommodation for 650 personnel, 200 crew (with provision for mixed gender crewing) and 450 embarked troops.

**2.29** It was originally planned to incorporate a side door from the vehicle deck on each LPA to assist in the disembarking of vehicles and other equipment. However, as it was later found that such a modification would adversely affect the structural integrity of the ships, it was not undertaken. When fully operational, each ship will have a crew of 200 personnel, including a Ship's Army Detachment (SAD) of approximately 20 personnel.

## Proposed Phase 3—additional capability

**2.30** Phase 3 of the project, as yet unapproved, would provide a number of capability enhancements for the ships. A decision on whether Defence will proceed with this phase is to be made by Cabinet in 2004–05, after Navy has had experience in operating the ships.

**2.31** Capabilities proposed for inclusion in Phase 3, should it proceed, include:

- ventilation and air conditioning upgrades;
- new engine monitoring and control system;
- refuelling for helicopters;
- vehicle deck lift;
- bulk liquid transfer; and
- replenish aviation fuel at sea.

**2.32** Additional enhancements being considered include improved facilities for C3I,<sup>24</sup> self-protection measures and lift capacity. Expenditure on Phase 3, if it proceeds, is estimated to be between \$50 million and \$100 million.<sup>25</sup> This would increase total project cost to between \$445 million and \$495 million (excluding additional costs identified by the ANAO in paragraph 2.27).

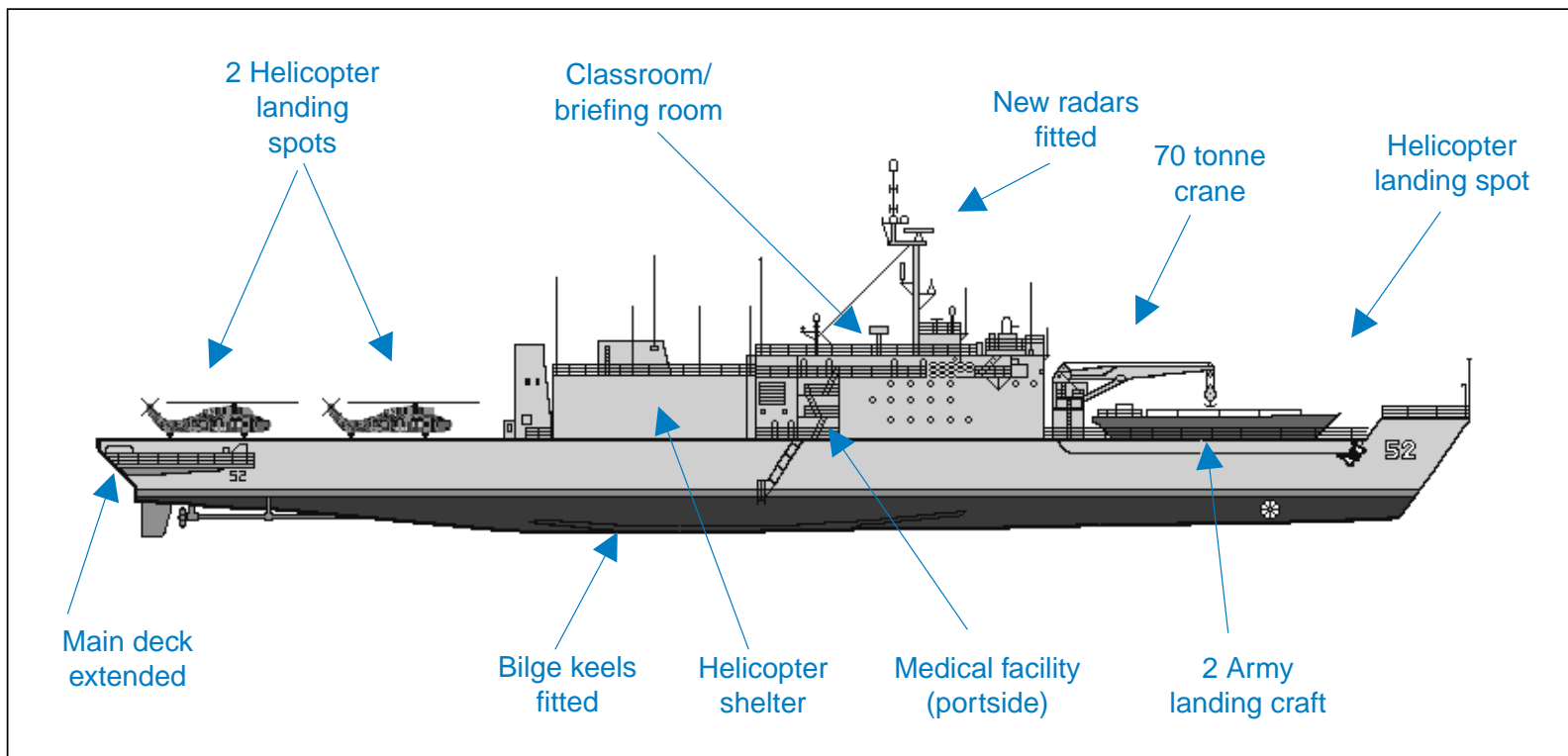
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<sup>24</sup> Command, control, communications and intelligence.

<sup>25</sup> See Defence's *Pink Book (unclassified)—Defence New Major Capital Equipment Proposals 1998-2003* (June 1999) at Defence Acquisition Organisation website <http://www.dao.gov.au>

**Figure 1**

**Capabilities added to each ship during Phase 2 of the Project.**



### 3. Capability Development and Value for Money

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*This chapter comments on the need for clear capability guidance supporting the acquisition of capital equipment, the need for life-cycle costing to aid the decision-making process and a 'whole-of-capability' approach to its development. It also sets out the expected capabilities of the ships and discusses the value for money of the modified ships.*

#### Need for definitive capability guidance

**3.1** Defence's process for developing military capability requirements seeks to define the specific capability requirement sought prior to the acquisition of that capability. It begins with the identification of the desired capability (for example, amphibious lift) and is completed when the capability enters operational service. During this process a top-level capability requirement is developed and a number of capability options are provided to senior officers. The key deliverable of the process is a list of clearly agreed detailed operational requirements (DOR).

**3.2** Acquisition of the two ships was arranged quickly to take advantage of an expected underspend in the Defence budget in 1993–94 and because other countries were understood to be expressing interest to the US Navy in acquiring ships of that class. The rushed nature of the acquisition meant that definitive capability guidance had not been developed prior to their acquisition. At the time of acquisition, the DOR still reflected the capabilities of the 'new-build' (Training and Helicopter Support Ship) proposal that was ruled out in 1993 by the then Government.

**3.3** On 2 May 1996, the then Minister agreed to the placement of a contract with Forgacs. On the minute<sup>26</sup> from the Assistant Chief Materiel—Navy seeking approval to proceed, the Minister noted that:

*Getting information on this project has been like extracting teeth. It seems that we still don't know exactly how these ships are to be used and that there is further work (yet to be costed) on a number of unanticipated programs. For example, I will be interested to hear what proposals come forward to make the ships and the Black Hawks compatible for embarked operations.*

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<sup>26</sup> ACMAT-N 353/96 Consolidated funding—Training and Helicopter Support Ship, 30 April 1996.

3.4 At that time, the LPA Project Director wrote to Defence's Land and Sea capability development areas advising that the DOR required review and updating. He commented that *'the review and update process will ensure the draft DOR is amended to reflect the specification requirements incorporated into the contract'*. A Joint Detailed Operational Requirement (JDOR) was subsequently reviewed and released in February 1997, more than two and a half years after the ships had been purchased.

3.5 In April 1997 the LPA Project Director indicated that *'the total work package for the ships is now considerably different from that which was approved by the FSPPC in May 94.'* In May 1997 the then Chief of Navy commented that *'The real problem with the introduction of the LPAs into service appears to be the absence of a clear specification of precisely what was intended. This has led to judgements about individual work items being made by authorities not qualified to make those judgements.'*

3.6 There is evidence that the current JDOR has not been updated to reflect capability additions that have occurred since the revision of the JDOR in 1997. At the September 1998 meeting of the Naval Capability Management Board the Chief Staff Officer Tests & Evaluation stated that the JDOR was 'out of date' and consequently the LPA Operational Test Director was experiencing difficulty in drawing up a Joint Test Plan against the JDOR.

3.7 It is apparent that capability development for the ships occurred in reverse order to the proper process, and the JDOR is now being reviewed to match the capabilities that have been added to the ships. This has contributed to project cost increases and schedule delays. The present Minister noted in his 3 February 2000 media release that a lesson to be learned from this project is that there is a need for clearly defined operational requirements for equipment before it is purchased.

3.8 The Under Secretary Defence Acquisition gave the following evidence recently to the Joint Committee of Public Accounts and Audit on Defence's management of major projects:

*... one of the consistent problems I have found with projects that are in trouble is that capability was not tightly enough defined at the time we went into the proposal. It is this whole process of changing capability after you get into the proposal that really causes you some trouble. I would offer you the LPAs as a classic example. ...*

*So more than anything I am trying to get the output managers to nail down capability beforehand.<sup>27</sup>*

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<sup>27</sup> Joint Committee of Public Accounts and Audit, Review of Audit Report No.13 1999–2000 *Management of Major Equipment Acquisition Projects—Department of Defence*, Proof Hansard 16 May 2000, p. PA35.

3.9 The ANAO considers that, after the new-build proposal was rejected, the operational requirement should have been reviewed and a more affordable operational requirement developed reflecting ADF capability priorities. A risk with 'opportunity' buys is that the capability development process is driven by considerations such as the availability of unspent funds and other time pressures, rather than well defined capability requirements (an analysis of Defence's management of project risks can be found at Chapter 6 of this report). The ANAO also considers that Defence should avoid 'opportunity' buys unless they are based upon well defined capability requirements, clearly costed and adequately budgeted.

### **Lesson to be learned**

3.10 Major Defence capital acquisitions, especially opportunity buys, should only be made after military capability needs have been clearly defined, costed and budgeted.

### **Need for a 'whole of capability' approach**

3.11 There is no evidence of a 'whole-of-capability' approach in the development of the LPA capability. The ANAO would have expected that all aspects of the project necessary to allow the ships to carry out their operational requirement would have been identified, costed and funded prior to Phase 2 of the project. Instead there were late proposals for additional funding to enable the ships, on completion of Phase 2 of the project, to fulfil their stated roles.

3.12 Army representatives told the ANAO that there was no separate funding provision in the original Phase 2 budget to allow Army to operate effectively with the ships. Consequently, Army had found it necessary to seek funding for this purpose. Funding of \$15.2 million was sought and provided in 1998 for Army equipment purchases and upgrades; training; doctrinal development and a number of other areas (see Appendix 3 for details). When approving these funds the then Minister asked why he had not seen a complete proposal for the ships and sought information on what the *'whole, final costed proposal for two helicopter landing ships'* would be, including *'Army modifications and additions.'* The ANAO found no evidence that the Minister's request was met.

3.13 The original modification proposal included funding for three helicopter landing spots on both ships. However, only in 1997 was it identified that additional funding would be required to allow helicopters to operate safely from the ships. In 1998, funding of \$20 million was approved for this purpose. The funding is to provide for training facilities, aviation support aspects and ballistic matting (see Appendix 4 for details). At the time of the audit only \$280 000 of these funds had been expended.

**3.14** The lack of a ‘whole-of-capability’ approach to the development of the LPA capability has resulted in the need for additional funding during the modification process to allow the ships to achieve the required operational standard post-modification. Given the joint Service (Navy, Army and Air Force) nature of amphibious operations, the total funding requirements necessary to allow the ships to re-enter service fully meeting all operational requirements should have been identified and budgeted prior to the purchase and modification of the ships.

### **Lesson to be learned**

**3.15** To avoid the need for additional funding during projects, a ‘whole-of-capability’ approach should be taken during the capability development process, particularly for capabilities of a joint Service nature (such as the LPA project).

## **Capabilities provided by the LPAs**

**3.16** After the modification and repair and refit of the ships, they are expected to have the ability to:

- transport a tactically embarked battalion group<sup>28</sup> (in conjunction) to a maximum range of 6000 km, remain on station for 14 days and conduct a Services Protected Evacuation;
- conduct an amphibious tactical lodgement by a combination of helicopters and embarked landing craft;
- conduct logistics over the shore (LOTS)<sup>29</sup> for lodging and sustaining force elements;
- embark trainees and provide facilities to support at-sea training;
- embark and disembark force elements at fixed port facilities;
- provide facilities for command, control, communications, electronic warfare and intelligence needs;
- provide a medical facility capable of initial wound surgery and post-operative intensive care (one ship only, originally);
- provide a base from which to conduct helicopter operations;
- provide fuel and potable water for the force operating ashore; and
- provide a disaster relief operating base in Australia and regional waters.

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<sup>28</sup> The battalion group would consist of approximately 900 personnel and associated equipment (including aviation, LCM8 and freight handling personnel).

<sup>29</sup> Logistics over the shore (LOTS) is the loading and unloading of ships without the benefit of fixed port facilities.

