Australian National
Audit Office

Auditor-General Report No.6 2018–19

Army's Protected Mobility Vehicle–Light

Confidential report issued under paragraph 37(5)(b) of the *Auditor-General Act 1997*

This report has been prepared pursuant to paragraph 37(5)(b) of the *Auditor General Act 1997* (Cth) (the Act). The report contains particular information that the Auditor-General is required to omit from the public report (Auditor-General Report No.6 2018–19 *Army's Protected Mobility Vehicle–Light*) under a certificate issued by the Attorney-General pursuant to paragraph 37(1)(b) of the Act that, in his opinion, the disclosure of the information would:

- prejudice the security, defence or international relations of the Commonwealth (paragraph 37(2)(a) of the Act); and/or
- unfairly prejudice the commercial interests of any body or person (paragraph 37(2)(e) of the Act).

This report highlights in orange the particular information that is subject to the Attorney General's certificate, and which is omitted from the public report.

Canberra ACT
6 September 2018

Grant Hehir
Auditor-General

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Background

1. The Protected Mobility Vehicle–Light project aims to provide the Australian Defence Force with highly mobile field vehicles that are protected from ballistic and blast threats. The Department of Defence (Defence) commenced the acquisition process in 2006, and in 2008 adopted a strategy to procure the Joint Light Tactical Vehicle (JLTV) being developed by the United States. The vehicle ultimately selected in 2015 was the Australian-developed Hawkei vehicle designed by Thales Australia (Thales).

2. In October 2015, Defence entered into a contract with Thales to acquire and support 1100 Hawkei vehicles and 1058 trailers. Total budget and related funding for the Protected Mobility Vehicle–Light capability, as estimated by the ANAO, is $2.2 billion.[1] Defence has expended $463.1 million of project funds to 30 June 2018, as well as $293.9 million on related costs. The first Low-Rate Initial Production vehicles were scheduled for delivery in February 2018.

Rationale for undertaking the audit

3. This project was selected for audit because of the materiality of the procurement, the adoption of a sole-source procurement strategy, the time taken to select a vehicle, and the risk involved in manufacturing a relatively small run of vehicles when the United States was beginning a similar but much larger program.

Audit objective and criteria

4. The objective of the audit was to assess the effectiveness and value for money of Defence's acquisition of light protected vehicles, under Defence project Land 121 Phase 4. To form a conclusion against the audit objective, the ANAO adopted the following high-level criteria:

- Defence conducted an effective procurement process that achieved value for money.
- Defence has established effective project governance and contracting arrangements.

Audit methodology

5. The audit method involved:

- fieldwork at Defence's Land Systems Division in Melbourne, Defence's vehicle testing facility at Monegeetta (Victoria), Defence's explosives testing facility at Graytown (Victoria), the Thales facility in Bendigo (Victoria) and the Thales computing laboratory in Rydalmere (New South Wales);
- analysis of information from Defence systems covering the period 2006–18; and
- interviews with Defence project personnel and contractors.

1 Comprising approved project funding of $1.9 billion and related costs of $293.9 million. Defence's acquisition contract with Thales is for $1328.5 million. See Table 1.1.

Attorney-General's certificate

6. This confidential performance audit report is provided to the Prime Minister and Ministers pursuant to paragraph 37(5)(b) of the *Auditor-General Act 1997* (the Act). The report contains information that must be omitted from the Auditor-General's public report to Parliament.

7. Information has been omitted from the report to Parliament following a decision by the Attorney-General, under paragraph 37(1)(b) of the Act, that in his opinion the disclosure of certain information would be contrary to the public interest for one or both of the reasons set out in paragraphs 37(2)(a) and 37(2)(e) of the Act. The Attorney-General issued a certificate to this effect on 28 June 2018. The Auditor-General received the certificate on 29 June 2018.

8. A copy of the Attorney-General's certificate is included as Appendix 5 to this audit report. Information required to be omitted by virtue of the certificate has been highlighted in the report. If the Auditor-General must omit information from a public report because a certificate has been issued under paragraph 37(1)(b), the Auditor-General may prepare a report under paragraph 37(5)(b) that includes the information concerned, and must give it to the Prime Minister, the Minister for Finance and any responsible Minister, in this case the Ministers for Defence and Defence Industry.[2] The Auditor-General will also present a report to Parliament which omits the particular information required by the Attorney-General's certificate. In accordance with the ANAO Auditing Standards, the Auditor-General's public report will contain a disclaimer of the audit conclusion. The basis for the disclaimer of conclusion is set out in the public report.

9. Defence's procurement of Hawkei vehicles has continued during the Attorney-General's considerations regarding a certificate, and the ANAO's performance audit engagement has also continued in accordance with the ANAO Auditing Standards. This report has been updated to reflect material events in the procurement until July 2018.

Conclusion

10. Defence has invested significant effort into developing a capable light protected vehicle, including through an extensive test and evaluation program, and is procuring a design (Hawkei) that meets the majority of the requirements. Defence has not clearly demonstrated that the acquisition provides value for money, as it did not undertake robust benchmarking in the context of a sole-source procurement. Defence has established appropriate arrangements for project governance, but has accepted additional risk by entering Low-Rate Initial Production while reliability issues are still being remediated.

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11. Defence developed six fundamental requirements for the Protected Mobility Vehicle–Light by 2009, and these have remained relatively stable. The Hawkei is a developmental vehicle, and Defence has conducted a large amount of test and evaluation covering its technical performance and useability.

12. At First Pass in 2008, a financial partnership with the United States in its JLTV Program was adopted as the primary acquisition strategy, at a cost of $43 million. In 2009, Defence sought approval to commence a parallel investment in Australian-based options that it had previously decided to be high-risk and high-cost. At Interim Pass in December 2011, Defence recommended

2 The text of section 37 of the *Auditor-General Act 1997* is included as Appendix 6 to this audit report.

and received approval for further development of the Thales Hawkei, because Defence considered it had the best prospect of meeting future needs, despite assessing it as the least developed Australian option. At the same time, Australia's financial partnership in the JLTV Program was discontinued amidst uncertainty as to the program's future, but it was retained as a possible alternative option for Second Pass. Within days of the Interim Pass decision, the United States decided to continue the JLTV Program. Defence did not reconsider its Interim Pass recommendations in the light of this significant change. The 2011 decision to discontinue Australian financial participation in the JLTV Program eroded Defence's ability to benchmark its procurement of the Hawkei against a comparable vehicle. In the absence of reliable benchmark information, there was a reduction in Defence's ability to evaluate whether procurement of the Hawkei clearly represented value for money.

13. Defence did not provide robust benchmarking of the Hawkei and Joint Light Tactical Vehicle options to the Government at Second Pass, to inform the Government's decision in the context of a sole-source procurement. At Second Pass, Defence advised the Government that the Hawkei would be approximately 23 per cent more expensive to acquire than the Joint Light Tactical Vehicle but would also be more capable. Without robust benchmarking of cost and capability, Defence was also unable to apply competitive pressure in its negotiations with Thales. Defence did not inform the Minister appropriately when material circumstances changed immediately after Second Pass and before contract signature. Publicly available information suggests that the (non-audited) per-unit price difference between the Hawkei and the Joint Light Tactical Vehicle exceeds the price difference advised to the Government at Second Pass.

Omission of highlighted text from public report required by certificate of the Attorney-General.

14. Defence has established appropriate oversight arrangements for the project. However, Defence postponed the May 2017 Gate Review, with the result that the project passed the major milestone of entry into Low-Rate Initial Production without the scrutiny offered by these reviews. Test and evaluation activity remains ongoing, as Defence entered Low-Rate Initial Production without retiring risk to the extent that it had planned. Defence has amended its contract with Thales to manage the related delays and cost increases. The project remains within the government-approved and contracted budget and scope, but reliability issues have led to schedule delays.

Supporting findings

Initial requirements and testing

15. Defence recognised early that its initial required number of vehicles (Basis of Provisioning) was unaffordable within the budget that it had been allocated, and its advice to Government consistently made this point. In 2008, Defence advised the Government that it required 1300 protected vehicles and associated trailers. In 2015, the acquisition contract provided for 900 fully protected and 200 baseline (less protected) vehicles and 1058 trailers.

16. Defence did not complete a fully developed Function and Performance Specification until July 2010, after the Request for Proposal for an Australian-manufactured option was released in June 2009. The six fundamental requirements (survivability, mobility, payload, advanced communications, useability and sustainability) have remained relatively stable during the remainder of the project, and the detailed requirements underpinning them have been refined

through developmental test and evaluation. Some requirements, such as weight and reliability, have been amended in the course of development. Defence decided in 2017 to remove the exportable power requirement, which had a contracted value of $30 million. As at July 2018, Defence was considering the return of funds from Thales following removal of that requirement.

17. Readiness for an advanced communications and control system is one of the six fundamental requirements. Defence did not have a detailed specification for this aspect of the vehicle until September 2014, and two rounds of requirements definition were conducted in 2016.

18. To manage the risk of this developmental project, Defence conducted a two-stage test and evaluation program of the Land 121 Phase 4 vehicle options between 2011 and 2013, including: user tests; landmine blasts; side blasts; ballistics testing; and air transportability testing. This program has contributed to Defence procuring a design (Hawkei) that meets the majority of its requirements.

19. By late 2013, the Hawkei design still represented a high risk. Defence amended some requirements as a result of the findings of the test and evaluation program, and conducted an additional Risk Reduction Activity during 2014, reducing the design risk to medium. Defence did not expect to achieve a stable design before signing the acquisition contract in late 2015.

The procurement process (First Pass and development contracts)

20. At First Pass in 2008, Defence adopted what it considered the least risky option of partnership in the United States JLTV Program, at a cost of $43 million, while also retaining the option of a military-off-the-shelf option. After extensive industry lobbying, Defence sought approval to commence a parallel investment in Australian-based options that it had previously decided to be high-risk and high-cost and had not presented for government consideration at First Pass.

21. Between July and November 2011, Defence received strong indications and advice from the United States Government that the JLTV Program was likely to experience lengthy delays, and possibly be cancelled. In November 2011, the Defence Minister directed that no further Australian investment in the program be made without his approval.

22. At Interim Pass in December 2011, Defence recommended, and received approval for, the Thales Hawkei as the primary Australian acquisition option following the Stage 1 test and evaluation process conducted during 2010–11. Defence considered that this design had the best prospect of meeting future needs, although it was the least developed Australian vehicle design. Defence noted that all three Australian options it had tested exceeded the project's budget. Defence did not make the Government aware of the results of an economic study it commissioned that found there would be limited regional economic benefits from, and a substantial premium paid for, the Hawkei build.

23. Defence records indicate that a significant driver of the Hawkei project schedule was the retention of production capacity at Bendigo after Bushmaster production ceased in late 2016. Defence recommended further production of Bushmasters at Bendigo to keep the facility in operation pending possible Hawkei approval. This was funded at a cost of $221.3 million, representing more than a ten per cent increase to Defence's expenditure related to acquiring the Hawkei capability. This expenditure was not taken into account in assessing the overall cost and value for money of the Hawkei project at Second Pass.

24. Defence did not reconsider its Interim Pass recommendations after new and potentially material information became available regarding the JLTV Program soon after Interim Pass governmental approval, and did not seek ministerial approval to continue Australian participation in the JLTV Program. The decision not to seek ministerial approval to continue in the JLTV Program reduced Defence's ability to benchmark its procurement of the Hawkei and apply competitive pressure, and together with the decision not to factor-in related expenditure, reduced Defence's ability to evaluate whether procurement of the Hawkei clearly represented value for money.

The procurement process (sole-source tender and Second Pass acquisition decision)

25. Defence decided to release a sole-source Request for Tender for the Hawkei in 2014. In this context, Defence usefully sought benchmarking analysis from a consultancy in 2014. The benchmarking analysis had to rely on 2011 open-source information for the Joint Light Tactical Vehicle for both price and capability (as Defence was no longer a partner in the JLTV Program). The analysis also compared the Joint Light Tactical Vehicle's 2011 compliance with requirements with the Hawkei's expected 2023 compliance with requirements.

26. Defence's assumptions as to government support for ongoing vehicle production at Thales' Bendigo facility and workforce continuity at the facility led Defence to maintain its schedule to Second Pass, rather than seeking consideration of a delay to obtain reliable benchmarking data.

27. Although the Government decided in 2011 that the Joint Light Tactical Vehicle would be the alternative option to the Hawkei, Defence's comparison of this vehicle with the Hawkei at Second Pass in August 2015 was not based on up-to-date information. As discussed above, Defence's consultancy advice provided to the Government at Second Pass—that the Hawkei would be 23 per cent more expensive to acquire than the Joint Light Tactical Vehicle, but would be a more capable vehicle—relied on 2011 open-source data for the Joint Light Tactical Vehicle for both price and capability.

28. Defence did not advise the Minister of the full implications of new and potentially material information—which included cost information—when the Joint Light Tactical Vehicle manufacturer was selected by the United States one week after Second Pass. Defence did not subsequently use the information available after the Joint Light Tactical Vehicle announcement to strengthen its negotiating position. Defence records indicate that Thales refused to negotiate anything of significance after it knew that the Australian Government had approved the acquisition of Hawkei vehicles. Defence advised the Minister that negotiations had been successfully concluded. The final negotiation report, completed one day after this advice to the Minister, drew to Defence's attention significant shortcomings in the negotiation strategy and outcomes.

29. In the absence of robust Defence benchmarking of the JLTV Program—to inform its management of the Thales Hawkei contract, maintain competitive pressure and inform its advice to the Government as to whether the accepted price difference of 23 per cent remained—the ANAO has used publicly available data to provide a (non-audited) per-unit cost-comparison of the vehicles. Although only one element of assessing overall value for money, this 'rolled-up' cost-comparison indicates that the per-unit cost of the Hawkei exceeds the 23 per cent price difference with the Joint Light Tactical Vehicle that was advised to Government in 2015. Defence advised the ANAO in December 2017 that a number of non-financial benefits of the Hawkei capability contributed to the overall value-for-money

Omission of highlighted text from public report required by certificate of the Attorney-General.

proposition of the Hawkei, including: the leading-edge protected vehicle and the Integral Computing System; the ability to adapt the capability to meet emerging threats; and the Commonwealth's Intellectual Property rights and potential royalties. These issues were mentioned in the 2015 Second Pass advice to Government, which supported the Hawkei acquisition and outlined the 23 per cent price difference of the Hawkei over the Joint Light Tactical Vehicle.

Governance and contracting arrangements

30. Defence has established appropriate oversight arrangements for the project. Senior leadership is updated on a monthly basis about key project issues. Regular contract progress meetings are held between senior project staff from Defence and Thales. The minutes of the meetings show a detailed presentation of information from Thales, ranging across the breadth of the project, and probing questioning from Defence that shows active management.

31. The 2016 Gate Review of the project raised concerns about the major challenges facing the project office and the risk of major failure by the contractor. The Gate Review scheduled for May 2017 was postponed until October 2017. This decision meant that the project passed the major milestone of entry into Low-Rate Initial Production without the scrutiny offered by these reviews.

32. Defence has generally effective contracting arrangements, but the contractual off-ramps did not represent a practicable risk mitigation strategy, because Defence has not maintained the market knowledge required to inform an exit strategy. Relevant market knowledge would enable capability and value-for-money comparisons to be made of the Hawkei and comparable vehicles.

33. The project has conducted a series of reliability trials, and the test and evaluation period has been extended as part of this process. Defence approved entry into Low-Rate Initial Production in September 2017 while reliability issues were still being remediated through a Reliability Remediation Plan and a Reliability Demonstration Test. In compensation, Thales provided a one-year extension of the vehicle warranty and a $3 million discount on materials costs. Defence advised the ANAO in December 2017 that the core Integral Computing System—inclusive of all hardware, operating software, and the Battle Management System—is included on Low-Rate Initial Production vehicles (currently being produced). The project remains within the government-approved and contracted budget and scope, but reliability issues have led to schedule delays.

Responses to the audit

34. The proposed public and confidential reports were provided to the Department of Defence (Defence). Extracts from the proposed public report were provided to Thales Australia Limited (Thales) and to Elbit Systems of Australia (Elbit).

35. Formal responses were received from Defence, Thales and Elbit. The summary responses from Defence and Thales are provided below. The full responses from Defence, Thales and Elbit are provided at Appendices 1, 2 and 3.

Department of Defence

> The Department notes the ANAO's findings regarding the acquisition of the Hawkei – Protected Mobility Vehicle – Light and appreciates the work undertaken by the ANAO to consider Defence's

feedback in preparing the Final Report. The identified Key Learnings are acknowledged and will support Defence's approach to capability acquisition.

The Hawkei provides Australia with a domestically developed and sovereign capability that can be modified to meet emerging threats and protect Australian Defence Force personnel.

Defence is also confident that the Hawkei has the potential to be modified to meet the requirements of our security partners and provide these nations with a highly effective capability.

Thales Australia

Thales Australia welcomes the engagement with industry in the preparation of this report, resulting in the exclusion from publication of sensitive information that could have endangered soldiers' lives or unfairly prejudiced commercial interests.

By adopting the Australian designed and developed Hawkei the Australian Army has maintained a critical sovereign capability in protected vehicle design, engineering and manufacture in Australia. It is a capability advantage developed in the Bushmaster program that has been proven to save lives. This decision has delivered the world's best vehicle of its type, developed and manufactured in Australia, and supporting more than 400 Australian jobs directly in the assembly and manufacturing supply chain.

ANAO comment on Thales Australia's summary response

36. The treatment of sensitive information arises regularly in the context of Defence auditing. The ANAO has long-established processes for working with Defence to manage potential risks relating to the disclosure of sensitive information. These processes include the provision of consultation drafts to Defence, an exit interview, regular officer-level interactions, and seeking formal advice from Defence. In this audit, Defence and the ANAO worked together through an iterative process to identify and manage potential risks. In the course of the audit, a number of issues were raised with the ANAO and dealt with in respect of sensitive information. The removal of information considered to raise security issues was acknowledged by Defence in correspondence to the Auditor-General dated 12 December 2017. On 18 April 2018, Defence requested the removal of additional information, which was agreed by the Auditor-General.

Key learnings for all Australian Government entities

37. The ANAO has not made recommendations in this audit report, but rather has focused on the key learnings flowing from the audit for Defence and other Australian Government entities.

Procurement

- Effective benchmarking of cost and capability provides a basis for assessing value for money in sole-source procurements and maintaining competitive pressure in the negotiation and contracting phases.
- Effective benchmarking should provide the information needed to assess and explain differences in the price, quality and quantity of goods and services purchased.

Governance and risk management

- Contractual risk mitigation strategies such as off-ramps should be practicable, particularly in a sole-source procurement.
- When circumstances external to a project materially change and may affect the interests of the Commonwealth, entities should return to the Minister with updated advice.
- All the key drivers for an acquisition project should be transparent—including in the planning, advice and selection/assessment criteria relating to the project.

Audit findings

1. Background

Introduction

1.1 Land 121 is a multi-phase project to provide the Australian Defence Force with new field vehicles, modules and trailers. In 2006, the Department of Defence (Defence) began the process of acquiring a fleet of light Protected Mobility Vehicles[3] under Phase 4 of this wider replacement project (for the phases of project Land 121, see Appendix 4).

1.2 Defence's decision to acquire a fleet of protected vehicles was the result of lessons learned from Australian Defence Force operations since 1998. Unprotected vehicles were vulnerable to ballistic and blast threats prevalent in likely areas of operation. Defence recognised that these vulnerabilities were a constraint on the Australian Defence Force's ability to conduct operations.

1.3 Defence's initial procurement strategy, approved by the Government in October 2008, was to participate in the Joint Light Tactical Vehicle (JLTV) Program being developed by the United States Department of Defense, while retaining the option to procure a military-off-the-shelf vehicle if the Joint Light Tactical Vehicle proved unsuitable.[4] Australia joined the Technology Development phase of the JLTV Program in January 2009.

1.4 In December 2008, Defence received an unsolicited proposal from Thales Australia (Thales) for development of an Australian light Protected Mobility Vehicle (now known as the Hawkei). Defence then sought government approval for a 'Manufactured and Supported in Australia' option, which was approved in June 2009. Six options—three from the United States and three Australian-made options—underwent test and evaluation between July 2010 and June 2011, and in December 2011, Defence advised the Government to further develop the Thales Hawkei vehicle, and to retain the United States program as a backup.

1.5 Hawkei prototypes were tested extensively between 2012 and 2014 to ensure that the design was compliant with key capability requirements. In June 2014, Defence released a sole-source Request for Tender to Thales for the Hawkei.

1.6 In August 2015, Defence advised the Government that the Hawkei was its preferred option. In October 2015, Defence entered into a contract with Thales to acquire and support 1100 Hawkei vehicles and 1058 companion trailers. In the April 2018 *Defence Industrial Capability Plan*, the Hawkei was listed as an example of a Sovereign Industrial Capability Priority in the category of 'Land combat vehicle and technology upgrade'. The Plan defines Sovereign Industrial Capability Priorities as: operationally critical to the Defence mission; priorities within the Integrated Investment Program over the next three to five years; or needing more dedicated monitoring, management and support due to their industrial complexity, Government priority or requirements across multiple capability programs. Total estimated funding for the Protected Mobility Vehicle–Light capability is approximately $2237.1 million, as shown in Table 1.1, which includes project Land 121

3 Thales Australia produced the Bushmaster Protected Mobility Vehicle at Bendigo, in Victoria, from 1999 to 2016. The Protected Mobility Vehicle–Light sought by project Land 121 Phase 4 is a similar but smaller and lighter vehicle with improved mobility.

4 The Joint Light Tactical Vehicle is being acquired by the United States Army and Marine Corps to replace the High Mobility Multipurpose Wheeled Vehicle (more commonly known as a Humvee) that has been in service since 1985.