### *Capability deficiencies*

3.17 There is evidence that *Manoora's* capabilities do not fully meet those specified in the Joint Detailed Operational Requirement (JDOR). Key deficiencies relate to the strength of the forward deck and stern door (that is, the ability to move heavy vehicles over them); heating and cooling capacity of the ship; the ability to produce sufficient amounts of potable water and transfer it ashore; and handling and stowage of watercraft in certain sea states. There are also concerns about *Manoora's* ability to embark and disembark forces at 'fixed port' facilities. *Manoora* was accepted in December 1999 with the deficiencies and performance shortfalls specified in the formal vessel acceptance document.<sup>30</sup> The ANAO understands that these deficiencies and shortfalls are being investigated by Defence (through the tests and trials process) or will be addressed in the proposed Phase 3 of the project (for example, bulk liquid transfer).

### *Acceptance into Naval Service*

3.18 Navy has made clear its intention to conduct a full Acceptance into Naval Service (AINS) review of each ship. This process aims to confirm that the capability provided by the modified ships (post delivery) meets that detailed in the Joint Detailed Operational Requirement (JDOR). The ANAO considers that it is important that an AINS review be undertaken because of the age of the ships; the extent of capability and repair and refit work undertaken on them; a platform with this mix of capabilities has not previously been operated by the RAN; and the known capability deficiencies identified with *Manoora*. The ANAO notes that the JDOR will need updating before an AINS review is conducted.

## Life-cycle costs

3.19 After rejection of the THSS proposal in April 1993 (see paragraph 2.2), four options were identified for delivery of an amphibious support capability. In May 1993, the Deputy Secretary—Strategy and Intelligence advised the Minister that '*a logical way ahead [for the project] would be to conduct a funded cost/capability study (for about \$2 million) in 1993–94 of a new build versus second-hand conversion from one of the above options*'. The ANAO did not find evidence that such a study was undertaken.

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<sup>30</sup> Report of Material and Equipment Performance State of HMAS MANOORA to the Commonwealth of Australia by FORGACS Engineering Pty Ltd (TI338).

**3.20** In November 1993, shortly before provisional endorsement in December 1993 of the proposal to purchase the two ships, Defence completed a simplistic analysis comparing life-cycle costs (LCC)<sup>31</sup> of the Tank Landing Ships (LST) with those of *Tobruk* and *Jervis Bay* up to 2014. The analysis found that the replacement of *Tobruk* and *Jervis Bay*<sup>32</sup> with the modified LSTs would result in a \$207 million saving. The ANAO, however, has some reservations about the costing, particularly in relation to the methodology used, and the level of analysis and its focus.

**3.21** At the time of the analysis, Defence estimated that two LSTs could be acquired for a total of \$30 million and would require a ships' Integrated Logistic Support (ILS) package of \$30 million and modifications totalling \$30 million. The annual operating cost of each proposed ship was estimated at the time to be \$21 million. The annual operating costs of *Jervis Bay* and *Tobruk* were estimated to be \$27 million and \$24 million respectively.

**3.22** In 1995, Defence was asked at Senate 'estimates' hearings whether there had been a formal study of the LPAs' through-life costs.<sup>33</sup> The Defence response was that, prior to acquiring the ships, a study of their through-life costs to 2014 found that the cost of operating the LSTs would be similar to that of *Tobruk* and *Jervis Bay*.<sup>34</sup> At the time of the study, it was still planned that the LPAs would replace *Tobruk* and *Jervis Bay*.

**3.23** The ANAO notes that, although the Defence response in 1995 was that the pre-acquisition through-life costing indicated that the costs of the LPAs would be similar to those of *Tobruk* and *Jervis Bay*, it was apparent to Defence by 1995 that the data used for that costing were no longer applicable and that the LPAs would have higher operating costs, a major determinant of through-life costs. A 1997 Navy review of LPA cost and schedule pressures stated that *'The two LPAs just logically present as a greater burden than the ships they replace. ...In all of the fundamental cost-driving parameters of size, age and condition, the discrepancy is clear and it is inevitable that these two ships will place greater strain on operating costs once they return to Navy.'*<sup>35</sup>

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<sup>31</sup> Life-cycle costing is a technique for estimating the total cost of ownership of an asset over its lifetime in order to assist in resource allocation decisions. Life-cycle costs can be defined as the sum of all monies expended, attributed directly and indirectly to a defined system from its conception to its disposal, encompassing the acquisition, ownership and disposal phases of the project. These include costs for research and development, production, personnel to operate and maintain the system, ongoing logistic support, facilities and eventual disposal.

<sup>32</sup> It was assumed that *Tobruk* would be replaced in 2010 and *Jervis Bay* in 1999.

<sup>33</sup> Senate Foreign Affairs, Defence and Trade Legislation Committee Hansard 15 February 1995, p. 118.

<sup>34</sup> The study was based upon actual USN and RAN operating cost data.

<sup>35</sup> Examination of LPA Maintenance and Modernisation Cost and Schedule Issues, 4 July 1997 (p. 15).

**3.24** As early as 1989, the Chief of the Defence Force and the Secretary of the Department of Defence directed that through-life costs be better taken into consideration in procurement processes. Defence had a LCC policy in place prior to the capability development stage of the LPAs commencing.<sup>36</sup> The policy required LCC at various decision points throughout the life cycle of an equipment or weapons system.

**3.25** MAB's first report (April 1998) on the LPAs (see paragraph 1.5 above) recommended that the LPA Project Director initiate the development of a LCC analysis model '*for the purpose of assisting in planning future resource requirements*'. In response to this recommendation the CSO (M&G) stated that:

*LCC is at best an inexact science with value only as an aid in comparing the probable outcome of two or more competing outcomes. Since we have already procured the ships I see little value in undertaking a LCC analysis to determine whether the purchase represents value-for-money in the longer term.*

**3.26** In June 1998, however, the LPA Project Director advised that a plan for a life-cycle costing analysis would be developed after delivery of the ships and that the analysis would be undertaken by a service provider.

**3.27** A 1998 ANAO report on LCC in Defence commented that, other than for the tender selection stage:

*LCC was not generally used at other stages of the acquisition life cycle, such as the early concept development stages, and the in-service and disposal stages. Defence policy has been set for LCC for some time. But there appears to be little top-level enforcement or encouragement at present for the use of LCC throughout the acquisition life-cycle.*<sup>37</sup>

**3.28** The ANAO considers that, prior to acquisition of the ships, there should have been a detailed LCC analysis undertaken to assist in comparing the capability options under consideration at the time. Such an analysis would have helped to confirm that the acquisition and modification of the ships provided the best value for the Commonwealth in the long term. The Minister's media release of 3 February 2000 identified the need for full life-cycle costing of equipment purchases as an important lesson to be learned from the project.

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<sup>36</sup> (DI(G) LOG 03-4 Defence Policy on life cycle costing (17 November 1992).

<sup>37</sup> Audit Report No.43 1997-98 *Life Cycle Costing in the Department of Defence*, May 1998 (p. xii). The report makes a number of recommendations aimed ensuring that LCC issues are addressed in capability proposals, improvements are made in the accuracy and completeness of operating costs and the process for estimating the long-term effect of a new piece of equipment on the operating cost budget is refined. These recommendations were agreed to by Defence.

**3.29** Subsequent to the modification of the ships, the LCC should have been regularly updated as knowledge of the ships' condition and their final capabilities improved. This would have assisted Defence planning by allowing all LCCs associated with the capability to be identified and budgeted for at an early stage (for example, operating and personnel costs). A detailed LCC analysis of the LPAs has not yet been undertaken.

## Recommendation No.1

**3.30** The ANAO *recommends* that Defence undertake a life-cycle costing analysis of the LPAs so that all costs associated with their operation are known and are budgeted for at an early stage.

### *Defence response*

**3.31** Agreed. Support Command (Navy) continues to develop the life-cycle costs of the LPA. Support Command has budgeted for the operating costs, excluding personnel costs, in their FYDP [Five-Year Development Plan] submissions. At this stage these budget figures are necessarily extrapolations and estimates from empirical data. They lack the thoroughness required for detailed life cycle budgeting and support, but this will improve as operating experience is gained with HMAS *Manoora*. The figures will be monitored and updated accordingly.

## Lesson to be learned

**3.32** Life-cycle costing analysis is important in the early stages of the capability development process by assisting in decisions on the most cost-effective capability option. It is also important in the later stages, as it allows known costs to be refined and new costs to be identified and adequately budgeted.

### *Operating costs of LPAs*

**3.33** The ANAO asked Support Command Australia (SCA(N)) for information on the annual operating costs of the LPAs. Operating costs include ship repair and maintenance, materiel support requirements and technical and engineering support contract costs. SCA(N) responded that in May 1999 it had estimated the annual cost of operating each LPA to be in the order of \$30 million per year<sup>38</sup> but that further refinement of LPA operating costs in preparation for the 2000–04 Five-Year Development Plan (FYDP) '*is leading to figures in the order of \$15 million per ship.*'

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<sup>38</sup> This figure was developed by first extrapolating *Tobruk's* operating costs and then refining that data using an American commercial database of ship operating costs. One LPA is estimated by Navy to be approximately 1.3 times the size of *Tobruk*.

This figure includes planned maintenance, repairs to 'occasional defects', spares support and technical assistance costs but excludes fuel costs (estimated at \$2.7 million per ship) and personnel costs associated with crewing the LPAs (estimated by the ANAO to be \$10.35 million annually per ship)<sup>39</sup>.

**3.34** SCA(N) documents indicate that the operating costs of the LPAs can be expected to be relatively higher than those of other classes of ships operated by the RAN, for several reasons: the age of the ships (hull degradation and auxiliary systems supportability can be expected to represent a significant cost); their expected high rate of effort (and associated spares usage); and the fact that there are only two ships (consequently Navy is unable to spread the set-up costs over a larger number of ships, as it is able to do with other classes of ships).

**3.35** Although the ships were purchased in 1994 and Defence is concerned about its present financial situation, funding for the operating costs of the LPAs was not programmed until 1999.

## Value for money considerations

**3.36** Once the two ships have been delivered and accepted into naval service, it is expected that they will significantly enhance the amphibious lift capabilities of the Australian Defence Force (ADF). The project's value-for-money (VFM) is difficult to assess. For example, to compare the ships with a single new ship of similar capabilities (as proposed by Defence in 1993 at a cost of \$494 million) would require detailed consideration of life-cycle costs and Australia's amphibious lift capability requirements. A VFM judgement on this basis would need to take into account the following factors:

- the time-frame and cost required to acquire and modify the LPAs relative to those required to build a new ship;
- the number of personnel required to crew both LPAs relative to that required of a large new ship. (Navy is experiencing personnel shortages in some key areas. The new build option would have provided opportunities to incorporate labour-saving technology);<sup>40</sup>
- the operating costs of the LPAs compared with those of a new build. (Although a substantial amount of repair and refit money has already

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<sup>39</sup> The ANAO estimates, using Defence's *Ready Reckoner on Personnel Costs and Related Overheads* (February 1998), that the annual full recovery cost of an LPA crew is \$10.35 million. The latter assumes an average cost per crew member of \$57 500 (Able Seaman (ACT)) and a crew of 180 but excludes the Ships Army Detachment.

<sup>40</sup> See ANAO Performance Audit Report No.35 1999–2000 *Retention of Military Personnel—Australian Defence Force*, April 2000 p. 32.

been spent on the LPAs, being 30 years old they will still require a relatively high level of ongoing maintenance);

- the value placed upon the operational flexibility and reduced combat risk offered by two LPAs with equivalent capability compared to that of a single new ship; and
- the expected service-life from each of the options. A new-build would have a planned life of 30 years, compared with the LPAs' remaining life of 15 years. It is also noted that the LPAs are to be retired in 2015 during a period of ADF equipment 'block obsolescence'<sup>41</sup> and associated funding shortages, whereas a new build would have been retiring in 2030.

**3.37** The original acquisition did not proceed on the basis of a detailed assessment of the relevant factors. Since the acquisition, there has been a significant amount of extra cost and delay in making the two ships ready. As a result of the considerable cost and schedule overruns, the ships' relatively high ongoing maintenance and crewing costs and their relatively short life-span, the ANAO considers that any VFM advantage apparently provided by the LPAs over the acquisition of a new ship has been dissipated, or at least significantly eroded. However, without a detailed analysis, it is impossible to be definitive on this issue.

## Conclusion

**3.38** The capability development process has effectively occurred in reverse on this project, with detailed capability guidance being developed only after modification work on the ships had begun. This has contributed to project cost increases and schedule delays. A life-cycle costing analysis comparing the various capability options and supporting the proposed acquisition of the ships was not undertaken. The lack of a whole-of-capability approach has resulted in the need for additional funding to allow the ships to meet some operational requirements.

**3.39** After modification, the ships will provide the ADF with a number of useful capabilities, but there is evidence that *Manoora's* capabilities do not fully meet the specified operational requirements. The ships' operating costs are expected to be relatively higher than those of other classes of ship operated by the RAN. Any value-for-money advantage apparently provided by the LPAs over the acquisition of a new ship has been dissipated, or at least significantly eroded.