Phase 4 budgeted funds as well as related costs.[5] Defence has expended $463.1 million of project Land 121 Phase 4 funds to 30 June 2018, as well as $293.9 million on related costs.

1.7 In August 2017, Defence approved Thales' entry into Low-Rate Initial Production, which is currently scheduled to deliver 100 Hawkei vehicles by January 2019.[6]

Table 1.1: Defence funding approvals (direct and related) for the Protected Mobility Vehicle–Light capability

Project Land 121 Phase 4 approvals	$m
First Pass	5.7
Manufactured and Supported in Australia Stage 1	31.5
Manufactured and Supported in Australia Stage 2	48.4
Second Pass—Acquisition Contract	1328.5
Second Pass—Support Contract and other costs	529.1
Land 121 Phase 4 approvals subtotal	**1943.2**
Related costs	
Joint Light Tactical Vehicle Partner Nation, 2009	43.0
Purchase of additional Bushmasters to keep Bendigo facility in operation pending possible Hawkei approval, 2012	221.3
Defence project office	29.6
Related costs subtotal	**293.9**
Total capability approvals	**2237.1**

Source: ANAO analysis of Defence documentation.

1.8 Figure 1.1 outlines the Government approval stages for project Land 121 Phase 4.

Figure 1.1: Government approval stages for project Land 121 Phase 4

First Pass	Interim Pass	Second Pass
At First Pass, options under consideration are narrowed and funding is approved for various activities, primarily cost and risk analysis	Interim Pass is a phase that is sometimes used between First and Second Pass to further narrow options and approve further funding	Second Pass is when government endorses a specific capability solution and approves the funding required for the acquisition phase

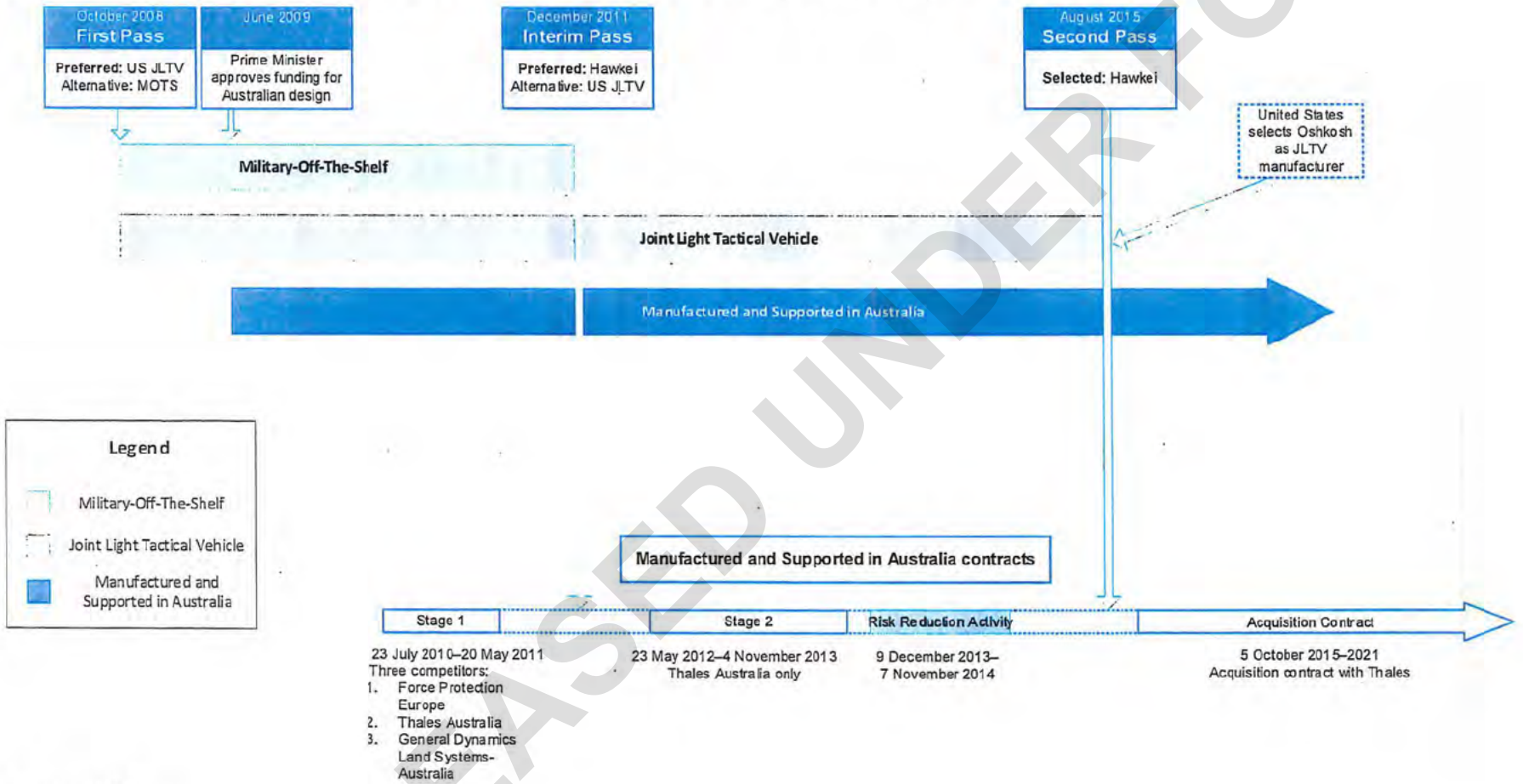
Source: ANAO analysis of Defence documentation.

1.9 Figure 1.2 shows the major decision points and contracts for this project.

5 This estimate includes expenditure on related project costs, such as the purchase of additional Bushmaster vehicles to maintain production at Thales' Bendigo facility (see paragraph 3.43).

6 The Low-Rate Initial Production phase was preceded by a Pre-Pilot build of 10 vehicles and five trailers, and a Pilot build of six vehicles and four trailers.

Figure 1.2: Timeline of project Land 121 Phase 4, Protected Mobility Vehicle–Light



Source: ANAO.

Audit approach

Rationale for undertaking the audit

1.10 This project was selected for audit because of the materiality of the procurement, the adoption of a sole-source procurement strategy, the time taken to select a vehicle, and the risk involved in manufacturing a relatively small run of vehicles when the United States was beginning a similar but much larger program.

Audit objective and criteria

1.11 The objective of the audit was to assess the effectiveness and value for money of Defence's acquisition of light protected vehicles, under Defence project Land 121 Phase 4. To form a conclusion against the audit objective, the ANAO adopted the following high-level criteria:

- Defence conducted an effective procurement process that achieved value for money.
- Defence has established effective project governance and contracting arrangements.

1.12 In particular, the audit examined the quality of:

- Defence's risk analysis of different options; and
- Defence's advice to government on value for money.

Audit methodology

1.13 The audit method involved:

- fieldwork at Defence's Land Systems Division in Melbourne, Defence's vehicle testing facility at Monegeetta (Victoria), Defence's explosives testing facility at Graytown (Victoria), the Thales facility in Bendigo (Victoria) and the Thales computing laboratory in Rydalmere (New South Wales);
- analysis of information from Defence systems covering the period 2006–18; and
- interviews with Defence project personnel and contractors.

1.14 This audit is the second in a series which has reviewed key phases of Land 121. Auditor-General Report No. 52 2014–15 reviewed the Australian Defence Force's Medium and Heavy Vehicle Fleet Replacement (Land 121 Phase 3B).

1.15 The audit was conducted in accordance with the ANAO Auditing Standards at a cost to the ANAO of approximately $870 000.[7]

1.16 Team members for this audit were Dr Patrick O'Neill, Dr Jordan Bastoni, Sophie Gan, Zak Brighton-Knight and David Brunoro.

7 This includes estimated external legal costs of $223 000 (ex GST) incurred during the audit.

2. Initial requirements and testing

Areas examined

This chapter examines how Defence determined the number of vehicles required, defined the project requirements, and conducted test and evaluation activities under two successive development contracts.

Conclusion

Defence developed six fundamental requirements for the Protected Mobility Vehicle–Light by 2009, and these have remained relatively stable. The Hawkei is a developmental vehicle, and Defence has conducted a large amount of test and evaluation covering its technical performance and useability.

Did Defence conduct an effective requirements definition process?

Defence recognised early that its initial required number of vehicles (Basis of Provisioning) was unaffordable within the budget that it had been allocated, and its advice to Government consistently made this point. In 2008, Defence advised the Government that it required 1300 protected vehicles and associated trailers. In 2015, the acquisition contract provided for 900 fully protected and 200 baseline (less protected) vehicles and 1058 trailers.

Defence did not complete a fully developed Function and Performance Specification until July 2010, after the Request for Proposal for an Australian-manufactured option was released in June 2009. The six fundamental requirements (survivability, mobility, payload, advanced communications, useability and sustainability) have remained relatively stable during the remainder of the project, and the detailed requirements underpinning them have been refined through developmental test and evaluation. Some requirements, such as weight and reliability, have been amended in the course of development. Defence decided in 2017 to remove the exportable power requirement, which had a contracted value of $30 million. As at July 2018, Defence was considering the return of funds from Thales following removal of that requirement.

Readiness for an advanced communications and control system is one of the six fundamental requirements. Defence did not have a detailed specification for this aspect of the vehicle until September 2014, and two rounds of requirements definition were conducted in 2016.

Vehicle numbers and budget

2.1 Defence based its initial calculations of the required numbers of Protected Mobility Vehicles–Light on strategic guidance from the Government as to Australian Defence Force readiness. In terms of process, Army used its 1999 Basis of Provisioning policy to calculate how many assets it needed. The calculation included unit entitlements, operating stocks and reserve stocks, which inform acquisition cost estimates.

2.2 In August 2007, the Government considered a Defence submission on the larger Land 121 project to replace Army's field vehicles and trailers. Defence advised the Government that it needed some 7100 vehicles in all, with 66 per cent to be protected vehicles. Defence further advised that purchasing fewer protected vehicles, and some modified commercial-off-the-shelf vehicles, would

reduce acquisition costs while allowing Defence to meet its capability requirements with acceptable risk to personnel and at a restricted scale of operations. The Government accepted this advice, opting for some 40 per cent of the field vehicles and trailers fleet to be protected, including 1243 light vehicles, with a budget provision of $1.2 billion. The Government agreed that an additional phase within Land 121, Phase 5, would deliver modified commercial-off-the-shelf vehicles to meet the remainder of the capability required under the overarching Land 121 project.

2.3 At First Pass[8] in October 2008, Defence advised the Government that current strategic guidance could be met with 1300 light protected vehicles.

2.4 In February 2010, when Defence assessed the Request for Proposal for a 'Manufactured and Supported in Australia' option[9], the Basis of Provisioning was 1300 vehicles and 1300 trailers. However, the cost of the three technically acceptable proposals for a 'Manufactured and Supported in Australia' option under consideration by Defence was found to exceed Defence's budget provision for the project.

2.5 At Interim Pass, in December 2011, due to affordability issues with the larger Land 121 project, Defence sought and received Government approval for the purchase of 894 light protected vehicles, with the balance to be made up of 407 unprotected vehicles—a total of 1301 vehicles. In order to maximise the number of protected vehicles it could afford, Defence postponed any further purchase of unprotected G-Wagons.[10]

2.6 The sole-source Request for Tender that was released to Thales on 13 June 2014 called for the provision of 1301 vehicles, 1288 trailers and supporting services. The Thales response, in September 2014, was unaffordable under Defence's existing provision for the project. In January 2015, Army revised its threshold numbers to 900 fully fitted vehicles, and baseline vehicles[11] to as close to 1301 as funds would allow.

2.7 At Second Pass, in August 2015, Defence advised the Government that its minimum Basis of Provisioning was no fewer than 900 vehicles (with add-on armour), 200 baseline vehicles (that can be fitted with add-on armour), and trailers. The Government approved entry into negotiations with Thales as the provider.

2.8 After Second Pass, Defence negotiated with Thales to bring the Basis of Provisioning closer to the targeted number. Contract negotiations concluded on 24 September 2015, with Defence achieving the Second Pass targets.

The six fundamental requirements for the Protected Mobility Vehicle–Light

2.9 Defence began this project in 2006–07 with a broad interest in: increased mobility; survivability; sustainability; and, in selected systems, lethality.

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8 At the time of the Land 121 Phase 4 acquisition, Defence projects went through a two-stage government approval process, comprising First Pass and Second Pass. At First Pass, options under consideration are narrowed, and funding is approved for various activities, primarily cost and risk analysis. Second Pass is when government endorses a specific capability solution and approves the funding required for the acquisition phase. Land 121 Phase 4 went to an additional stage of approval between First and Second Pass, termed Interim Pass.

9 See paragraph 1.4.

10 Unprotected four-wheel-drive vehicles manufactured by Mercedes-Benz.

11 Vehicles without mission kits and bolt-on armour.

2.10 By April 2009, Defence had settled on a balance of six fundamental requirements for its new capability, summarised in Table 2.1.

Table 2.1: The fundamental requirements for the Protected Mobility Vehicle–Light, 2009

Fundamental requirement	Examples
1. Survivability	Able to withstand: • landmine/improvised explosive device • bullets and projectiles Fitted with a remote weapon system
2. Mobility	On-road and off-road manoeuvrability Deployable by sea, rail, and C-130 Hercules aircraft Deployable by CH-47 Chinook helicopter[a]
3. Payload-carrying capacity	Different variants to carry between 1000–2000 kilograms
4. Command, control, communications, computers and intelligence (C4I) readiness	Built-in computer hardware A screen for each crew member Exportable power supply[b]
5. Useability	Noise and vibration management Climate control Legal and safety compliance
6. Sustainability	Reliable Maintainable Durable Technical manuals

Note a: The requirement for airlift underslung beneath a helicopter was originally (2007) to apply to selected vehicles only, but by 2009 was extended to all vehicles. This requirement is discussed further at paragraphs 2.36 and 2.38–2.40.

Note b: The removal of the requirement for exportable power in 2017 is discussed in paragraph 2.16.

Source: ANAO analysis of Defence 2009 Key Requirements Matrix.

2.11 Defence records indicate that, after the Minister's March 2009 announcement that a Request for Proposal for an Australian option would be released the following month (see paragraph 3.13), there was an 'accelerated timeline to develop specifications' for the Request for Proposal that was issued in June 2009. This accelerated timeline precluded the thorough development of an Operational Concept Document and Function and Performance Specification 'in the format that would normally be expected' at this stage of capability development, that is: a measure of operational needs and measures of effectiveness; and the functions, characteristics, performance and interfaces required, respectively. Instead of a fully developed Function and Performance Specification, Defence developed a six-page Key Requirements Matrix that it incorporated into the June 2009 Request for Proposal.[12] Defence recognised at the time that this did not represent a rigorous analysis of the capability required.

12 A Request for Proposal is an open-ended request seeking a design solution for a problem; a Request for Tender specifies in detail the solution that a buyer is seeking.

2.12 Defence approved a more developed Function and Performance Specification in July 2010, when it also signed development contracts with the three contractors that had passed the Request for Proposal stage. This specification contained 180 requirements.

2.13 Since the Protected Mobility Vehicle–Light is a developmental project, Defence had anticipated that over time it would increase its understanding of the requirements and refine them. After a first period of test and evaluation of prototypes in 2010–11, Defence made major revisions to the requirements in December 2011.[13] Defence also amended some requirements in May 2014 after the end of a further period of testing. The amended requirements included those relating to weight and reliability.

2.14 Readiness for an advanced communications and control system is one of the six fundamental requirements. In early 2014, Defence decided that the final delivery of the Integral Computing System would not occur until Final Operational Capability (2023). In August 2018 Defence advised the ANAO that the Integral Computing System is a developmental capability. Defence did not have a detailed specification for this aspect of the vehicle until September 2014, seven years after project activities commenced. Defence advised the ANAO that it underwent two rounds of requirements definition with Thales in 2016, prior to locking down the Integral Computing System specification.

2.15 The test and evaluation activities that led to the 2011 and 2014 revisions are discussed in the next section.

2.16 In March 2017, Defence decided to remove the requirement for exportable power, which had been contracted at a cost of $30 million.[14] Thales offered to return $13 million, later revised to $16 million, on the basis that it manages its supply chain holistically and was forecasting cost over-runs of $32 million on other supply-chain costs for Hawkei. In April 2018, as a result of the failure to reach a mutually beneficial solution, Defence sought advice from Thales about the potential impact of reinstating the requirement. Thales responded that this would take nearly two years, with risks of design change, significant earthing requirements, and retrofit or rework. In June 2018, Defence conducted a financial investigation, which found that:

- Thales had spent $520 000 to date on the requirement;
- supply chain cost over-runs of $32 million claimed by Thales were valid; but
- the amount of contingency used by Thales for these over-runs could not be clarified.

2.17 A contract change to remove the exportable power requirement and return some funds to Defence was under consideration as at July 2018. Another Defence project[15] is examining an ADF-wide solution for power generation in the field. In August 2018 Defence advised the ANAO that:

> There is also no direct correlation between the contracted value of Exportable Power and the financial return to Defence following the removal of that requirement. A Financial Investigative Services review confirmed that Thales manages its supply chain holistically, and the removal of the

13 The United States JLTV Program similarly revised its survivability requirements in February 2011.

14 In August 2018 Defence advised the ANAO that:

> The Hawkei power generation has not been reduced. The same level of power generation is still provided as designed; to provide electrical power to the communications, computing, and electronic systems required of a modern protected vehicle. The vehicle will still generate the power required, but it is not exported.

15 Joint Project 8140.

Exportable Power requirement at the contracted price created a net over-run across the remaining work packages.

Did Defence conduct an effective test and evaluation program to inform the Government's decision to acquire the Hawkei?

To manage the risk of this developmental project, Defence conducted a two-stage test and evaluation program of the Land 121 Phase 4 vehicle options between 2011 and 2013, including: user tests; landmine blasts; side blasts; ballistics testing; and air transportability testing. This program has contributed to Defence procuring a design (Hawkei) that meets the majority of its requirements.

By late 2013, the Hawkei design still represented a high risk. Defence amended some requirements as a result of the findings of the test and evaluation program, and conducted an additional Risk Reduction Activity during 2014, reducing the design risk to medium. Defence did not expect to achieve a stable design before signing the acquisition contract in late 2015.

2.18 In 2015, the ANAO discussed the value of test and evaluation in the Defence acquisition process:

> T&E (Test and Evaluation) is a key component of systems engineering and its primary function is to provide feedback to engineers, program managers and capability managers on whether a product or system is achieving its design goals in terms of cost, schedule, function, performance and sustainment. It also enables capability acquisition and sustainment organisations to account for their financial expenditure in terms of the delivery of products or systems that are safe to use, fit for purpose and that meet the requirements approved by government.[16]

2.19 The ANAO has also previously noted the importance of early test and evaluation in strengthening Defence's ability to identify and mitigate risks and provide informed advice for decision-making on a preferred supplier.[17]

2.20 Defence's 2007 test and evaluation policy stipulated that key milestones for major capital equipment acquisitions required:

> some form of Verification and/or Validation through T&E results to ensure that the risk is contained within acceptable boundaries, and that the intended system meets safety standards and end-user requirements.

2.21 Defence's test and evaluation of Land 121 Phase 4 has sought to validate that the vehicle platform can provide 'the best possible balance of six fundamental requirements' (as listed in Table 2.1). Test and evaluation occurred in two stages. The first stage, from 2010–11, involved initial testing of the United States Joint Light Tactical Vehicle options and Australian prototypes from three different companies. The second stage, from 2012–13, involved dedicated testing of Thales' Hawkei vehicle.

16 Auditor-General Report No.9 2015–16, *Test and Evaluation of Major Defence Equipment Acquisitions*, p. 7.

17 Auditor-General Report No.52 2014–15, *Australian Defence Force's Medium and Heavy Vehicle Fleet Replacement (Land 121 Phase 3B)*, p. 17.

Development test and evaluation, 2010–11

Reliability testing of Joint Light Tactical Vehicle prototypes, 2010

2.22 As discussed in paragraph 1.3, Defence participated in the Technology Development phase of the United States JLTV Program. Initial Australian testing of prototypes of the Joint Light Tactical Vehicle commenced in 2010. The aim of this testing was to inform the Government's consideration of the suitability of the Joint Light Tactical Vehicle prototypes for Australian needs. From August to December 2010, five prototypes and two trailers from two American manufacturers were tested at Defence's facility at Monegeetta, Victoria, achieving a total test distance of 14 691 kilometres. This trial cost $1.7 million. For Defence, two key outcomes from this trial were: the demonstrated ability to conduct testing for the United States program in Australia; and the contribution to the development of the United States requirements set. Reliability later became a key focus of planned future Hawkei testing.

2.23 The Joint Light Tactical Vehicle reliability trial was suspended in December 2010, pending Defence's development of plans for concurrent trials of United States and Australian-made vehicles.

User testing of American and Australian prototypes, 2011

2.24 During the first half of 2011, the Australian Defence Test & Evaluation Office conducted user testing on 13 prototype vehicles from six manufacturers: the three participants in the JLTV Program (BAE Systems, General Tactical Vehicles and Lockheed Martin), as well as three of the 12 responses to the Request for Proposal for a Manufactured and Supported in Australia option (Force Protection Europe, General Dynamics Land Systems–Australia and Thales Australia).[18] This trial cost $1.8 million.

2.25 The user testing found that:

> The PMV-L [Protected Mobility Vehicle–Light] prototypes offer significant capability enhancements on the LR110 [Land Rover] fleet which currently fill the role in the training environment, and are a lighter and more deployable protected vehicle for high threat operations compared to the Bushmaster; which is the current operational capability.