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<sup>41</sup> 'Block obsolescence' is the term used to describe the problem arising from around 2005 to 2020 when a large proportion of ADF equipment becomes obsolete in terms of its inability to be maintained or its inability to match potential threats.



HMAS *Manoora* proceeding on sea acceptance trials

## 4. Project Cost and Schedule

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*This chapter discusses the main reasons for the project cost increases and schedule delay, the impact they have had on Defence and how cost and schedule is monitored by the Project Office. It also outlines efforts by the Project Office to improve the management of cost and schedule and the opinions of the main parties on current project schedule and funding.*

### Project cost increases

**4.1** The contract with Forgacs to modify the ships was signed in May 1996. In the period since then, total project cost has increased from \$125 million (Phase 1 \$70 million and Phase 2 \$55 million) to \$395.1 million. Project cost includes contract cost. In the same period, the latter has increased from \$55 million to \$203.8 million. The Project is funded from several Defence sources, but mainly from the Defence Acquisition Organisation (DAO) major capital equipment budget and the Support Command Australia (Navy) repair and refit budget. Increases in project cost can be primarily attributed to expenditure in three main areas: repair and refit work; capability additions; and emergent work.

#### *Expenditure on repair and refit work*

**4.2** The primary reason for the major increase in project cost has been the large increase in the amount of repair and refit (R&R) work undertaken on the ships. Repair and refit work, generally funded by SCA(N), is of the following kinds: repair and refit of hull and systems; maintenance of existing systems, machinery and equipment; habitability upgrades; configuration changes; and a naval communications upgrade. Systems include pipe-work and mechanical and electrical systems.

**4.3** Since September 1995, when ADI undertook repair and refit work on the ships, SCA(N) has spent a total of \$142 million on repair and refit of the ships. Although there has been some supplementation of the repair and refit budget, most of these funds were not budgeted and have been sourced from funds set aside for the repair and refit of other RAN ships. Navy acknowledges that this will have a detrimental, and as yet unquantified, impact on the maintenance levels of the remainder of the fleet and therefore its future reliability. Early in 2000 SCA(N) received further supplementation of \$56 million to cover contract extension claims made by Forgacs and to complete the modification of *Kanimbla*.

**4.4** The ANAO considers that SCA(N) repair and refit funds should not have been used to bring what was essentially a new capability into

RAN service. Sufficient new capital funding should have been budgeted to bring the ships up to normal RAN standards and for incorporation of planned capabilities prior to the ships being commissioned into service.

### **Lesson to be learned**

**4.5** To provide adequate focus on management of major projects, new military capabilities should be funded from Defence's major capital equipment funds rather than from its repair and refit funds.

#### *Acquisition of the ships*

**4.6** The ANAO considers that the large increase in repair and refit expenditure is primarily attributable to inadequacies in pre-acquisition surveys of the ships. A number of areas in Defence involved in development and consideration of the acquisition proposal criticised it on several grounds. Particular concerns related to: the short period for development of the proposal; heavy reliance on professional judgement to overcome gaps in knowledge about the actual condition of the ships; the source of costing information; and the lack of a comprehensive through-life assessment. Questions were also raised about the quality of the assessment of the condition and supportability of the ships.

**4.7** The ANAO found evidence indicating that, although the surveys of the ships were adequately planned, the actual surveys were not well executed. The Inspection Team had consulted a number of sources of information regarding the condition of the ships, including US Navy inspection reports, operational trials, and maintenance and hull survey records. The Team also spoke with US Navy officials, the ships' crew and a representative from the company responsible for undertaking contracted maintenance on the ships.

**4.8** Problems with the pre-acquisition surveys identified by the ANAO include:

- over-reliance on information provided by the US Navy on the condition and maintenance history of the ships;
- time pressures on the RAN Inspection Team because of the availability of surplus funds in 1993–94 and other countries' interest in acquiring US Navy ships of this particular class;
- the inability to conduct a dry dock examination of the ships' hulls and to access key areas of the ships due to the ships still being in US Navy service at the time of survey; and
- the inability to conduct effective sea trials and tests of the ships because of equipment failure.

**4.9** As a result, the Inspection Team made a number of assumptions about the condition of the ships. For example, because of problems in accessing some ballast tanks, assumptions were made about these tanks based on the condition of those that were inspected. A November 1999 SCA(N) document commented that:

*The original state of the base vessels was poorly identified and the focus of production activities to date has continually highlighted additional shortfalls in the material condition of each vessel.*

**4.10** The ANAO noted that the Inspection Team did not consider crew habitability standards and ship configuration changes that would be required to meet RAN standards. Significant deficiencies in these areas have resulted in substantial cost increases during Phase 2 of the Project. For example, Navy has required that the galleys be converted from their US Navy configuration for storage and preparation of pre-packaged meals to the RAN's requirements for storage and preparation of fresh foods.

**4.11** Differences between rank structures in the USN and the RAN have also required substantial configuration changes to be made to the ships. The habitability of the embarked troop accommodation was later assessed as below ADF standards and has required upgrade. Another area that was not assessed during the inspection was the need for an appropriate air-conditioning capacity. The ships were designed for US Navy operations in the North Atlantic and required little cooling capacity. The ANAO understands that the operational environment for them in future will be in tropical areas to Australia's north.

**4.12** Defence personnel involved in the inspection and evaluation of the ships were experienced but, for reasons indicated above, the amount of work to bring the ships to RAN operational standards was significantly underestimated. SCA(N) representatives advised the audit team that, in their opinion, the information provided by the USN on the ships' condition was not of high quality. However, as the USN had proposed to dispose of the ships for their scrap value, they had little incentive to provide detailed records on the ships and their maintenance history.

**4.13** In his media release of 3 February 2000, the Minister identified, as one of the lessons to be learned from this project, the need for properly conducted pre-procurement inspections, particularly of second-hand materiel. The ANAO's findings support the need for Defence to be an informed buyer and require more rigorous appraisal of second-hand materiel. In relation to second-hand ships, qualified and experienced personnel need to make a detailed examination of the ship's condition. This requires full access to the ship and a dry dock examination of its hull.

## **Lesson to be learned**

**4.14** The risks inherent in the purchase of a second-hand ship call for qualified and experienced personnel to make a detailed examination of its condition. The examination requires sufficient time, full access to the ship and a dry dock examination of its hull.

### *Expenditure on capability*

**4.15** An important part of Phase 2 of the project is the incorporation of new capabilities in the ships through a number of capability work packages. These packages are funded by the Defence Acquisition Organisation (DAO). There have been a number of increases in DAO Phase 2 funding, but they have not been of the same magnitude as the SCA(N) funding increases. At May 1996, approved Phase 2 DAO funding was \$55 million but, at the time of audit, it had increased to approximately \$121 million (see Table 1, following paragraph 2.28). There have been two main increases in DAO funding during the project: the \$36 million increase approved in December 1997 and provision of \$20 million<sup>42</sup> approved in 1998 to allow safe and effective helicopter operations from the ships. At the time of audit, total approved DAO funding stood at just over \$183 million (see Table 1).

### *Expenditure on emergent work*

**4.16** Another major cause of project cost increases has been 'emergent work'. As successive areas of the ships were opened up, either for capability or refit work, the need for substantial emergent work was discovered. Navy's view was that, once the need for this work was discovered, it would have been negligent not to undertake it while they had access to the affected area. It was considered that, if the work was not undertaken, it would result in higher maintenance costs for Navy in the long term. At the time of contract signature, \$4 million had been provided for emergent work. At the time of audit, emergent work placed with Forgas had increased to \$53.7 million.<sup>43</sup> The latter figure is expected to increase before the delivery of *Kanimbla*. The figures indicate that SCA(N) has been responsible for approximately 80 per cent of all emergent work.

### *Contract extension costs*

**4.17** Contract extension costs have also resulted in increases in total project cost. As a result of Defence's request for substantial additional

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<sup>42</sup> These funds were approved to allow safe and effective helicopter operations from the ships. They are not managed by the Project Office.

<sup>43</sup> Does not include SCA(N) funding recently approved for additional emergent work.

work and subsequent delays to the completion of contract, Forgacs sought and received payment for additional project management and other overhead costs (Chapter 5 discusses contract extension costs).

### *Provision for set-to-work and tests and trials*

**4.18** The original funding proposal made no provision for ‘set-to-work’ of machinery. Set-to-work funds are normally provided to allow maintenance work to be carried out on machinery and equipment that has lain dormant during a modification/refit period. In the case of *Kanimbla’s* machinery and equipment, this may be a period of over four years, and is considered a high risk to meeting *Kanimbla’s* delivery schedule.

**4.19** In addition no funding provision had originally been made for tests and trials of the ships’ capability after their delivery to Navy. A May 1997 brief to the Chief of Navy noted that ‘Funding sources for post delivery trials namely Naval Test, Evaluation and Acceptance (NTE&A), which includes sea trials and Light Off Examination have yet to be identified’. The ANAO found that funding for tests and trials and set-to-work requirements was provided for in later funding approvals. For example, \$3 million was provided for tests and trials in the \$36 million increase in DAO funding approved in December 1997 and \$3.5 million was provided for set-to-work purposes as part of the \$14.5 million increase in SCA(N) funding which was also approved in December 1997.

## **Guidance on project cost increases**

**4.20** In July 1999, Defence’s Inspector General drew senior officers’ attention to Management Audit Branch’s second report on the project. He suggested that they ‘might like to consider whether to continue to pursue the project in full’ and that guidelines were needed on ‘when real increases in projects are of such magnitude that serious consideration should be given to their cancellation.’

**4.21** The ANAO is unaware of any response to this suggestion but can see merit in it. Without such guidance, there is a risk that major cost overruns on a project can place a significant burden on the Defence budget and have unexpected effects in other areas (for example, the effect of rising LPA project costs on repair and refit of other Navy ships). A similar effect can result from incremental cost increases on a project that are individually minor but accumulate to a significant increase. The ANAO considers that, as part of general project monitoring, Defence should develop guidance to assist in deciding at key review points whether a project experiencing significant real increases in total cost should proceed, be modified or be cancelled.

## Recommendation No.2

4.22 The ANAO *recommends* that, as part of general project monitoring, Defence should develop guidance to assist in deciding at key review points whether a project experiencing significant real increases in total cost should proceed, be modified or be cancelled.

### *Defence response*

4.23 Agreed. In the first quarter to 1999 a Defence team investigated the feasibility and options for delivering and introducing into naval service the LPAs as early as practicable. Six options were considered in detail in their report *Options for Early Delivery of LPAs*. The recommendations of the team to the Chief of Navy was for the contract to continue. The Defence Materiel Organisation (DMO) has recently been formed by the merging of the Defence Acquisition Organisation (DAO), Support Command Australia (SCA) and National Support Division (NSD). DMO will facilitate whole of life materiel management, and provide a single line of accountability for acquisition and through life support of Defence equipment and systems.

## Schedule delays

### *Pre-contract delays*

4.24 The contract to modify the ships was to be signed in August 1995 for delivery of both ships in July 1996. However, signing was delayed until May 1996. Defence attribute the delays to: a lengthy tendering process (requiring extensive clarification with the three tenderers); delays in progressing the Source Evaluation Report through various Defence committees; and a change of Government in March 1996.

### *Post-contract delays*

4.25 The contract was originally to be completed in 14 months, that is, four months for design work and 10 months for production activities. At the time of contract, the expected delivery dates for *Manoora* and *Kanimbla* were 30 June 1997 and 7 July 1997 respectively. *Manoora* was delivered to Navy on 26 November 1999. Should *Kanimbla* be handed back to Navy on new planned delivery date, the contract will have taken a total of 44 months to complete.

4.26 In January 1998 Forgacs wrote to the LPA Project Director about delays, as seen from Forgacs' perspective. Forgacs identified the following as having an adverse impact on the overall project schedule:

- (a) *the slow decision making process within the Commonwealth, specifically for additional work e.g. Insulation Replacement;*

*(b) the piecemeal feed of additional work resulting in constantly changing S.O.W. [statement of work] with resultant schedule impact to the project;*

*(c) the huge amount of additional work turned on since original contract signing; and*

*(d) the delay in delivery of GFE/GFI.<sup>44</sup>*

**4.27** Project Office records indicate that scheduled delivery dates slipped continually throughout the project (see Appendix 7 for primary reasons for project schedule slippage throughout the project). The Project Office had some concerns about Forgacs' capacity to meet the schedules that Forgacs itself produced. In practice, the Project Office regarded Forgacs' monthly billings as a guide to actual project progress.

**4.28** With the end of the project now in sight, the following appear to be the main reasons for the significant slippage in project schedule: an underestimation of design work complexity before the contract began; placement of additional work (capability; repair and refit; and emergent work) after the contract began; and delays in providing Government Furnished Equipment to the contractor. These are summarised below.

### *Design work delays*

**4.29** After contract signature, a six-month delay in designing capability upgrades prevented production work from beginning in earnest. A Project Office document of August 1997 commented that the design packages for the LPAs being developed by Forgacs sub-contractor were *'highly interrelated and complex which has necessitated a considerably longer than anticipated period to complete, delaying Forgacs in committing resources to production work'*. Clearly, the complexity of the design work had been underestimated.