2.26 The user testing resulted in specific recommendations, including:

- a clearer articulation of the need for this class of protected vehicles; and
- review of the helicopter lift requirement so as not to impose limitations on the entire fleet.[19]

Survivability testing of American and Australian prototypes, 2011

2.27 The next set of test and evaluation activities assessed the level of protection offered to vehicle occupants. The trials were conducted in April–June 2011. Three United States vehicles and three Australian-option vehicles underwent various trials.

18 The other nine responses were received from Armet Armoured Vehicles Australasia Pty Ltd, Babcock International Group, KW Metal Works, Navistar Defence LLC, Oshkosh Corporation (two proposals), PJP Pty Ltd, Protected Transport Systems Pty Ltd, and Total Mobility Vehicles Ltd.

19 As indicated in Table 2.1, the requirement to be airlifted by a Chinook helicopter was extended to the entire fleet of vehicles by March 2009. Defence has ten CH-47F Chinook helicopters.

2.28 As a result of test and evaluation in 2010–11, Defence refined 17 of the 180 requirements for the capability, and added 26 requirements. This six-month process was completed in December 2011, just before Interim Pass consideration of the project by the Government.

2.29 By June 2011, the participants in the Manufactured and Supported in Australia option had achieved the following compliance with the requirements:

- Company A: 54 per cent, but critically deficient in payload.
- Company B: 67 per cent, but critically deficient in survivability.
- Thales: 34 per cent.

Development test and evaluation, 2012–14

2.30 The Test Concept Document developed by Defence in November 2011 for the Interim Pass decision envisaged:

- two years of Development Test and Evaluation (2012–13);
- one year of Acceptance Test and Evaluation (2015); and
- several months of Operational Test and Evaluation (2017).

2.31 The Development Test and Evaluation would include Reliability, Availability and Maintainability (RAM) assessments, user trials and survivability trials.[20]

Reliability testing, 2013

2.32 During 2013, under contract to Defence, Thales conducted studies to predict the reliability of the Hawkei.[21] Reliability is a key aspect of the overarching Sustainability requirement. In November 2013, Thales reported that the Hawkei should meet Defence's targeted Mean Time Between Failures of 1000 kilometres, but was unlikely to meet the required Mean Time Between Critical Failures of 10 000 kilometres.[22] Thales recommended 5000 kilometres as a more achievable figure for the latter target.[23]

User testing, 2012–13

2.33 From October 2012 to August 2013, the then Defence Materiel Organisation and the Defence Science and Technology Organisation (DSTO) assessed the ergonomic and Human–Machine Interface characteristics of the Hawkei. This included DSTO re-evaluation of Hawkei-specific trial data from 2011. The DSTO made a number of recommendations relating to seat design and adjustment, seat restraints, design of primary and secondary controls, and the integration of the body combat armour with the vehicles.

2.34 In September 2013, Defence conducted eight days of operationally focused user trials at Townsville and Cowley Beach (Queensland). These locations represented more realistic operating

20 The Government's December 2011 decision to select the Thales Hawkei vehicle as the Manufactured and Supported in Australia option is discussed at paragraphs 3.29–3.38.

21 The prototypes were driven a distance of 104 000 kilometres, against a target of 100 000 kilometres.

22 A critical failure is a mission-ending failure of a function such as engine, gearbox or driveshaft. An essential function failure is one that requires repair before a vehicle can undertake a subsequent mission.

23 By 2015, the Joint Light Tactical Vehicle demonstrated 7051 Mean Miles (11 350 kilometres) between Operational Mission Failure (the American term for Critical Failure), against a requirement of 2400 miles (3862 kilometres). Director, Operational Test and Evaluation, *FY 2015 Annual Report*, Washington DC, January 2016, p. 126.

conditions than Defence's vehicle test facility at Monegeetta (Victoria), but Defence's test agency judged that this was still short of the ideal hot–wet tropical test conditions typical of Australia and South East Asia.

2.35 After the trial, the Australian Defence Test & Evaluation Office reported that:

> The Hawkei demonstrated that it is relatively easy to drive, comfortable, capable and highly mobile. Despite being a prototype, the vehicle demonstrated reasonable reliability, good handling and was generally well designed.

2.36 The report identified four main issues with the Hawkei, concluding that:

> The most significant issue revealed by DT 903 [the trial] was the significant design compromise required to meet the CH47 EL [Chinook external airlift] requirement. This requirement places great constraints on the design and therefore the effectiveness of the vehicle. This requirement may also drive the through-life cost of ownership and these costs need to be carefully estimated and accepted.

2.37 In relation to the capability requirement for the Protected Mobility Vehicle–Light, the report suggested that Defence should carefully examine whether the Hawkei constituted a general-purpose Land Rover replacement or a specialist airlift Protected Mobility Vehicle–Light. In the latter case, consideration was suggested of a mixed fleet of Hawkei and next-generation Bushmaster, or two variants of Hawkei (a lightweight airlift version and a heavier general-service version). The report made 130 specific recommendations to improve the design and operation of the Hawkei.

Helicopter airlift test was postponed in 2013

2.38 Defence originally planned to trial the external airlift of a Hawkei by a Chinook helicopter during 2012–13, having identified airlift as a high priority for testing. A preliminary study of the Hawkei's suitability for airlift in September 2012 found that the Hawkei had not been designed in accordance with the relevant airlift standard, and indicated that further development work would be required.

2.39 Early in 2013, Defence removed airlift from the scope of the current trial, because of extensive tasking of the Air Movements Training and Development Unit (the unit had a five-year backlog) and a lack of civilian contractors with appropriate engineering experience within Australia. Defence's main test agency pointed out that significant planning shortcuts during 2012 had led to a lack of consultation with test agencies.

2.40 In lieu of an airlift trial using a helicopter, Air Force's airlift test unit conducted a proof-of-design activity in May 2013, lifting three different Hawkei vehicles and the trailer with a crane. Air Force concluded that there was a low risk that production vehicles would be deemed unsuitable for airlift. Helicopter airlift was successfully tested in June 2017 (see paragraph 5.28).

Survivability testing, 2013

2.41 The DSTO conducted two additional landmine tests on the Hawkei in August–September 2013.

2.42 In July–August 2013, the DSTO also assessed the Hawkei for protection against ammunition and fragmentation threats. The DSTO was confident that some identified deficiencies could be rectified by minor integration effort in future design evolutions.

Defence amended some requirements as a result of the 2012–13 testing, and further development and testing was undertaken before Second Pass

2.43 Due to the project's internal budget, the overall aim of the test and evaluation program during 2012–13 was to develop the Hawkei to meet 71.3 per cent of the threshold requirements and 27.9 per cent of the objective requirements.[24] In its assessment of Thales' performance during this stage, Defence found that Thales had achieved 54 per cent of the total requirements (Table 2.2) including 'most of the key requirements' bar one.

Table 2.2: Achievement of design requirements for the Hawkei by end of 2013

Requirement rating	Number of requirements	Achieved by end of 2013	Percentage achieved
Threshold (minimum)	425	292	68.7
Objective (preferred)	208	53	25.5
Total	**633**	**345**	**54.5**

Source: Adapted from Defence, *Contract Performance Assessment Report*, March 2014.

Evaluation of results and additional Risk Reduction Activity

2.44 In December 2013 Defence contracted Thales to conduct a nine-month Risk Reduction Activity, at a cost of $11.4 million, mostly funded through the use of $10.9 million of the project's contingency funding.[25] Defence recognised at this time that it was unlikely that the project could achieve full development of the remaining 30 per cent of threshold requirements within the available budget and schedule.

2.45 In early 2014 Defence amended the requirements for the Hawkei in a number of areas as a result of the 2012–13 testing, notably:

- the maximum weight for helicopter airlift was raised from 7000 to 7600 kilograms[26];
- the crew requirement for the Reconnaissance vehicle was reduced from five to four, to allow room for equipment and a gunner's platform;
- the reliability requirement (Mean Time Between Critical Failures) was reduced—from 10 000 kilometres at a 90 per cent lower confidence level to 6000 kilometres at an 80 per cent lower confidence level—so as to make it 'more achievable and testable'; and
- delivery of the Integral Computing System would be completed by Final Operational Capability (2023).[27]

2.46 The Defence Materiel Organisation rated the Hawkei's survivability and reliability as medium technical risks, and rated the design maturity as a high schedule risk. Defence paid Thales

24 A threshold requirement is the minimum target, while the objective requirement is the preferred target.

25 In May 2013, Defence's project office had advised a senior Defence committee that Thales had not yet complied with six requirements assessed as high technical or capability risks. The committee directed the project office to access contingency funds to reduce the risk of the Manufactured and Supported in Australia option.

26 At this time Army was expecting to begin receiving its new fleet of CH-47F Chinook helicopters from 2015.

27 Further development of the Integral Computing System is discussed at paragraphs 5.42–5.56. Defence advised the ANAO in December 2017 that the core Integral Computing System—inclusive of all hardware, operating software, and the Battle Management System—is included on Low-Rate Initial Production vehicles (currently being produced).

$7.3 million in capability incentive payments for the 2012–13 development activities, while withholding $336 000.

2.47 In April 2014, the Defence Science and Technology Organisation provided a Technical Risk Assessment of the Hawkei, finding that a stable design had not yet been achieved. The overall technical risk was assessed as high, and a number of specific areas were assessed as continuing to be high-risk.

2.48 In August 2014, during the Risk Reduction Activity, the DSTO conducted a further landmine test on a reworked Hawkei Utility. The vehicle passed the test.

2.49 In November 2014, the DSTO provided a second Technical Risk Assessment of the viability of the Hawkei project, based on the requirements as revised earlier in the year and the results of the Risk Reduction Activity. The DSTO found that the overall technical risk for the Hawkei was now medium, with a stable design expected to be achieved in another design iteration after Second Pass. The DSTO noted that:

- a detailed reliability test program had been developed;
- a blast retest had been successful; and
- Defence had decided that delivery of the Integral Computing System would be completed by Final Operational Capability (2023).

2.50 At the end of the Risk Reduction Activity, in November 2014, Defence found that Thales had achieved 62 per cent of the total requirements, as shown in Table 2.3.

Table 2.3: Achievement of design requirements for the Hawkei by end of 2014

Requirement rating	Number of requirements	Achieved by end of 2014	Percentage achieved
Threshold (minimum)	425	329	77.6
Objective (preferred)	208	64	30.8
Total	**633**	**393**	**62.1**

Source: Adapted from Defence, *Contract Performance Assessment Report*, November 2014.

2.51 Defence paid Thales $1.6 million in capability incentive payments, while withholding $131 000 because Thales did not achieve four of 52 requirements. By the end of 2014, Thales had been paid $58.5 million for development of the Hawkei design.[28] As a result, the Commonwealth has Intellectual Property ownership rights in the vehicle and will receive a royalty payment s45 from any export sales. Thales advised the ANAO that it contributed $34.5 million in self-funded Research and Development on the Hawkei project and a further $21.4 million to prepare production facilities and systems at its Bendigo facility for Hawkei production.

2.52 In November 2014, Thales had indicated to Defence its willingness to commit funding for further development to meet the reliability requirements. Defence advised the ANAO that Thales conducted a $16 million Hawkei Pilot Readiness Program during 2015. One key planned outcome was improved vehicle reliability, for which Thales budgeted $505 000. Thales conducted some further predictive analysis of reliability (see paragraph 2.32), and later included the costs of this development work in its acquisition contract pricing as reimbursement for costs incurred.

28 This comprised $9 million for Manufactured and Supported in Australia Stage 1, $38.1 million for Manufactured and Supported in Australia Stage 2, and $11.4 million for the Risk Reduction Activity.

2.53 In September 2015, just after Second Pass, Defence conducted a further technical review of the Hawkei, focusing on the reliability of 13 subsystems. Defence had identified that Thales was modifying or replacing several subsystems that had previously passed test and evaluation, and that this might impact the known reliability proven in earlier test activities.[29] The review concluded that several subsystems had not been verified under trial on current Hawkei platforms, but that the design of these subsystems was considered mature. Overall, the review rated reliability as a medium risk.

2.54 Defence conducted further test and evaluation activities after signing the acquisition contract for the Hawkei in October 2015. These activities were ongoing as at July 2018, and are discussed in the context of contracting arrangements at paragraph 5.28.

29 Thales advised the ANAO that the development of the project from prototypes towards production readiness involved a detailed review covering such things as Australian industry content, supplier selection, supply chain maturation, productionisation of parts and subsystems, and production efficiencies.

3. The procurement process (First Pass and development contracts)

Areas examined

This chapter examines Australia's participation in the United States JLTV Program, development of a Manufactured and Supported in Australia option, and Defence's advice to the Government at First Pass and Interim Pass.

Conclusion

At First Pass in 2008, a financial partnership with the United States in its JLTV Program was adopted as the primary acquisition strategy, at a cost of $43 million. In 2009, Defence sought approval to commence a parallel investment in Australian-based options that it had previously decided to be high-risk and high-cost. At Interim Pass in December 2011, Defence recommended and received approval for further development of the Thales Hawkei, because Defence considered it had the best prospect of meeting future needs, despite assessing it as the least developed Australian option. At the same time, Australia's financial partnership in the JLTV Program was discontinued amidst uncertainty as to the program's future, but it was retained as a possible alternative option for Second Pass. Within days of the Interim Pass decision, the United States decided to continue the JLTV Program. Defence did not reconsider its Interim Pass recommendations in the light of this significant change. The 2011 decision to discontinue Australian financial participation in the JLTV Program eroded Defence's ability to benchmark its procurement of the Hawkei against a comparable vehicle. In the absence of reliable benchmark information, there was a reduction in Defence's ability to evaluate whether procurement of the Hawkei clearly represented value for money.

3.1 The previous chapter focused on test and evaluation activities up to 2014. This chapter considers Defence procurement processes during the same developmental stages:

- First Pass to Interim Pass (2008–11); and
- Interim Pass to Risk Reduction Activity (2011–14).

Did Defence conduct effective procurement processes during the development stages up to Interim Pass (2008–11)?

At First Pass in 2008, Defence adopted what it considered the least risky option of partnership in the United States JLTV Program, at a cost of $43 million, while also retaining the option of a military-off-the-shelf option. After extensive industry lobbying, Defence sought approval to commence a parallel investment in Australian-based options that it had previously decided to be high-risk and high-cost and had not presented for government consideration at First Pass.

Between July and November 2011, Defence received strong indications and advice from the United States Government that the JLTV Program was likely to experience lengthy delays, and possibly be cancelled. In November 2011, the Defence Minister directed that no further Australian investment in the program be made without his approval.

First Pass decision: Australia participates in a United States development program

3.2 During 2007–08, Defence considered four options for filling its capability shortfall:

- Option 1: a military-off-the-shelf vehicle;
- Option 2: a next-generation (developmental) vehicle;
- Option 3: the United States Joint Light Tactical Vehicle through a Foreign Military Sales agreement; or
- Option 4: the United States Joint Light Tactical Vehicle by becoming a partner nation.[30]

3.3 Defence estimated that a military-off-the-shelf vehicle or the Joint Light Tactical Vehicle would cost some $1.2 billion to $1.3 billion, while a developmental option would cost some $1.9 billion. Defence considered that the previous tender process for Land 121 Phase 3 had confirmed that there were no Australian military-off-the-shelf manufacturers of the capability sought, and that the focus of Australian industry involvement would be in through-life support.

3.4 Defence decided to present Options 1 and 4 to the Government. This recommendation accorded with the findings of reviews that had suggested a reduced proportion of unique Australian solutions for Defence projects.[31]

3.5 At First Pass in October 2008, Defence advised the Government that its preferred option was participation in the JLTV Program, which was seeking to acquire vehicles closely aligning with Defence's requirements. Defence expected that Australian specifications (such as right-hand drive) could be included in the design and that it could achieve timely access to the production schedule and an exemption from Foreign Military Sales fees. This was also expected to help reduce sustainment costs.

3.6 The Government noted Defence's advice that:

- committing funding upfront minimised project risk, in keeping with the *Defence Procurement Review 2003* (Kinnaird Review);
- the high production numbers of Joint Light Tactical Vehicles would reduce Australia's costs through economies of scale; and
- Australia would gain invaluable knowledge and expertise during the JLTV Program's Technology Development phase.

3.7 In respect to a potential Australian-led developmental solution, which was considered but not presented to Government, Defence advised the Government that the cost involved in pursuing a unique design was around 50 per cent more than Options 1 and 4. An Australian developmental program would also take at least six years and present significant schedule and technical risks.

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30 The United States Department of Defense initiated the JLTV Program in November 2006.

31 The 2008 Mortimer Review included a recommendation for increased use of off-the-shelf solutions by Defence, and rigorous cost–benefit analysis of unique Australian solutions. David Mortimer AO, *The report of the Defence Procurement and Sustainment Review*, Canberra, 2008, pp. 19–20.
The 2009 Pappas Review similarly recommended a higher proportion of military-off-the-shelf purchasing by Defence. George Pappas, *2008 Audit of the Defence Budget*, April 2009, pp. 78–80.

3.8 On 1 October 2008, the Government gave First Pass approval for Australia's participation in the Technology Development phase of the JLTV Program. The Government decided that, once it became clear whether the Joint Light Tactical Vehicle would be cost-effective, Defence should return for Interim Pass government approval in early 2010, and then either continue to participate in the JLTV Program, or release a market solicitation for a current-generation (military-off-the-shelf) vehicle.

3.9 Australia became a participant in the JLTV Program in January 2009, at a cost of A$43 million. The United States committed up to A$286 million to the program's development.[32] Defence records indicate that Australia's involvement in the program directly influenced the United States to incorporate many requirements considered important to Australia.

Parallel Australian development

3.10 Defence records indicate that Thales conducted 'extensive lobbying' between late 2008 and early 2009, submitting an unsolicited proposal to the Victorian and Australian Governments for an Australian developmental option.[33] On 26 November 2008, the Parliamentary Secretary for Defence Procurement wrote to Defence asking if Defence had considered issuing a Request for Information to Australian companies capable of producing a light protected vehicle.

3.11 Defence estimated the acquisition costs for an Australian developmental option as $2 billion, around $700 million more than the two options presented at First Pass. In-service costs for the developmental option were expected to be 20 per cent to 100 per cent greater than a military-off-the-shelf capability or the Joint Light Tactical Vehicle.

3.12 Defence sought the Government's approval for a Request for Proposal for an Australian developmental option. When approving the issue of a Request for Proposal in February 2009, the Minister for Defence noted that Defence's advice went against advice from previous reviews into Defence procurement:

> Reluctantly agreed. This flies in the face of Pappas/Mortimer. What expectation will it raise? It also appears counter-intuitive, given we would be more reliant on the contingency provision if we go down a development path.

---

32 By December 2015, the United States had spent US$740 million on Joint Light Tactical Vehicle development, and expected to spend another US$207 million. *Selected Acquisition Report (SAR): Joint Light Tactical Vehicle (JLTV)*, 22 March 2016, p. 20.

33 Thales advised the ANAO in November 2017 that:

> at the time, thousands of US personnel had been killed in Iraq and Afghanistan as a result of their vehicles being destroyed by roadside bombs (Improvised Explosive Devices or IEDs). By contrast the Bushmaster protected vehicle proved to be a strategic asset for Australian forces in Iraq and Afghanistan due to the level of protection it provided against IEDs. A large number of Bushmaster vehicles were destroyed by roadside bombs in Iraq and Afghanistan but not one Australian soldier was killed in any of these blasts.
>
> The key argument advanced by Thales Australia in 2008–09 was that the capability developed through the Bushmaster program in protected vehicle design, development, manufacture and upgrade was considerable; that it gave Defence the option of an Australian-developed Protected Mobility Vehicle–Light; and that it was at risk of being lost once the Bushmaster production period ended if Australia adopted a fully imported Joint Light Tactical Vehicle.

Figure 3.1: The Oshkosh L-ATV, selected as the United States Joint Light Tactical Vehicle in August 2015

Source: Oshkosh Defence. Wikipedia Free License CC by-SA 4.0.

Figure 3.2: The Thales Australia Hawkei, selected as the Australian Protected Mobility Vehicle–Light in August 2015

Note: Like the Oshkosh vehicle shown above, the Hawkei has a Remote Weapon Station capability, but purchase of these systems is not part of the vehicle acquisition.

Source: Defence.

3.13 On 18 March 2009, the Defence Minister announced that the Defence Materiel Organisation intended to release a Request for Proposal for an Australian option the following month. On 2 April 2009, the Minister sought prime ministerial approval for a Request for Proposal for a vehicle 'Manufactured and Supported in Australia'. The Prime Minister approved the request in June 2009, with a number of caveats, noting that the Minister for Finance had advised that any such proposal

was likely to adversely impact the project's cost, technical and schedule risks, but that the Request for Proposal had already been publicly announced by the Defence Minister. The Prime Minister capped expenditure on the Request for Proposal at $0.5 million, and asked the Minister for Defence and the Minister for Finance to jointly assess the industry responses.[34]

Defence's assessment of the Request for Proposal responses

3.14 From September 2009 to February 2010, Defence evaluated the industry responses to its Request for Proposal.[35] Of the three proposals evaluated, Defence assessed two proposals as technically strong and offering no significant technical risks, while it assessed the Thales proposal as technically strong but high-risk, because of the developmental nature of the vehicle and non-compliance with protection requirements.

3.15 When value-for-money considerations were applied, Defence ranked the Thales proposal equal second, on the basis that:

> [Company A] offer a MOTS [military-off-the-shelf] based solution with low technical, schedule and cost risk compared with Thales' solution offering a fully developmental proposal with associated high levels of technical, schedule and cost risk.
>
> Without the level of detail an RFT [Request for Tender] solicitation would provide, the evaluation team has no option but to rank these two proposals as equal VFM responses.

3.16 Defence advanced all three contenders to the next stage of development.

3.17 Defence did not carry out the Prime Minister's June 2009 request that the Minister for Defence and the Minister for Finance should jointly assess the Request for Proposal (see paragraph 3.13).