### *Placement of additional work with the contractor*

**4.30** A large amount of additional capability and repair and refit work was placed with Forgacs after contract signature. This extra work, in turn, resulted in the need for substantial amounts of emergent work, as new areas of the ship were opened up and equipment overhauled. Delays were compounded because the sequential placement of this additional work required several processes: the Project Office to scope the work; Forgacs to cost and quote on the work; the Project Office to verify the quotes; funding to be sought and approved; and design work to be undertaken. These processes were required every time additional work

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<sup>44</sup> Government Furnished Equipment/Government Furnished Information.

was placed with Forgacs before any production work could begin. In his opening remarks to the Deputy Chief of Navy (DCN) Round Table members in June 1998 the DCN noted that *'almost since contract signature with Forgacs, new work has been placed with them in a disjointed fashion as funding has become available. This has not been conducive to the smooth progress of the work and has invariably impacted on schedule'*.

**4.31** The MAB's second report on the LPA project (paragraph 1.5 above) commented that *'Changes in the scope of work and growth in emergent work required made it more difficult for Forgacs to plan ahead and manage its production schedule.'* The ANAO agrees and considers that sequential placement of considerable additional work with Forgacs caused problems for Forgacs in managing the project. Despite Defence's concerns about Forgacs' ability to manage the increasing scope of work, Defence continued to place additional work with Forgacs throughout the contract.

#### *Delays in delivery of Government Furnished Equipment*

**4.32** It was agreed in the contract that Defence would provide certain items known as Government Furnished Equipment (GFE). There were several instances where Forgacs claimed that, because of Defence delays in delivering GFE, the overall project schedule had been delayed (for example, delivery of the RAN Communications Package and medical facility GFE). The Project Office contested a number of these claims on the grounds that Forgacs had not advised that the particular item of GFE was critical to meeting the overall project schedule; how the delay would affect the overall schedule; or what steps Forgacs had taken to limit the impact of the delay on project schedule.

**4.33** A briefing paper for the October 1999 meeting of DAO's Defence Acquisition Review Board (DARB) stated that delays in relation to GFE *'is not a new problem as it occurs with virtually every project. GFE should be restricted to the absolute minimum to avoid contractors pointing the finger at the Commonwealth for delays.'* The Ship Service Diesel Generators (SSDGs) and the 70 tonne cranes were cited as examples of GFE whose provision had been delayed on the LPA project.

**4.34** The Head of the LPA Delivery Team advised the ANAO that the amount of GFE to be delivered by Defence should be limited in future projects, as he considered that contractors were generally better able to manage the risks inherent in procuring such equipment. The ANAO considers that Defence should agree to provide GFE for a project only where it has assessed that it can gain an advantage for the Commonwealth in doing so and that it is confident of delivering on time. (See also paragraph 6.20, last sub-paragraph.)

## Recommendation No.3

4.35 The ANAO *recommends* that, to avoid the risk of project schedule delay arising from the provision of Government Furnished Equipment (GFE), Defence contracts provide for delivery of GFE only where there are clear advantages for the Commonwealth in doing so and Defence is confident of delivering on time.

### *Defence response*

4.36 Agreed. Some items of military equipment are not available to a non-government purchaser; in these cases the Commonwealth Government must purchase the equipment and provide it to its contractors as GFE. Ownership of GFE remains with the Commonwealth. Procedures are currently being reviewed by SCA(N) to avoid the inherent risks associated in the procurement of GFE for use in a commercial contract.

### *Effect of schedule delays*

4.37 In December 1997, Defence advised the Minister that the approval of \$36 million of capital acquisition funds and \$14.5 million of repair and refit funds to finance additional work on the project '*could be accommodated in the current modification program with little or no delay [in Manoora's delivery schedule]*'. In the event, this additional work resulted in further slippage to the scheduled delivery dates. The ANAO considers that the schedule risks arising from this work should have been apparent to the Project Office, given their experience with additional work earlier in the contract.

4.38 Delays in completing the modification contract with Forgacs have had a number of adverse impacts. The delays have caused difficulties for Defence's personnel planning arrangements for the ships. There is evidence that the delays and deferments have caused disruption to Navy members and their families and have resulted in increases in entitlement and accommodation costs. The main impact of the delays, however, was that the ships were not available for the Australian Defence Force's deployment to East Timor in September 1999.

### *Ships not available for the East Timor deployment*

4.39 The amphibious heavy-lift ship HMAS *Tobruk* was to be decommissioned in 1994,<sup>45</sup> but that was deferred and, in 1997, Navy decided to keep *Tobruk* in service until 2010. Defence documents indicate that *Tobruk* was in a poor state of repair in 1998 and in serious need of a major maintenance overhaul.<sup>46</sup> To avoid a gap in the ADF's amphibious

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<sup>45</sup> It was planned that, upon *Tobruk's* retirement from service, most of its crew were to be transferred to *Manoora*.

<sup>46</sup> Due to *Tobruk's* planned decommissioning, its maintenance levels were run down after 1994.

capabilities, *Tobruk* would not undergo maintenance until *Manoora* had reached an equivalent level of capability. Delays in the delivery of *Manoora*, however, meant that a major maintenance overhaul was not possible before *Tobruk* was required for the East Timor deployment in September 1999. In his February 2000 media release the Minister said '*They [the LPAs] would have been great assets in East Timor.*' Over the 1999 Christmas period *Tobruk* underwent a two-month maintenance period. This left a gap in Australia's amphibious lift capabilities, as *Manoora* was only in the early stages of the tests and trials.

## Management of cost and schedule

### *Cost Schedule Status Reporting (CSSR) system*

**4.40** The contract required Forgacs to implement an accredited CSSR system and granted Defence access to this system. The reports generated by the system are used by the Project Office, along with other information, to monitor contract progress and cost. As Defence had not previously accredited Forgacs' CSSR system,<sup>47</sup> Defence staff, in the second half of 1996, reviewed the system and identified several issues that required addressing before the system could be accredited. By November 1996, Defence staff decided that Forgacs had implemented a CSSR management system that complied with the Commonwealth's requirements<sup>48</sup> and recommended that Forgacs' system be accepted. The review also recommended that the Project Office review Forgacs' CSSR reports each month; have regular discussions with cost account managers; and discuss issues with the CSSR administrator. This was to avoid the need to develop a formal surveillance plan.

**4.41** In September 1997, a surveillance review of Forgacs' CSSR system identified a number concerns (primarily the poor quality of forecast data) and concluded that there would be a 2–3 months' slippage in the planned delivery date. A follow-up review in November 1997 found that, despite significant improvement, particularly in relation to scheduling and forecast information, further improvement could be made by reviewing the schedule baseline control to maintain baseline integrity between Forgacs' cost and schedule systems. The report indicated that a review by Project Office staff should be sufficient to resolve the outstanding issues.

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<sup>47</sup> Forgacs' project management system is based on the scheduling tool 'Open Plan Professional' and the 'Cobra' cost management system. These two systems are data compatible and record and manage all project cost and scheduling data. Performance is measured and reported against an established baseline by comparing earned value reported on a particular date with the amount and cost of work that was planned to be achieved at that date.

<sup>48</sup> DEF(AUST) 5658 Cost Schedule and Reporting Specification and Guide.

**4.42** At the time of the audit the Project Office advised the ANAO that Forgacs' CSSR systems baseline had not been reset for some time and that the system was unreliable for monitoring actual progress against schedule. The main cause of this had been the incorporation of the large amount of additional work into the contract. The Project Office indicated to the ANAO that most CSSR systems would have difficulty incorporating the amount of additional work that Forgacs' system has been required to incorporate. The Project Office advised that Forgacs has since applied *Kanimbla's* new schedule to the baseline and that Forgacs' CSSR system would be reviewed again in the near future.

**4.43** In response to the proposed audit report, Forgacs advised the ANAO that in May 1997 it had advised the Project Office that the practice of 'drip feeding' work to them was severely affecting the company's productivity performance and making reliable planning very difficult. Forgacs stated that the practice of 'drip feeding' work has continued throughout the contract; and that the project schedule 'quickly became out of date due to the massive increase in man hours per month and as well the CSSR baseline became meaningless as was the relevancy of the management information provided by the CSSR system.'

## Improvements in the management of cost and schedule

**4.44** The Project Office advised the ANAO in May 2000 that it was undertaking the following activities in relation to cost and schedule issues to place the project on a more 'business-like footing':

- seeking improvements in the detail and timeliness of monthly progress reports provided by Forgacs and the Project Director's Representative (PDR) and scrutinising these reports to ensure the early detection of slippages in the project's baseline;
- regularly reviewing Forgacs' CSSR system to ensure that the reports it generates are accurate and that deviations from the schedule are identified early;
- focusing the PDR Office<sup>49</sup> staff on the critical items that need to occur each month to maintain the project's cost and schedule parameters; and

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<sup>49</sup> The LPA Project Office (located in Canberra) also has an office with approximately 10 staff on site at Forgacs' Dockyard in Newcastle. The office is commonly referred to as the Project Director's Representative (PDR) Office and its role is to oversee work on the ships, on behalf of the Project Office. The office is the first point of contact with Forgacs regarding resolution of issues relating to contracted work. It also provides monthly progress reports to the Project Office.

- refusing any new work unless it affects *Kanimbla's* ability to go to sea safely. The ANAO is aware of actions taken by the Project Office to reject additional project expenditure and to ensure that contracted items have been delivered.

### *Opinions on current schedule and budget*

**4.45** The Project Office did not envisage that any further funding would be required to complete the project and that the revised delivery date for *Kanimbla* of 28 September 2000 was achievable. However, the Head of the LPA Delivery Team (LPADT) indicated to the ANAO that he was not confident that the delivery date could be met or that current funding was adequate. At the Delivery Team meeting of 28 March he stated that *'the current delivery schedule is optimistic at best.'* He considered that *Kanimbla* may be delivered in November 2000 and that additional funding would be required, but not of the magnitude previously sought. (He indicated in the order of several million dollars.) The main reason he gave for expecting further schedule slippage and the need for additional funding requirements was that insufficient time and funds had been allocated for *Kanimbla's* set-to-work phase.

**4.46** SCA(N) considered that the current delivery date was 'very tight.' They expected *Kanimbla* to be delivered late in October/early November 2000 without the need for additional funding to complete the project. SCA(N) indicated that they would be monitoring the expenditure of their funds closely. Since November 1999, SCA(N) has had a Navy representative in the PDR's Office to monitor expenditure of approved funds and scrutinise requests for additional SCA(N) funding. SCA(N) consider that this will guard against non-essential work and reduce schedule risks.

**4.47** Defence's response to the proposed audit report (August 2000) indicated that it expected Forgacs to apply to revise the Vessel Acceptance Date from 28 September to 31 October 2000 and that no additional costs would result from this change. The response also stated that Defence *'believes the ship will be in Sydney before Christmas 2000.'* Forgacs' response to the proposed report confirms that the completion date has been extended by four weeks to 31 October 2000. Their response goes on to state that the *'reason for this extension is late approval by the Commonwealth of additional capabilities together with the recently identified need to replace an extensive quantity of ships electric cabling and the addition of an extra 37 000 man hours into the schedule for additional work since February 2000.'*

## Lesson to be learned

**4.48** Prior to the placement of any additional work after contract signature, the work should be closely examined for its overall cost effectiveness and its likely impact on budget and schedule.

## Conclusion

**4.49** Since May 1996, total project cost has increased from \$125 million to \$395.1 million. This includes the increase in contract cost from \$55 million to \$203.8 million. The contract was originally envisaged to take 14 months to complete but may now take 44 months. The primary reason for the cost increase and delay has been the large amount of unplanned additional repair and refit work, capability work and emergent work placed after contract signature. Other reasons include: an underestimation in the complexity of the design phase; delays in delivery of Government Furnished Equipment (GFE); and no provision for certain working in the original funding proposal (for example, provision for set-to-work and tests and trials). Placement of the additional work has adversely impacted on the contractor's Cost and Schedule Status Reporting (CSSR) system, reports from which are used by the Project Office to monitor contract progress and cost.

**4.50** The majority of additional funding has been sourced from funds set aside for repair and refit of other RAN ships. This is expected to have a detrimental, and as yet unquantified, impact on the maintenance levels of the remainder of the fleet and therefore its future reliability. A number of initiatives aimed at improving the management of cost and schedule are being undertaken by Defence but there are indications that the revised delivery date for *Kanimbla* may not be met and additional funding may be required.

## 5. Contract Issues

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*This chapter examines several issues concerning the contract, including Defence's choice of a 'firm price' contract, the processing of contract changes, contract extension costs and current efforts by the Project Office to improve contract management.*

### Selection of contract type

**5.1** The contract with Forgacs is a 'firm price' contract. It was signed with Forgacs on 6 May 1996 for \$55 million.<sup>50</sup> Under a 'firm price' contract a lump sum is payable in progress payments on achievement of agreed milestones. The contract contains clauses on Contract Change Proposals, Engineering Change Proposals (ECPs), Emergent Work Change Proposals (EWCPs) and guidance on allowable costs and man-hour rates applicable to any additional work by Forgacs. It also includes clauses that address delays caused by the contractor or the Commonwealth and delays outside the control of either party.