3.18 In a further letter to the Minister for Defence in May 2010, the Prime Minister noted:

> I am advised there is little evidence to suggest that the MSA [Manufactured and Supported in Australia] proposals are likely to represent better value for money, a higher level of capability or a lower risk profile than is offered by the JLTV program.
>
> The JLTV program has had the benefit of 5 years and around $300 million invested in prototype development. In contrast, Thales as the only Australian-designed MSA option, assures Defence that it can produce a prototype in 9 months (having requested $33 million for six vehicles), although Defence intends to provide it with only $9 million. On this basis it is difficult to see that there can be a legitimate competition between these two options.

3.19 Notwithstanding these concerns, the Prime Minister authorised expenditure of $30 million for prototyping activities for the Manufactured and Supported in Australia option.

The first development contracts: Defence ranked Thales third at the technical level, but first in terms of value for money

3.20 In July 2010, Defence signed Manufactured and Supported in Australia development contracts, to a value of $9.9 million each, with three companies, as shown in Table 3.1.

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34 Defence advised the Parliament of its $1.8 billion budget for the project at Senate Estimates in June 2009. Senate, Foreign Affairs, Defence and Trade Legislation Committee, *Official Committee Hansard*, 4 June 2009, p. FAD&T 60.

35 The Request for Proposal was released on 5 June 2009, with responses due on 16 September 2009. Defence evaluated three proposals, from Thales Australia, Force Protection Europe, and General Dynamics Land Systems–Australia. The other respondents are listed in footnote 18.

Table 3.1: Participants in Manufactured and Supported in Australia Stage 1

Company	Proposed manufacturing location
Force Protection Europe	Mawson Lakes, South Australia
General Dynamics Land Systems–Australia	Adelaide, South Australia
Thales Australia	Bendigo, Victoria

Source: ANAO analysis of Defence documentation.

3.21 Each company delivered two prototypes on 23 February 2011, and testing concluded on 29 June 2011.[36] At the technical level, Defence ranked Thales third, because 'overall the Thales solution did not comply with the majority of the Commonwealth specification and the supporting documentation provided was significantly deficient'. The company's 'immature design and development program' therefore presented high cost, schedule and technical risk, while the 'substandard quality of their technical documents' left Defence with low confidence in Thales' ability to comply with the requirements. Defence had 'no certainty' that the final Thales product would fully meet its requirements, and added that:

> if the Commonwealth considers avoiding high risks to cost, schedule and capability, then it is not recommended to proceed with the Thales solution.

3.22 For the other companies assessed, one had a critical deficiency in respect of payload, and the other in respect of landmine protection, and Defence considered that each would require significant engineering development.

3.23 Defence ranked Thales first in terms of value for money, based on Thales having:

> a reasonable prospect for further development and a likelihood to result in Value for Money consistent with Commonwealth purchasing policies and the Evaluation Criteria.

3.24 Defence judged that Thales' significant deficiencies and the risk in its ability to successfully manage and deliver quality project and technical documentation could be managed effectively by strong Commonwealth guidance and management.

3.25 Defence noted that all three vehicles in the Manufactured and Supported in Australia process were unaffordable under the existing budget provision, but considered that the development of more accurate and comprehensive pricing, combined with capability trade-offs and potential Basis of Provisioning reductions, might make the overall proposal affordable.

Joint Light Tactical Vehicle Program uncertainty during 2011

3.26 The United States JLTV Program was scheduled to progress to the Engineering and Manufacturing Development phase in September 2011. In the lead-up to this phase, Australia considered whether to continue as a partner in the United States program.

3.27 In June 2011, Defence considered that there was a compelling case for Australia to continue its partnership status in the United States program, because it offered significant schedule, capability and cost advantages—including that it was considered the lowest technical risk and most affordable of all the options for a Protected Mobility Vehicle–Light.

36 For detailed discussion of test and evaluation activities during Manufactured and Supported in Australia Stage 1, see paragraphs 2.24–2.29.

3.28 From July to November 2011, there were strong indications and advice from the United States Department of Defense that the JLTV Program was likely to be significantly delayed or cancelled.[37] The program's uncertain status caused Defence to refrain from seeking Australian Government approval to commit to the next phase of development. In November 2011, the Australian Minister for Defence directed Defence to make no further financial commitment to the JLTV Program without his express approval.

Did Defence conduct effective procurement processes from the lead-up to Interim Pass until Second Pass (2011–14)?

At Interim Pass in December 2011, Defence recommended, and received approval for, the Thales Hawkei as the primary Australian acquisition option following the Stage 1 test and evaluation process conducted during 2010–11. Defence considered that this design had the best prospect of meeting future needs, although it was the least developed Australian vehicle design. Defence noted that all three Australian options it had tested exceeded the project's budget. Defence did not make the Government aware of the results of an economic study it commissioned that found there would be limited regional economic benefits from, and a substantial premium paid for, the Hawkei build.

Defence records indicate that a significant driver of the Hawkei project schedule was the retention of production capacity at Bendigo after Bushmaster production ceased in late 2016. Defence recommended further production of Bushmasters at Bendigo to keep the facility in operation pending possible Hawkei approval. This was funded at a cost of $221.3 million, representing more than a ten per cent increase to Defence's expenditure related to acquiring the Hawkei capability. This expenditure was not taken into account in assessing the overall cost and value for money of the Hawkei project at Second Pass.

Defence did not reconsider its Interim Pass recommendations after new and potentially material information became available regarding the JLTV Program soon after Interim Pass governmental approval, and did not seek ministerial approval to continue Australian participation in the JLTV Program. The decision not to seek ministerial approval to continue in the JLTV Program reduced Defence's ability to benchmark its procurement of the Hawkei and apply competitive pressure, and together with the decision not to factor-in related expenditure, reduced Defence's ability to evaluate whether procurement of the Hawkei clearly represented value for money.

3.29 Defence developed three business case options to inform Defence considerations prior to Interim Pass. These business cases considered:

- **Hawkei alone, $54 million**: Defence observed that this option would 'eliminate the unnecessary development, support and expense of other options'. Key disadvantages were the risks to cost, schedule and capability from a developmental vehicle; and the lack of competitive tension.

37 In September 2011, the United States Senate Committee on Appropriations recommended termination of the program. The uncertainty continued into November 2011, when the United States Secretary for Defense announced that congressional failure to reach agreement on deficit reductions might lead to the cancellation of several significant procurements.

- **Hawkei and another Australian contender, $74 million**: Defence noted that this option was affordable and maintained competitive pressure.[38]
- **Joint Light Tactical Vehicle, $71 million (in addition to Hawkei)**: Partner status would give Australia the ability to influence requirements, receive right-hand-drive prototypes and integrate Australian computer and communications systems, and would make this acquisition $65.1 million less expensive than through a Foreign Military Sales case.

3.30 Defence adopted the Hawkei option as its preference, observing that:

> The existence of competitive tension, although beneficial, means that a full partnership with each Participant is not possible which may result in a reduced ability by the project office to resolve technical design issues.

3.31 On 5 December 2011, at Interim Pass, Defence recommended the selection of Thales as the preferred tenderer, for further development of the Hawkei. Defence advised the Government that the capability sought was developmental and high-risk, but concluded that Thales should be selected as the Manufactured and Supported in Australia option, on the basis of having the best prospect of meeting future needs and providing value for money. Defence assessed that, while offering high cost, schedule and technical risk, Thales also provided a sound technical base from which to develop vehicles to meet the requirements, while the other contenders had critical technical deficiencies and were considered less affordable.

3.32 Defence did not make the Government aware of the results of an economic study it had commissioned from Monash University that found there would be limited regional economic benefits and a significant premium would be paid for the Hawkei build (see Box 1). Defence advised the ANAO in October 2017 that:

> Regarding the Monash University study, and why it was not mentioned in the Interim Pass or Second Pass cabinet submissions, it should be noted that the benefit to regional areas within Australia was not a key evaluation criteria.

Box 1: Economic impact study

In February 2011 an economic impact study of the effects of the Manufactured and Supported in Australia option on regional employment was presented to Defence. Defence had commissioned Monash University to undertake the study. In July 2012, Defence received an updated version of the study that took into account updated pricing. The study was considered valid by Defence as recently as March 2015, shortly before Second Pass.

The study compared the economic effects of Land 121 Phase 3B (purchase of medium and heavy vehicles) and Land 121 Phase 4 (purchase of Protected Mobility Vehicle–Light), and found that:

- in the long term, Thales' profits were likely to be sent to overseas shareholders. Most of the high-value materials would be sourced from outside Bendigo;
- the multiplier effect for job creation was small, with between 0.2 and 0.4 of a job being created in the region for each job created at Thales' Bendigo facility; further, the number of jobs that would be created represented substantially less than one per cent of the workforce in Bendigo and its surrounds;

38 Defence estimated the cost of progressing Thales alone at $54 million, and the cost of progressing the second-ranked contender alone at $31 million. The combined cost of progressing two Australian contenders included shared costs and so was less than the sum of pursuing both contenders.

Box 1: Economic impact study

- the jobs created in Bendigo were likely to crowd out a similar number of jobs from other parts of Australia; and
- limited justification had been provided as to why Bendigo required government assistance, given that its industrial base was reasonably diversified and its unemployment rate was only marginally higher than the national average.

The study calculated that, averaging the three Manufactured and Supported in Australia bids, the price premium paid to manufacture light Protected Mobility Vehicles domestically would be some $452 million. The study noted that payment of a premium of this magnitude would normally indicate that the area in question was 'among the most economically disadvantaged areas within Australia.' It further noted that:

> If Government pays a premium for reasons linked to regional development rather than defence, the reasons for this should be made transparent.

The study calculated the Effective Rate of Assistance[39] of the Manufactured and Supported in Australia option as being higher than the rate for almost all other areas of Australian industry. For Thales, the rate was calculated as 68.55 per cent. For the other two Manufactured and Supported in Australia contenders, the Effective Rate of Assistance was significantly higher than for Thales. The study cited the following examples of broader industry averages:

- Australian manufacturing sector: 4.6 per cent;
- Australian mining sector: 0.1 per cent; and
- Australian agricultural sector: 4.9 per cent.

The study noted that in 2011, the Australian motor vehicle manufacturing sector received an Effective Rate of Assistance of 11.8 per cent. By contrast, the study indicated that Defence projects were receiving much higher rates of assistance:

- Air Warfare Destroyer: 33 per cent; and
- Land 121 Phase 3: 35.8 per cent.

3.33 At Interim Pass, the Department of Finance's advice to the Government noted that the Hawkei target costs were three times those of the Joint Light Tactical Vehicle, and that the Hawkei was the least developed of the Manufactured and Supported in Australia options, having come last in the technical assessment. Finance recommended delaying Interim Pass until the status of the JLTV Program became clearer.