**5.2** The contract provided that pricing of contract change proposals (additional work) would be based on labour rates used in the tender. Defence documents at the time indicate that there would be 'extensive growth work'. It was unclear to the ANAO whether the growth work would relate to capability, emergent or additional repair and refit work.

**5.3** Management Audit Branch's second audit report (June 1999)<sup>51</sup> on the project commented as follows:

*Firm price type arrangements are usually for low risk, low value contracts with a contract term of less than two years (see the Defence Procurement Policy Manual paragraph 4.208). Consistent with this, CEPMAN 1 guidance at paragraph 6, Appendix 1 to Annex C to Chapter 6, states:*

*A firm price contract is one in which the price and all other conditions remain unchanged during the course of the contract unless the scope of the task (eg quantity) is altered sufficiently to impact on the price. Such contracts rely on the premise that the contractor could be expected to estimate the cost of supplying the required goods or services with reasonable accuracy...*

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<sup>50</sup> The Contract includes a clause that states that, 'the Contract price is unalterable for variations in the cost of labour, materials and for fluctuations in exchange.'

<sup>51</sup> See paragraph 1.5.

*There is little inducement for Forgacs to accelerate the production schedule [under a firm priced contract] since this involves additional costs in the form of temporary labour hire which cannot be recovered. ...a better contract type would have shared carefully defined risks and contained incentives for early delivery.*

5.4 Similarly, the LPA Project Director (LPAPD) noted in an August 1999 minute to Head of Systems Acquisition (Maritime and Ground) that *'In hindsight, it is apparent that the Contract was not an entirely appropriate or adequate instrument to address the significant increase in work that has been progressively placed with Forgacs'.*

5.5 A 'firm price' contract places the risk of schedule delays and cost increases (during the contract) with the contractor, but Defence's placement of considerable additional work with the contractor after contract signature and consequent schedule delays have meant that some of the advantages of this contract type have been lost (for example, a number of price increases and contract extension costs have been approved). The evidence indicates to the ANAO that it would have been preferable for Defence to have considered different kinds of contract in 1996.

5.6 In response to the proposed report (August 2000) Defence made the following comments on the selection of a firm price contract for the project:

*While a Variable Price contract would have readily provided for the changes to the contracted labour rates that occurred, it could be argued that Firm Price and Variable Price contracts are equally unsuitable for tasks of this nature. With the benefit of hindsight, an Incentive Fee or similar contract, which aims to share the risk and give reward for innovative solutions and work practices would have been more appropriate.*

## **Project office staffing**

5.7 In November 1997, the then Project Director reported to the HSA(M&G) that *'I submit that I am currently in dire states with project staffing.'* He stated that shortages were being experienced because of staff leaving the project and sick leave absences in important management positions without backup resources. In particular he sought agreement in recruiting a *'competent Planning Manager ASAP'.*

5.8 In a briefing paper for the February 1999 meeting of the Chief of Navy Round Table, the LPA Project Director stated that *'delays have been caused more by lack of the right staff mix rather than numbers.'* At the October 1999 Defence Acquisition Review Board (DARB) meeting he also states

that *'while staff turnover had not been especially rapid, the problems had been exacerbated by the lack of appropriate staffing structures and procedures. He identified the problems as being primarily the caused by 'a lack of appropriately skilled staff when required.'* There are apparently still some concerns of this nature.

**5.9** There have been shortages in engineering, finance and contracting areas at various stages of the project. For example, the minutes of the Deputy Chief of Navy (DCN) Round Table in February 1999 indicated that the Project was *'suffering from a shortage of Engineers and a Finance Manager'*.<sup>52</sup> These shortages have resulted from peaks in workload caused by the placement of additional work with Forgacs, such as the need for engineering staff to verify the cost proposals submitted by the contractor. The Project Director advised the ANAO that there were now no shortages in these areas within the Project Office.

**5.10** There has been substantial turnover in key positions within the Project Office. A briefing paper developed for the October 1999 DARB review of the LPA project stated that there had been four Project Directors; four different Business Managers; five Integrated Logistics Support (ILS) Managers; four Finance Managers; and vacancies in the Contracts Manager and the Operations Manager positions. The briefing paper also noted that *'corporate knowledge is starting to decline and this has caused delays in the decision making process.'* The Project Office informed the ANAO that the rate of turnover of project staff was not excessive for a project of its size and nature.

**5.11** The ANAO considers that significant turnover of key staff and a lack of appropriately skilled staff have adversely affected the performance of the Project Office in managing the Contract. Reports by the Joint Committee of Public Accounts and Audit (JCPAA) and the ANAO have previously identified the high turnover and skill level of DAO project staff as an issue to be managed by Defence.<sup>53</sup>

## Processing of contract changes

**5.12** Both the Project Office and Forgacs had considerable difficulty in processing the necessary contract changes required for the large amount of additional work in accordance with the contract. Neither party has met all contractual requirements. A number of agreed price changes do

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<sup>52</sup> DCN Round Table Meeting (agenda item number 7) 24 February 1999.

<sup>53</sup> For example, see Chapter 8 of Audit Report No.13 1999-2000 *Management of Major Equipment Acquisition Projects—Department of Defence*.

not accord with the original terms and conditions of the contract. For example, two increases to hourly rates were approved by the Project Office, although the contract states that pricing of additional work for the duration of the contract is to be based on the rates originally tendered by Forgacs.

**5.13** The ANAO understands that the Project Office received advice about the contractual consequences of not following the change procedures set out in the contract.

## Contract extension claims

**5.14** The Project Office did not follow the change procedures set out in the contract in relation to Forgacs' contract extension claims. Since April 1997, Forgacs has submitted a number of Contract Change Proposals (CCP's) and claims for additional payments. The basis of these claims was that, as a result of delays caused by the placement of considerable additional work, Forgacs had incurred increased project management costs and other overheads costs.<sup>54</sup> The total value of these claims as at December 1999 was \$56 million.

**5.15** Defence's Financial Consultancy and Investigation Services—Navy examined the claims and found that some costs had been incurred but others had not. The latter were therefore rejected. The Project Office later engaged PricewaterhouseCoopers to undertake an independent review of the claims. Their report (June 1999) commented on the effect of the difference in scale between what was sought in the original contract and what was currently sought from the contractor. The ANAO understands that Defence had considered tendering some of the additional repair and refit work but concluded that value-for-money could be attained by placing this work with Forgacs.

**5.16** The ANAO was advised that the Project Office had received conflicting legal advice on how Forgacs' contract extension claims should be addressed. The Project Director recommended to HSA(M&G)<sup>55</sup> in August 1999 that, subject to specialist legal advice, the dispute resolution clauses in the contract be invoked. It was decided, however, to settle the outstanding claims with Forgacs by direct negotiation.

**5.17** On 3 May 2000, the Project Director signed a Deed of Settlement with Forgacs regarding its contract extension claims. The Deed provides for a settlement amount of \$17 million, with an additional \$2 million to

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<sup>54</sup> Minute from LPAPD to DAO Executive LPA 912/99 of 13 August 1999.

<sup>55</sup> Head of Systems Acquisition (Maritime and Ground).

be paid to Forgacs on delivery of *Kanimbla* to Navy by 28 September 2000. The settlement includes an amount of \$4 million for additional facilities and security costs incurred by Forgacs (such as electricity, water, security, sullage and some contractor overheads). These were previously assessed as allowable under the contract. The settlement figure is to be funded wholly by SCA(N), which had earlier sought and gained funding this amount.

**5.18** It is apparent that Forgacs' contract extension claims should have been addressed using the clauses relating to contract delays. Instead, however, there have been a number of changes approved and payments made outside the contract for project management and other overhead costs. Agreements were also made, on at least one occasion, with Forgacs concerning the sharing of responsibility for increases in project management costs. For the period October 1997 to January 1998, it was agreed that the costs would be apportioned 60 per cent to Forgacs and 40 per cent to the Commonwealth.

## Improvements in contract management

**5.19** The Project Office is seeking to improve management of the contract. Settlement of Forgacs' contract extension claims (above) is an example. Other examples include the incorporation of a delivery date for *Kanimbla* into the contract and a review of contract terms and conditions.

### *Delivery date for Kanimbla*

**5.20** As a result of numerous delivery date slippages, the delivery date for *Kanimbla* had not been formally revised in the contract. The ANAO was advised that the Project Office had negotiated a delivery date for *Kanimbla* with Forgacs of 28 September 2000 and that this date had been incorporated into the contract. The Project Office considers that placing an achievable delivery date in the contract gives both parties something firm to work towards; manages stakeholder expectations; and allows better monitoring of the contract.

### *Review of the terms and conditions of the contract*

**5.21** The Project Office advised the ANAO that in March 2000 it reviewed all contract clauses because some clauses were '*no longer workable in the current environment and others had never been workable*'. Some contract clauses have been renegotiated to reflect project realities and to enable the Project Office to manage the project in a more professional and constructive manner.

**5.22** An example concerns the original contract provision for two milestone payments per month. Due to the placement of a large amount of additional work on the contractor, the Project Office found it necessary to make thousands of milestone payments. The ANAO was advised that changes have been made to the relevant clause to reflect the current situation in regards to milestone payments.

**5.23** The audit team was informed that various changes (some minor) have been agreed with Forgacs and made to 25 clauses. Changes to other clauses were also considered but, because the clauses provided a historical perspective on the contract, the Project Office considered it to be in the Commonwealth's interest that they remain unaltered. The Project Office indicated that this was not an ideal situation but believed that, given the experience of this contract, no arrangement could now be totally ideal.

**5.24** The Project Office also advised that it would be enforcing the terms and conditions of the contract, acting on breaches and seeking contractual remedies where appropriate. This represents a significant change in contract management arrangements and should assist in achieving project completion. The ANAO's findings in relation to the contract highlight the importance of accurately scoping the work prior to contract signature.

## Contract value

**5.25** The value of the contract with Forgacs at May 1996 was \$55 million. Information provided by the Project Office in April 2000 indicated that the value of the contract had increased to \$203.8 million (see Table 2). As additional work is planned to be placed with Forgacs, further increases in the value of the contract are expected.<sup>56</sup>

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<sup>56</sup> In their response to the proposed report (August 2000) Defence advised that the current contract price was \$211.2 million.

**Table 2****LPA contract value (\$m)**

	<b>Commonwealth contractual commitment (1)</b>	
	<b>As at May 1996</b>	<b>As at April 2000</b>
<b>Prime Contract</b>		
DAO	47.0	74.6
Navy	8.0	76.5 (2)
Army	-	1.2
<i>Sub-total</i>	<i>55.0</i>	<i>152.3</i>
<b>Emergent work</b>		
DAO	-	12.4
Navy	-	39.1
<i>Sub-total</i>	<i>-</i>	<i>51.5</i>
<b>Total</b>	<b>55.0</b>	<b>203.8</b>

Source: Information provided by the Project Office in April 2000.

(1) Amount of Commonwealth commitment under the contract with Forgacs.

(2) Includes \$17 million for contract extension claims but excludes a \$2 million performance bonus.

## **Manoora accepted with contracted work outstanding**

**5.26** *Manoora* was accepted from the contractor with contracted work outstanding (that is, contractual deficiencies). This was achieved via a contract amendment. It is apparent that Defence agreed to accept *Manoora* with contractual deficiencies in order to allow its earliest delivery to Navy. The audit team found no evidence indicating the number of contractual deficiencies at the time of acceptance was excessive, or that the deficiencies delayed harbour or sea acceptance trials. However, the audit team was advised by the Project Office Business Manager that, at the time of *Manoora*'s delivery, the Project Office was 'not comfortable' with the amount of contractual deficiencies prior to delivery but that, in the event, the deficiencies had not impeded the progress of the project.

**5.27** At the time of audit (February–April 2000) the ANAO was advised that a 'fair amount' of contracted work still remained outstanding on *Manoora* but that Forgacs had a number of ship 'availability periods' in which to complete this work. For example, in April 2000 *Manoora* underwent a maintenance period in Sydney. Forgacs sent an engineering team to Sydney to undertake some of the outstanding work as well as defect and warranty work. SCA(N) advised the ANAO that it expected all outstanding work on *Manoora* would be completed in a July–August 2000 availability period.

**5.28** In its response to the proposed report (August 2000), Defence stated that:

*It is the experience of SCA(N) that the amount of production work outstanding on Manoora at delivery was not excessive. Further this outstanding work had been evaluated for ship and personnel safety immediately prior to delivery, and considered acceptable for the ship to proceed to sea trials and operational use. A plan was established at that time to reschedule outstanding work on a priority basis for future maintenance availabilities and to meet operational requirements.*

### **Defect and warranty items**

**5.29** The ANAO found no evidence that the number of defect and warranty items experienced during sea trials of *Manoora* was excessive. The Project Director indicated to the audit team that the number of items identified up until the date of the audit was normal for a project of this size and nature.<sup>57</sup>

## **Conclusion**

**5.30** The ANAO agrees with the MAB finding that ‘a better contract would have carefully shared defined risks and contained incentives for early delivery’. Evidence indicates that it would have been preferable had Defence given more consideration to the form of contract used, as it was known even before contract signature that there would be ‘extensive growth work’. The large amount of additional work approved for the ships has caused the Project Office and Forgacs considerable difficulties in processing the required contract changes. As a result, neither party has met all contractual requirements.

**5.31** A ‘firm price’ contract ostensibly places the risk of schedule delays and cost increases with the contractor, but the placement by Defence of considerable additional work after contract signature and the resultant schedule delays have meant that some of the advantages of this contract type have been lost. For example, despite being a ‘firm price’ contract, a number of price changes and contract extension costs have been approved. At the time of the audit, Defence’s Project Office was undertaking a number of initiatives to improve its management of the contract.

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<sup>57</sup> The LPAs are under a 12 month warranty period after delivery to Navy.



HMAS *Manoora* undergoing First of Class Flight Trials in April 2000 with a Sea King helicopter

## 6. Management of Project Risks

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*This chapter examines Defence's management of risk at various stages of the project, overseas experience with acquisition of second-hand ships for military purposes and the current risks to the scheduled completion of Kanimbla.*

**6.1** Project Office files do not indicate that a systematic risk assessment had been undertaken prior to the concept development or acquisition stages of the project. The Project Office did, however, seek to assess production and design risks prior to the start of the modification contract with Forgacs.

### Capability development/acquisition risk

**6.2** The main deliverable in the capability development stage of a project is a list of clearly agreed detailed operational requirements. The risk at this stage of the LPA project was that definitive capability guidance would be unavailable because of time pressures to acquire the ships. This risk was not identified and treated (See Chapter 3 for discussion of capability development process).

**6.3** There are numerous risks associated with the acquisition of second-hand ships. The ANAO found that these risks were not identified and treated by Defence prior to the recommendation to acquire the two ships. The risks arose from: the age of the ships; inadequate information about their condition; lack of access to the ships for survey purposes; and time pressures on Defence to purchase (due to the known interest of other countries in the ships and the availability of surplus funding in 1993–94). These risks were not formally identified and sufficiently treated.

**6.4** The ANAO also notes that in 1993 the then Department of Finance cautioned Defence about the risks associated with acquiring second-hand ships.

### Contract risk

**6.5** It is apparent that contract risks were not fully appreciated prior to selecting the particular contract type for this project. The October 1995 Equipment Acquisition Strategy (EAS) for Phase 2 of the project assessed the contractual risk associated with the modification of the ships as low. The choice of a 'firm price' contract, when Defence expected that there would be 'extensive growth work' after contract signature, was questionable (see paragraph 5.2)

## Design risk

6.6 At the time of contracting, Forgacs were not accredited for design work and therefore found it necessary to sub-contract this work. The prime contract required Forgacs to deliver design packages to the Project Office 12 weeks (August 1996) after delivery of the ships to Forgacs and final design packages 35 weeks (February 1997) after delivery of the ships to Forgacs. Outstanding design packages were still being delivered to the Project Office in August 1997.

6.7 The complexity of the design phase was underestimated by both Defence and Forgacs. Pre-contract documentation indicates that Defence considered the design work would be 'fairly straight-forward'. In the event, however, the design work was highly complex and necessitated '*a considerable longer than anticipated period to complete, delaying Forgacs in committing resources to modifications.*' The placement of additional work packages exacerbated the situation.

6.8 In 1998, the then Project Director advised that, to avoid design problems of the kind experienced in Phase 2 of the project, it may be necessary for Defence [depending upon the level of design risk involved] to develop separate contracts for design and production components of Phase 3 of the project. The ANAO agrees that, depending upon the design risks associated with a potential Phase 3 of the project, consideration needs to be given to developing separate contracts for design and production components of this Phase.

## Recommendation No.4

6.9 The ANAO *recommends* that, prior to commencement of Phase 3 of the project, Defence assess the design risks associated with this Phase and consider the costs and benefits of letting separate contracts for design and production.

### *Defence response*

6.10 Agreed, with qualification. Phase 3 is an unapproved Phase to cover further capability enhancements particularly for helicopter operations. The scope of this Phase will be defined after operational experience with the LPAs. Phase 3 will not be considered before 2004–05. The splitting of design and construction activities will not be considered if it were to substantially increase risk by splitting responsibility for the success of the project.

## Production risk

6.11 The ANAO found evidence that, prior to the start of the contract, the Project Office sought to assess production risks, established a risk database and held risk mitigation meetings.

**6.12** The Project Office's risk treatment plan identified general risks to the project and risks to particular work packages. A number of the identified general project risks at the time were not rated highly by the Project Office but later proved to be major risks to project cost and schedule. For example, risks relating to the potential for: excessive emergent work being required; the late delivery of design detail; and the contractor misinterpreting the scope of work were all assessed as medium to low risks. In addition, although the risks of insufficient contingency and late delivery of Government Furnished Equipment/Information were rated highly, they still proved to be problem areas for the project. The impact from placing additional work into the contract was not identified as a separate risk to the project.

**6.13** There is evidence that work pressures, especially in the early stages of the contract, impacted upon risk management. Significant risks were to be considered at monthly progress meetings, but this did not occur. In July 1996 the LPA Executive Officer—Business wrote to project managers stating that the project had expended considerable effort on identifying risks, establishing a risk database and that *'if this effort is not to be wasted the risks that were identified as being significant should be monitored. An activity which has largely not happened to date.'* In response to the proposed audit report, Forgacs advised the ANAO that, at the company's instigation in July 1998, a Risk Mitigation Meeting was convened with the Project Office to identify risks and prepare risk mitigation strategies with the intent of minimising the impact of schedule slippage.

#### *Inadequate contingency*

**6.14** The original modification proposal provided \$2.6 million (five per cent of the total modification cost) for general contingency and \$4 million (approximately eight per cent of the modification cost) for emergent work to be undertaken on both ships. The amount of general contingency was later increased, and funding for emergent work at 11 April 2000 stood at \$53.7 million (see Table 2). The ANAO considers that the small amounts set aside for emergent work and general contingency reflect a lack of appreciation of the production risks associated with the project and a desire to include as many of the proposed capability packages in the contract as possible. The ANAO understands ship repair and refit contracts normally allow a contingency of 30 per cent for emergent work.

### **Lesson to be learned**

**6.15** Given the high design and production risks associated with ship modifications that include repair and refit, there needs to be adequate provision for contingencies (for example, general contingency and emergent work).

**6.16** The Minister's media release in February 2000 noted one of the lessons to be learned from this project is the need for *'implementation of thorough risk analysis and appropriate risk abatement measures.'* The Under Secretary Defence Acquisition, in recent evidence to the Joint Committee of Public Accounts and Audit on Defence's management of major projects, stated that *'we are putting more effort up-front in trying to identify budgetary, schedule and other risks and technological risk for the given capability.'*<sup>58</sup> The ANAO considers that the project would have benefited had there been high-level risk assessment at key points during the project, with significant risks identified, appropriately treated and closely monitored. This kind of assessment should be undertaken by experienced project personnel.

### **Lesson to be learned**

**6.17** A high-level risk assessment needs to be undertaken by experienced personnel at key stages of the capability development process and any significant risks identified should be appropriately treated and closely monitored.

## **Overseas experience with ship acquisition/modification**

**6.18** A 1993 Project Office file (prior to the acquisition of the ships) contains a copy of a 1990 report by the UK House of Commons' Defence Committee on the purchase and modification by the Ministry of Defence (MoD) of a merchant ship for military purposes (see box below). Despite the similarities between the British and Australian ship acquisition/modification experiences, Defence did not anticipate and adequately address the risks involved with the acquisition and modification of the LPAs. The New Zealand Defence Force also acquired a second-hand ship in 1994 with the aim of modifying it for military sea-lift purposes. They too have encountered difficulties (see Appendix 6).

**6.19** It would have been preferable had Defence examined relevant experience overseas on the acquisition of second-hand ships for military purposes and incorporated those experiences into the capability development process for the LPAs. This would have assisted project management and enhanced the value-for-money gained from the project.

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<sup>58</sup> Joint Committee of Public Accounts and Audit, Review of Audit Report No.13 1999–2000 *Management of Major Equipment Acquisition Projects—Department of Defence*, Proof Hansard 16 May 2000, p. PA 34.

## Purchase and conversion of a merchant ship by the UK Ministry of Defence

Project Office files contain a copy of a 1990 report by the House of Commons' Defence Committee on the purchase and conversion of a merchant ship in 1984. The report<sup>59</sup> was forwarded from Defence's Naval Adviser in London to the Assistant Chief of Naval Staff (Materiel) in 1990. The covering minute to the report states that it provides 'a well documented example of the hazards of entering hurriedly into one-off but major acquisition contracts.'

In 1983 the UK Ministry of Defence (MoD) decided that a replacement was required for the aviation training ship *RFA Engadine*. A concept study undertaken found that the requirement could be met by a new build or by conversion of a large merchant vessel. In March 1984, following a 'swift' survey of the vessel, a 'firm price' contract was signed with Harland & Wolff for the purchase and conversion of the merchant ship *Contender Bezant*, at a cost of £49m. Work on the conversion began soon afterwards and a number of problems with the conversion were identified including: the requirement for substantial rectification work (including refurbishment of the main engines); the discovery of asbestos and lead-based paint which required removal; piping runs frequently deviated from the supplied drawings supplied; and additional work was required to be added to the contract (for example, communications enhancements and ship weapon package).

The ship was accepted into Royal Navy service in March 1988, 14 months later than the planned acceptance date. In 1988 Harland & Wolff submitted a claim for reimbursement of additional costs incurred for reasons the contractor considered to be the responsibility of the MoD. These reasons included delay and dislocation costs incurred by the company during performance of the contract; unforeseen deficiencies in the vessel; additional cost of alterations; and higher cost of provisionally priced items. The report indicates that the MoD reached a settlement figure of £22.5m with the contractor in 1990.

The UK Defence Committee was particularly concerned with the 'haste with which MoD proceeded from concept study to contract. MoD candidly acknowledged that this was wholly attributable to the desire to commit available funds before the end of the financial year 1983-84, which would otherwise have had to be surrendered to the Treasury.' The facility now exists for the MoD to carry over some unspent funds in one financial year to a subsequent financial year. The Defence Committee commented that this would 'help avoid this sort of wild rush to complete a deal.'

<sup>59</sup> House of Commons' Defence Committee, Second Report, Supplementary Estimate Class I, Vote 2: *Payment to Harland & Wolff PLC* (17 January 1990), London.

## Risks to completion of the project

**6.20** The audit team asked the Project Office, SCA(N) representatives and the Head of the LPA Delivery Team in April 2000 what they considered to be the main risks to completion of the project. All confirmed that the electrical upgrade was the main risk to the project, as it would establish the critical path for the delivery schedule. LPA Delivery Team Meeting minutes of 28 March 2000 state that good progress had been achieved in relation to the electrical upgrade work for *Kanimbla* but that the work package had not been included in the contract. In addition to the risk associated with the electrical upgrade, SCA(N) identified several other risks to *Kanimbla's* delivery by 28 September 2000 and advised that they are being monitored. The risks are summarised below:

- The impact of the Sydney Olympic Games on Forgacs' production activities—SCA(N) advised the ANAO that Forgacs' current schedule did not allow for the potential impact on production activities as a result of lower expected staff attendance over the Olympic period (as had been experienced over previous Christmas periods).
- Set-to-work (STW) defects—as machinery and equipment have lain idle for an extended period of time there is a risk that *Kanimbla's* schedule could be delayed by the discovery of defects during the STW period. These delays could be exacerbated by the fact that *Kanimbla* was used as a source of spare parts for *Manoora's* modification/refit.<sup>60</sup> Should replacement parts take time to acquire further pressure could be put placed upon *Kanimbla's* schedule. SCA(N) advised the ANAO that Forgacs has no particular incentive to expedite the supply of required spares. However, since many of *Kanimbla's* valves and motors have been overhauled, the number of STW defects may be less than that discovered during *Manoora's* STW phase.
- Possible electrical deficiencies—surveys of the electrical distribution system, sound-powered telephone cabling and internal communications circuits are still to be completed. These surveys may identify, as they did on *Manoora*, numerous electrical deficiencies.
- The impact of warranty and outstanding contracted work on *Manoora*—the completion of outstanding contracted work on *Manoora* during its July/August 2000 availability period<sup>61</sup> may affect Forgacs' ability to provide sufficient numbers of production staff to meet *Kanimbla's*

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<sup>60</sup> For example, at the time of audit, SCA(N) and the Project Office were attempting to locate a replacement turning gear for *Kanimbla* from the US Navy in an attempt to improve upon the cost and lead-times quoted by Forgacs.

<sup>61</sup> A post delivery availability is to occur during the period 3 July–11 August 2000.

current delivery date. This will depend upon the actual trades required at that time. Although Forgacs have stated that will be using contract labour to complete *Manoora*, SCA(N) noted that key Forgacs staff will still be required for this work (for example, supervisory staff and staff with specialist knowledge and skills). SCA(N) consider that the absence of these staff may affect *Kanimbla*'s set-to-work phase. The requirement to complete major warranty defects, should they arise, could have a similar effect.

- Delays in the provision of Government Furnished Equipment—SCA(N) advised the ANAO that Forgacs can be expected to claim that delays in the provision of GFE are responsible for overall schedule delays. SCA(N) assert that most GFE items would not impact upon the 'critical path' of the schedule and therefore are not the primary cause of the overall schedule delay.

## Conclusion

**6.21** There was no systematic risk assessment during the concept development or acquisition stages of the project. This resulted in significant risks not being identified or treated, increasing both the significance and likelihood of risks in later stages of the project. There is also evidence that Defence did not adequately consider overseas experience with second-hand ship acquisition/modification and a caution provided by the then Department of Finance in 1993 in regards to such purchases.

**6.22** Production and design risks were assessed just prior to the start of the contract. However, the ANAO found that some of these risks may not have been correctly assessed or adequately treated. There is also evidence that work pressures, especially in the early stages of the modification contract, adversely affected the ability of Project Office staff to monitor identified risks. Defence have identified several significant risks to the completion of the project within current cost and schedule constraints, and advised that these are being monitored.

## 7. Project Review and Lessons to be Learnt

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*This chapter discusses internal audit reports on the project and the lessons to be learnt from the project.*

### Audits by Management Audit Branch

**7.1** Management Audit Branch (MAB) in Defence's Inspector-General Division is Defence's internal audit branch. MAB completed two reports on the project (see paragraph 1.5). The first, in April 1998, focused on the acquisition of the ships. The second, in June 1999, focused on the modification/refit of the ships. The reports contain a number of recommendations and 'lessons to be learned'.

**7.2** The 1998 report raised several significant matters concerning the project (cost overruns; inadequate management processes; expenditure of unprogrammed funds that adversely affected other fleet assets; no life-cycle costing; problematic assessment of value-for-money; need for a second audit; etc). The 1999 report also raised significant matters (project problems unresolved; continuing cost increases and schedule slippage; serious process, procurement, organisational and management deficiencies; procurement of ancillary equipment very poorly managed; excessive optimism; inadequate risk management; possible need for further audit; etc).

**7.3** The 1998 report made several recommendations, but did not contain responses. Had the report have been acted upon there may have been a better project outcome. The 1999 report made three key recommendations to the Defence Acquisition Organisation (DAO), which disagreed with two of them. One of the disagreed recommendations was that '*a small team of Defence senior managers with the authority to make high-level decisions be formed and meet on a regular basis to resolve outstanding issues*'. DAO's response was that lines of authority were adequate and that the project management structure was supported by the Defence Acquisition Review Board (a DAO forum for monitoring major acquisition projects). In July 1999, however, the Chief of Navy (CN) found it necessary to establish the LPA Delivery Team to give better focus on achieving a satisfactory outcome from the project. The Minister's media release of 3 February 2000 stated that an important lesson to be learned from this project was the need for more active involvement by senior oversight committees.

7.4 The other disagreed recommendation sought to fill some key positions in the Project Office with out-posted SCA(N) staff to provide more efficient SCA(N) input and increase SCA(N) visibility over funding and expenditure requirements. DAO responded that current arrangements were adequate and appropriate. Despite DAO's response, SCA(N) in November 1999 considered it necessary to place a Navy representative in the PDR's Office in order to '*scrutinise every request for SCA(N) funding*' and ensure that '*non-essential growth does not occur.*' The ANAO considers that events subsequent to MAB's 1999 report have shown that the disagreed recommendations had merit and should have been better considered.

### *Review of MAB reports*

7.5 Finance Minister's Orders made under the *Financial Management and Accountability Act 1997* require each Commonwealth agency's audit committee to review audit reports involving matters of concern to senior management and to provide advice to the Chief Executive on action to be taken on matters of concern in such reports. The two MAB reports on the Project were not, however, reviewed by Defence's audit committee (the Defence Audit and Program Evaluation Committee (DAPEC)). In August 1998, after it was found that the project was in need of sustained higher-level management attention, the preliminary findings of MAB's second report were discussed with key project stakeholders. The Inspector General advised the ANAO that copies of the 1999 report were provided to the Secretary, the Chief of Defence Force and the Chief of Navy and their attention was drawn to the audit's key findings and recommendations. An information copy was also sent to the Deputy Secretary Resources and Management, who was the Chairperson of DAPEC at that time. As a result of the problems identified by the audit, Chief of Navy established the LPA Delivery Team in July 1999.

7.6 The Inspector General's advice seems to indicate that the MAB reports involved matters of concern to senior management and that DAPEC should have reviewed them and advised the Chief Executive (the Secretary of the Department of Defence) if appropriate action was not being taken. This would have been consistent with the Finance Minister's Orders and good corporate governance. Had such actions been taken, they may have resulted in earlier high-level intervention in this project. The lack of review by the audit committee underlines the Minister's 'lesson' regarding the need for more active involvement by senior oversight committees. Defence's response to a recent ANAO report on MAB indicates that DAPEC will be taking a more active interest in audit matters in future.<sup>62</sup>

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<sup>62</sup> Audit Report No.50 1999–2000 *Management Audit Branch—Follow-up, DoD* (June 2000)

## Conclusion

7.7 Two internal audit reports on the project, in 1998 and 1999, raised significant issues of concern. It would have been in Defence's interest had closer consideration been given to the reports and their recommendations. It would be generally expected that both reports would be reviewed by Defence's audit committee. Where appropriate action was not being taken in relation to the issues of concern, the Chief Executive could expect to be informed.

## Lessons to be learned

7.8 As part of its audits of the project, MAB identified a number of lessons to be learned from the project.<sup>63</sup> The Minister's media release on the project also identified a number of important lessons to be learned (see Appendix 1 of this report). The ANAO's review of Project Office files did not indicate that the lessons identified by either the MAB reports or the Minister had been formalised and disseminated widely in Defence.

7.9 As indicated throughout this report, the ANAO also identified a number of lessons to be learned from the project, which are consistent with those already identified. The ANAO considers that these lessons, as well as those identified by the Management Audit Branch and the Minister be formalised into guidance and disseminated widely in Defence to assist in future acquisition projects.

7.10 In its response to the proposed report of the audit (August 2000), Defence stated that:

*Lessons learnt have been actioned by the Department. The Defence Materiel Organisation's (DMO's) Lessons Learnt database contains lessons, derived from the Amphibious Transport Ship Project, on: 'Higher Risks for Second Hand Platforms; Project Management Arrangements of Future Ship Modifications and Refits; and Provision of Government Furnished Equipment (GFE)'.*

7.11 The ANAO notes that DMO's lessons learnt database is available to members of the DMO through Lotus Notes but the lessons to be learnt from this project have wider application in Defence. For example, many of the problems with this project originated during the capability development stage, before the acquisition stage.

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<sup>63</sup> See pp. 17–20 of Inspector General's report to the Minister for Defence on *Project JP 2027—Amphibious Transport Ships (LPAs)*, 16 December 1999 (<http://www.minister.defence.gov.au/2000/lpaig.htm>).

## Recommendation No.5

7.12 The ANAO *recommends* that the lessons to be learned identified by the Management Audit Branch, the Minister and the ANAO from this project be formalised into guidance and disseminated widely in Defence to assist future acquisition projects.

### *Defence response*

7.13 Agreed.

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A handwritten signature in black ink, appearing to read 'P. J. Barrett', is positioned above the printed name and title.

Canberra, ACT  
7 September 2000

P. J. Barrett  
Auditor-General



# **Appendices**

## Appendix 1

### Minister's media release

MEDIA RELEASE

THE HON. JOHN MOORE MP

Minister for Defence

Thursday, 3 February 2000 MIN003/00

### Reports on Amphibious Transport Ships

The Minister for Defence, John Moore, today released two reports on the Navy's Amphibious Transport (LPA) project.

*"Shortly after becoming Minister for Defence, I was made aware of significant increases in cost and completion delays for HMAS Manoora and HMAS Kanimbla," Mr Moore said.*

*"I considered these overruns to be totally unsatisfactory, and in August last year, I directed the incoming Chief of Navy, Vice Admiral David Shackleton, to provide me a full report on the project.*

*"I also asked the Inspector General of Defence to review the acquisition of the ships and Defence's management of their conversion and modification.*

*"I have now received these reports and both indicate the process of acquiring and upgrading these vessels fell well short of performance levels expected by the Government," Mr Moore said.*

In mid-1994, the previous Australian Government approved the purchase of two ex-United States Navy Newport Class amphibious landing ships. HMAS *Manoora* and HMAS *Kanimbla* arrived in Australia later that year, and since mid-1996 have been undergoing extensive modifications to upgrade them to Amphibious Transport Ships (known as LPAs).

The initial project cost was to be \$120 million at December 1998 prices. Present planning indicates that when the project is completed in late 2000, the final cost could exceed \$400 million.

In addition to this three-fold increase in cost, there was a delivery delay of 26 months for the first ship, HMAS *Manoora*, from the time of contract, and 35 months for *Kanimbla*.

*"As Defence Minister, I find these delays and cost overruns totally unacceptable, and I am determined to see Defence management practices improve, particularly in Defence Acquisition," Mr Moore said.*

*"I have instructed the Secretary, Dr Allan Hawke, and the Under Secretary, Mr Mick Roche, to recommend to me improvements in the management of the*

*Department to ensure the experience of the LPA purchase is not repeated in current and future acquisition projects. The entire Department should learn from this unfortunate, costly experience."*

*"I also have asked Mr Roche to provide me with an urgent status report on the 15 major projects currently being undertaken by Defence."*

*"Overall, there are important lessons to be learned for Defence from the handling of this project."* They include the need for:

- \* properly conducted pre-procurement inspections, particularly of second-hand materiel;
- \* implementation of thorough risk assessment and appropriate risk abatement measures;
- \* full life cycle costing of equipment purchases;
- \* clearly defined operational requirements for the equipment before it is purchased;
- \* dedicated, competent project teams with full access and authority over expenditure of the project's funds; and
- \* more active involvement by senior oversight committees.

An LPA Delivery Team has been formed to bring this project to a timely conclusion. Operational sea trials with *Manoora* have commenced.

When the project is finalised, the *Manoora* and *Kanimbla* will provide the Australian Defence Force with significantly enhanced amphibious transport capability over planned service lives of 15 years. It is expected that this capability will be delivered by late this year.

*"Notwithstanding the difficulties presented from the outset of this project, the Government is committed to ensuring that Manoora and Kanimbla contribute to an efficient and effective amphibious capability, as soon as possible,"* Mr Moore said.

*"With four helicopters and two landing craft per ship, Manoora and Kanimbla can each transport 450 troops with vehicles and equipment, and lodge and sustain them ashore. Both ships have a hospital and, importantly, can be used for disaster relief or the evacuation of Australian nationals abroad,"* Mr Moore said. *"They would have been great assets in East Timor."*

Copies of the report are available on the internet at the Defence website:

<http://www.minister.defence.gov.au/2000/index.html>. An LPA fact sheet is attached and broadcast standard vision is available from Defence Public Affairs.

For more information contact Commodore Tim Cox on 0419 204449.

Phone: 61 (02) 62777800 Fax: 62734118 Media Inquiries: 0419 982482

Email: J.Moore.MP@aph.gov.au Website: [www.defence.gov.au](http://www.defence.gov.au)

## AMPHIBIOUS TRANSPORTS (LPA)—FACT SHEET

HMAS *Kanimbla* L51 (ex USS *Saginaw*)

HMAS *Manoora* L52 (ex USS *Fairfax County*)

Launched in 1970

Commissioned into USN in 1971

Recommissioned into RAN in 1994

Displacement

8450 tons full load

Dimensions

Length 160 m; Breadth 21 m; Draft 5.3 m

Machinery

6 ALCO Diesel Engines (16,500 hp); 4 Generators; 2 Shafts; Bow Thruster

Speed: 20 + kts

Range: 14000 nm @ 15kts

Complement: 200 crew (including 20 Army)

Military Lift: 450 troops

### Capability

- \* Hanger for 4 Army Black Hawk or 3 Navy Sea King helicopters
- \* 3 helicopter operating spots—2 spots on the aft deck and 1 forward
- \* 2 Army LCM8 Landing Craft
- \* 70 tonne crane
- \* Medical facility
- \* Extensive Command and Control facilities
- \* 250 tonnes aviation fuel

In combination the LPAs will provide the ADF with a capability to embark, deploy, lodge and sustain an Army Battalion Group. Specifically the LPAs will be able to:

- conduct an amphibious lodgement by a combination of helicopters and watercraft;
- transport a tactically embarked Battalion Group to a range of 6000km and remain on station for 14 days and conduct a Services Protected Evacuation;

- conduct logistics support over the shore for the lodgement and sustainment of land forces without reliance of local infrastructure;
- conduct at sea training for RAN officers and sailors;
- provide facilities at sea for the command and control needs of the Amphibious Group Commander and Commander of the Landing Force;
- provide a seaborne medical facility capable of conducting initial wound surgery and post operative intensive care; and
- provide fuels and potable water for a force operating ashore provide a disaster relief operating base capable of operating throughout the region.

## Appendix 2

### Acquisition cost of the ships

<i>Funded items</i>	<i>\$m (December 1995 prices)</i>
Purchase price of <i>Manoora</i> and <i>Kanimbla</i>	23.740
Transfer costs	6.772
Equipment	0.721
Personnel	2.204
Supply support/Spares	12.206
Logistics	6.638
Modifications and project costs in Australia	8.791
<b>Total</b>	<b>61.072</b>

Source: Project Office records.

### Appendix 3

## Funding to allow Army to operate with the LPAs

<i><b>Funded Items</b></i>	<i><b>Approved Funding \$m</b></i>
1. Land Craft Mechanised Mk8 (LCM8) compatibility—modification to make them suitable for LPA's and some habitability upgrades.	3.517
2. Lighter Amphibious Resupply Cargo Mk V (LARC V)—involves returning nine 'ducks' to operational service, communications suite installation and engine upgrade.	1.500
3. Information system for cargo planning and discharge.	0.286
4. C3IS Government Furnished Equipment for LPA.	2.150
5. C3IS Facility for HMAS <i>Kanimbla</i> —initially fitted for but not with but later considered inefficient.	1.233
6. Development of standard operating procedures for LPA/Army Operations.	0.276
7. Raising and equipping the Ship's Army Detachment (SAD) for both ships (includes 7 fork-lifts, two per LPA and TOBRUK plus one for training).	1.052
8. Army responsibilities for LPA Test and Evaluation.	1.040
9. Specialist training and doctrine.	0.175
10. Naval lighterage equipment.	3.978
<b>Total</b>	<b>15.207</b>

Source: Army records.

\* On each ship, the SAD is provided with 20 bunks (includes OIC, 2IC, supervisor terminal (WO), 12 terminal operators (responsible for loading and unloading of ships via cranes and fork-lifts), 3 aircraft handlers (with skills in tying down and moving aircraft), 2 signallers (IT experts) to operate Army's C3 installation). Watercraft and their staff will be embarked when required. A total of 11 personnel is required to manage two watercraft.

## Appendix 4

### Phase 2A approved funding—aviation aspects

Funded items	Planned Expenditure \$m
Support Command Australia (Air Force)—Army Aviation Logistic Management Squadron—for Black Hawk helicopter support.	1.100
Aviation Research and Development Unit (ARDU)—for instrumentation of a Black Hawk helicopter for first-of-class flight trials.	0.280
Defence Facilities—for flight deck procedural trainer at RAAF Townsville.	3.300
Naval Aviation Logistic Management Squadron—to provide one additional operating base for three Sea King helicopters and ballistic matting protection for aircrew in Sea Kings (seven sets).	10.240
Contingency	5.080
Total Phase 2A expenditure	20.000

Source: Defence records.

## Appendix 5

### Repair and refit funding to complete the project

<b><i>Funded items</i></b>	<b><i>\$m</i></b>
Contract / Engineering Change Proposals	7.6
Emergent Work Change Proposals previously identified	4.6
Emergent Work Change Proposal Contingency—not previously identified (1)	4.3
Estimated new work—Electrical	2.4
Estimated new work—Hull	2.7
Estimated new work—Motor Transport	1.1
Estimated new work—Safety of Life at Sea (SOLAS)	3.8
Estimated new work—Outfit allowance list (2)	1.6
New issues (3)	6.9
<b>Total</b>	<b>35.0</b>

Source: Support Command Australia (Navy) records.

Notes:

1. Includes 20 per cent contingency for known additional work and \$0.5 million to rectify cannibalisation of *Kanimbla* equipment.
2. Includes both medical and aviation outfit allowance list.
3. Includes \$1.5 million for *Kanimbla* Post Shakedown Availability (Funded Assisted Maintenance Period (PSA-FAMP) 2000–01) and \$5 million for PSA-FAMP 1999–00.

## Appendix 6

### New Zealand's purchase of a ship for military purposes

The New Zealand Defence Force acquired a second-hand ship in 1994 for military sealift purposes. The quality of advice provided to the Government in respect of the disjunction between the initial purchase of the ship and the subsequent decision to defer the conversion of the vessel was examined by the New Zealand Audit Office at the request of a parliamentary committee. The following summary is based on the audit report.<sup>64</sup>

The 1991 White Paper Defence of New Zealand 1991 recommended, *inter alia*, that the NZ Defence Force obtain a military sealift ship based on a commercial medium-size roll-on/roll-off ship as a matter of priority. In 1994, when the Government approved the purchase of a military sealift ship (MSS), it was advised that the purchase and initial modification would give NZDF an adequate basic capability regardless of whether it was fully modified and that the NZDF had the ability to fund the purchase and full modification without capital injection.

A second-hand roll-on/roll-off cargo ship was purchased in December 1994 for \$NZ14 million. It was commissioned as HMNZS *Charles Upham* in October 1995 after initial modifications costing an estimated \$NZ8 million to return the ship into class (according to Lloyds rules) and to fit naval communications equipment.

Still basically in its roll-on/roll-off configuration, the ship began sea trials, but difficulties became apparent. With the light loads required by Army for routine sea transport (500 to 1300 tonnes), the ship rode high in the water, causing it to roll readily and extremely quickly in certain sea conditions. It had been designed for heavy commercial cargo loads of up to 7000 tonnes, with a minimum cargo load, as stated by the NZDF, of 3500 tonnes for stability and safety at sea.

The ship's main propulsion system proved to be unreliable during the sea trial. When the main engine was shut down at sea, the absence of power and the ship's shallow draft caused the ship to roll, sometimes alarmingly. The ship's roll rate, although just acceptable when the ship was making way, was thus exacerbated by the machinery breakdowns.

The ship was temporarily withdrawn from service in order to improve its stability and the reliability of the propulsion system. Remedial work

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<sup>64</sup> Office of The Controller and Auditor-General 'HMNZS *Charles Upham*: Report on Concerns Raised by the Foreign Affairs, Defence and Trade Committee' 24 September 1998.

was done to the main engine control system and starting system. By July 1997 most of the issues raised with the ship's machinery reliability were said to have been rectified, but the sea trials were not reactivated.

In March 1996 Defence funding problems were reported and a Defence Assessment (which took 18 months) was undertaken. During this period only purchases for approved capital items was allowed. Modification of the ship was not an approved project. One of the outcomes of the Defence Assessment was that the modification was given lower priority than upgrading the Army's combat capability and the capabilities of the Orion maritime surveillance aircraft.

In 1997 it was decided to defer the modifications to the ship for two years and during this period the ship was to be leased. In 1998, to defer capital charge and to offset depreciation expense, it was leased to a Spanish company for two years expiring in August 2000. The lease has been extended for a further year.

Despite the expenditure of \$NZ22 million (purchase and initial modification), the NZDF still lacked the basic MSS capability sought in 1994. At the time of audit in 1998, the NZDF was preparing a submission to Cabinet for approval in principle to spend \$NZ25 million for the conversion of the ship and approval to spend \$NZ3 million of that sum to enable design work and tender phase to be completed. At June 2000, the NZ Government was still to consider the ship's future.

## Appendix 7

### Summary of project schedule slippage

<b>Stage of Contract dates</b>	<b>Original Planned contract</b>	<b>Dates at award of</b>	<b>Dates post real increase</b>	<b>Dates as at June 1999</b>	<b>Current Planning</b>
Phase 2 Approval	June 1994				
Contract signature	Aug 1995	May 1996			
Delivery of ships to Forgacs	Aug 1995	May 1996			
Acceptance from Forgacs: <i>Manoora</i> <i>Kanimbla</i>	July 1996 June 1996	Sep 1997 Sep1997	Jan 1999 May 1999	Aug 1999 Feb 2000	Nov 1999 Sept 2000
Ships enter service: <i>Manoora</i> <i>Kanimbla</i>	Feb 1997 Jan 1997	Oct 1997 Oct 1997	Jul 1999 Jul 2000	Nov 1999 May 2000	Nov 1999 Oct 2000

Source: Defence records.

A June 1999 Status Report<sup>65</sup> on the project for the Minister identified the following reasons for the slippage in the project schedule:

- A decision to install Land Craft Medium 8's (LCM8s) and a seventy tonne crane on *Kanimbla* (which was not planned under the original proposal) resulted in a delay to the delivery date to September 1997 for both ships.
- The discovery and removal of more asbestos than anticipated required additional work by Forgacs. There were also a number of increases in the scope of work including the upgrade of the main galley, cafeteria and sculleries and removal of steam equipment (approved in November 1996).
- In January 1997 engine cracking resulted in a requirement for three new main propulsion diesel engines and a fourth ship's service diesel generator for each ship. This, together with a large increase in the amount of refit emergent work, resulted in a slippage of the planned delivery date to January 1998.
- In March 1997 duplication of the communications upgrade for *Kanimbla*

<sup>65</sup> Head of Systems Acquisition (Maritime and Ground) Status Report on JP2027 -Amphibious Transport (22 June 1999).

was approved as well as a major communications upgrade for both ships.

- In December 1997 an increase of \$36 million in DAO funding was sought and approved by Government to allow for further increases to the scope of work.<sup>66</sup> Forgacs was then required to scope and cost this extra work before Defence could approve it. Design work was then required. All this had a serious impact on Forgacs' ability to begin production work. During 1998 this work was progressively costed and agreed. As the production work progressed, significant emergent work arose as equipment and systems were opened up in the course of modification work. This increase in the scope of work caused a further delay in the delivery of HMAS *Manoora* to January 1999.
- Navy identified the slippage in *Manoora's* delivery date to November 1999 as being attributable to the continued discovery of emergent work, Navy certification and OH&S requirements, incorporation of lessons to be learned from the HMAS *Westralia* incident,<sup>67</sup> electrical validation, and Navy funding difficulties.
- During 1999 the Project Office instructed Forgacs to give priority to production activities on *Manoora*. The impact of this refocussing of resources has been delay in the delivery of *Kanimbla* until 28 September 2000.

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<sup>66</sup> These included habitability upgrades (embarked forces accommodation upgrade, solid waste disposal system, wardroom/ petty officer pantries and messes and compartment modifications), facilities to embark helicopters, fendering for the LCM8's, fire fighting upgrade and the addition of a medical facility on HMAS *Kanimbla*.

<sup>67</sup> The ANAO understands that an engineering certification of the LPAs was undertaken in response to recommendations from the *Westralia* Board of Inquiry.

## Appendix 8

### Performance audits in Defence

*Set out below are the titles of the ANAO's previous performance audit reports on the Department of Defence and the Australian Defence Force (ADF) tabled in the Parliament in the last five years.*

Audit Report No.8 1995–96 <i>Explosive Ordnance (follow-up audit)</i>	Audit Report No.2 1998–99 <i>Commercial Support Program</i>
Audit Report No.11 1995–96 <i>Management Audit</i>	Audit Report No.17 1998–99 <i>Acquisition of Aerospace Simulators</i>
Audit Report No.17 1995–96 <i>Management of ADF Preparedness</i>	Audit Report No.41 1998–99 <i>General Service Vehicle Fleet</i>
Audit Report No.26 1995–96 <i>Defence Export Facilitation and Control</i>	Audit Report No.44 1998–99 <i>Naval Aviation Force</i>
Audit Report No.28 1995–96 <i>Jindalee Operational Radar Network Project [JORN]</i>	Audit Report No.46 1998–99 <i>Redress of Grievances in the ADF</i>
Audit Report No.31 1995–96 <i>Environmental Management of Commonwealth Land</i>	Audit Report No.13 1999–00 <i>Management of Major Equipment Acquisition Projects</i>
Audit Report No.15 1996–97 <i>Food Provisioning in the ADF</i>	Audit Report No.26 1999–00 <i>Army Individual Readiness Notice</i>
Audit Report No.17 1996–97 <i>Workforce Planning in the ADF</i>	Audit Report No.35 1999–00 <i>Retention of Military Personnel</i>
Audit Report No.27 1996–97 <i>Army Presence in the North</i>	Audit Report No.37 1999–00 <i>Defence Estate Project Delivery</i>
Audit Report No.34 1996–97 <i>ADF Health Services</i>	Audit Report No.40 1999–00 <i>Tactical Fighter Operations</i>
Audit Report No.5 1997–98 <i>Performance Management of Defence Inventory</i>	Audit Report No.41 1999–00 <i>Commonwealth Emergency Management Arrangements</i>
Audit Report No.34 1997–98 <i>New Submarine Project</i>	Audit Report No.50 1999–00 <i>Management Audit Branch—Follow-up</i>
Audit Report No.43 1997–98 <i>Life-cycle Costing in Defence</i>	Audit Report No.3 2000–01 <i>Environmental Management of Commonwealth Land—follow-up</i>

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