3.34 Defence also pointed out to Government that if the development of the Hawkei was successful, there would almost certainly be a production gap between the Bushmaster and Hawkei vehicles at Thales' Bendigo facility, because Bushmaster production was scheduled to end in late 2012. Defence advised that it would study the options available and advise the Government again in early 2012. The Treasury advised the Government at this time that, given that Hawkei production

39 Defence advised the ANAO that the Effective Rate of Assistance (ERA) measures the net incentive facing activities producing tradeable goods. The ERA includes border tariffs and taxes, but also non-border interventions such as production bounties, input taxes and subsidies, special credit facilities, special depreciation allowances, special tax arrangements and the provision of industry-specific infrastructure. In this way, it enables a complete picture to be built up of the pattern of incentives on resource use in industries as a result of the totality of government intervention.

was the principal reason for keeping Thales' Bendigo production line open, the costs of additional Bushmaster vehicles should be taken into consideration when assessing the Hawkei's value for money.

3.35 The Government gave the project Interim Pass approval on 5 December 2011, agreeing to the continuation of the Hawkei option, but directing Defence to continue to observe the JLTV Program, given its potential to offer a possible alternative option at Second Pass. Defence and Finance were to jointly agree the cost estimate difference between the Hawkei and the Joint Light Tactical Vehicle.

3.36 In relation to the Government direction for a joint Defence–Finance cost estimate, Defence provided the ANAO in October 2017 with a document referring to a January 2012 Defence–Finance meeting. The document included:

- Defence calculations based on information provided by the JLTV Program Office in November 2011, showing that the Hawkei was 1.3 times the cost of the Joint Light Tactical Vehicle; and
- Finance calculations based on a Congressional Research Service publication dated March 2011, showing that the Hawkei was nearly three times the cost of the Joint Light Tactical Vehicle.

3.37 Defence advised the ANAO that this 2012 document was provided to Government at Second Pass in August 2015. Defence did not provide evidence of this, or evidence that a single agreed cost comparison was undertaken with Finance as requested by the Government.

3.38 There was debate in 2013 between Defence and the Defence Materiel Organisation about the options decided at Interim Pass. In October 2017, Defence advised the ANAO that the Joint Light Tactical Vehicle 'was only to be observed by Defence in the unlikely event that the MSA [Manufactured and Supported in Australia] Hawkei option became unviable.' However, the 2012 Joint Project Directive included a statement that the project had two options under development—the Joint Light Tactical Vehicle and the Manufactured and Supported in Australia option—and that if uncertainty around the Joint Light Tactical Vehicle were resolved during 2012, Defence would assess it on its merits and make recommendations to Government accordingly.[40]

40 The approved 2012 Joint Project Directive for the Protected Mobility Vehicle–Light capability included:
- a statement confirming that the project had two options under development, the Joint Light Tactical Vehicle and the Manufactured and Supported in Australia option;
- an instruction to advise Defence leadership of material changes outside the parameters agreed by Government, for possible referral to Government;
- an instruction to the Chief Executive Officer of the Defence Materiel Organisation to contribute to development of the Second Pass submission for 'the PMV-L options';
- an instruction to the Chief of Army and the Chief Executive Officer of the Defence Materiel Organisation to monitor Joint Light Tactical Vehicle progress; and
- a statement that if uncertainty around the Joint Light Tactical Vehicle were resolved during 2012, Defence would assess it on its merits and make recommendations to Government accordingly.

The United States resumed the Joint Light Tactical Vehicle Program within ten days of Interim Pass

3.39 At Interim Pass on 5 December 2011, Defence advised the Government that the JLTV Program was experiencing delays and potential cancellation (see paragraphs 3.26 to 3.28).

3.40 The United States Congress confirmed funding for the JLTV Program on 15 December 2011, ten days after the Australian Government had approved Interim Pass. The Congressional Record stated that:

> the program will now pursue a competitively-selected single vehicle with a less complex design on a significantly accelerated timeline.[41]

3.41 Defence advised the Minister for Defence about the United States developments in March 2012, but did not seek to reconsider the Interim Pass recommendations. Defence also advised the Minister that:

> The continued observation of JLTV will provide cost, capability and schedule benchmarks for MSA [the Manufactured and Supported in Australia option] and allow us to assess JLTV's viability as an alternative to the Hawkei during the next critical development period.

3.42 In March 2012, the Chief of Army advised the Defence Materiel Organisation that it was highly relevant to remain engaged with the JLTV Program and ensure that viable options beyond the Manufactured and Supported in Australia option remained available. Australia continued to receive a range of data on the Joint Light Tactical Vehicle until July 2012 when the Technology Development phase concluded.

Defence purchased more Bushmasters in order to keep the Bendigo facility open, but did not factor this cost into the Hawkei project

3.43 In February 2012, Defence recommended that the Defence Minister authorise initial expenditure of $15.6 million for additional Bushmasters to be produced at Bendigo, so as to ensure that the production line would remain open and critical skills be retained, in case Hawkei production were to be approved for commencement in 2016. The Minister accepted the recommendation, and informed the Prime Minister, who requested advice on the strategic requirement for the vehicles and the basis for investing in this industry capability.

3.44 In June 2012, Defence advised the Government to purchase up to 214 extra Bushmaster vehicles, at a total cost of $205.7 million. Defence advised that there was limited strategic requirement for the vehicles. The purpose of the expenditure was to retain strategically critical skills at Bendigo to assure production capacity for Hawkei, should it be approved. The alternative of closing the Bendigo facility and later reopening it for Hawkei production was estimated to cost $33 million. The Departments of the Prime Minister and Cabinet, Treasury, Finance, and Foreign Affairs and Trade opposed Defence's recommendation. The Department of Finance calculated at this time that the cost for each direct job retained over the next four years (2012–16) was around $1 million per worker. Defence advised that there was still a high risk that Hawkei would not be suitable or preferred, and that any delay to Second Pass approval for Hawkei production would

41 *Congressional Record–House*, 15 December 2011, p. H9321.
The United States Government issued a Request for Proposal for the Engineering and Manufacturing Development phase of the JLTV Program on 26 January 2012, with the intention to award up to three contracts in mid-2012 for the delivery of 22 prototype vehicles per contract.

necessitate further Bushmaster production—beyond the current request—to keep the facility open. The Government approved the expenditure of $205.7 million for up to 214 extra Bushmasters in June 2012, additional to the $15.6 million approved in February 2012.

3.45 The $221.3 million spent to keep the Bendigo facility open has not been included in Defence's subsequent value-for-money considerations for the Protected Mobility Vehicle–Light acquisition—because it was spent as part of a separate Defence project (Land 116, purchase of Bushmasters).

The second development contract and the Risk Reduction Activity

3.46 After Interim Pass approval on 5 December 2011, Defence commenced a second stage of development, requesting a Contract Change Proposal from Thales for a proposed solution. Three issues—price, Intellectual Property and reliability—were assessed as critical deficiencies in the resulting Thales proposal.

3.47 Defence negotiated the Contract Change Proposal for the second stage of development with Thales during April–May 2012, including a price of $38.1 million, negotiated down from $49.1 million.

3.48 In May 2013, well before the conclusion of the second stage of development, Defence's Project Initiation Review Board directed the use of residual project and contingency funds to reduce the risk of the Manufactured and Supported in Australia option. The amount finally agreed for the Risk Reduction Activity ($11.4 million) was close to the reduction of $11 million that had been negotiated in April–May 2012 at the beginning of Stage 2.

3.49 Defence signed the contract change for the Risk Reduction Activity on 18 December 2013, with an agreed cost of $11.4 million.

3.50 Defence completed its evaluation of Thales' Stage 2 performance in May 2014.[42] Overall, Defence assessed the technical risk as medium, and the schedule risk as high. Regarding schedule risk, Defence assessed the project's path to Second Pass in 2015, and determined that:

> Hawkei remains a viable option for the Land 121 PMV-L capability, but is not ready for Second Pass consideration. Further development is required in order to reduce the residual risk to an acceptable level before a Second Pass decision can be taken.

3.51 Defence also noted that any delay to Second Pass could raise commercial and industrial risks with sustaining the Thales workforce at Bendigo.

3.52 The Risk Reduction Activity was conducted from December 2013 to October 2014.[43]

42 For test and evaluation activities during Manufactured and Supported in Australia Stage 2, see paragraphs 2.30–2.43.

43 For test and evaluation activities during the Risk Reduction Activity, see paragraphs 2.44–2.52.

4. The procurement process (sole-source tender and Second Pass acquisition decision)

Areas examined

This chapter examines the decision, conduct and outcomes of a sole-source tender for the Manufactured and Supported in Australia option in 2014–15; Defence's advice to the Government at Second Pass; and the negotiation of the acquisition contract in 2015.

Conclusion

Defence did not provide robust benchmarking of the Hawkei and Joint Light Tactical Vehicle options to the Government at Second Pass, to inform the Government's decision in the context of a sole-source procurement. At Second Pass, Defence advised the Government that the Hawkei would be approximately 23 per cent more expensive to acquire than the Joint Light Tactical Vehicle but would also be more capable. Without robust benchmarking of cost and capability, Defence was also unable to apply competitive pressure in its negotiations with Thales. Defence did not inform the Minister appropriately when material circumstances changed immediately after Second Pass and before contract signature. Publicly available information suggests that the (non-audited) per-unit price difference between the Hawkei and the Joint Light Tactical Vehicle exceeds the price difference advised to the Government at Second Pass.

Omission of highlighted text from public report required by certificate of the Attorney-General.

Areas for improvement

When an entity adopts sole-sourcing as its preferred option, it should have an appropriate risk mitigation strategy that maintains competitive tension, for example by maintaining accurate benchmarking of comparable alternatives.

Did Defence conduct effective procurement processes when tendering, assessing and recommending the sole-source of the Hawkei acquisition in 2014?

Defence decided to release a sole-source Request for Tender for the Hawkei in 2014. In this context, Defence usefully sought benchmarking analysis from a consultancy in 2014. The benchmarking analysis had to rely on 2011 open-source information for the Joint Light Tactical Vehicle for both price and capability (as Defence was no longer a partner in the JLTV Program). The analysis also compared the Joint Light Tactical Vehicle's 2011 compliance with requirements with the Hawkei's expected 2023 compliance with requirements.

Defence's assumptions as to government support for ongoing vehicle production at Thales' Bendigo facility and workforce continuity at the facility led Defence to maintain its schedule to Second Pass, rather than seeking consideration of a delay to obtain reliable benchmarking data.

Defence developed a revised acquisition strategy

4.1 In mid-2014, Defence developed a revised acquisition strategy for the Land 121 Phase 4 project. In Defence's view, as outlined in the strategy, the two key project drivers were the Government's direction to pursue the Manufactured and Supported in Australia option and the consequential need to maintain the Thales facility at Bendigo by manufacturing additional

Bushmaster vehicles. Defence would continue to monitor the United States Joint Light Tactical Vehicle and market-available vehicles as alternative options, in case the Hawkei failed to satisfy the capability requirements or proved unaffordable.

4.2 The strategy also noted that the Government had directed Defence to continue to observe the United States JLTV Program, given its potential to offer a possible alternative option at Second Pass. The strategy stated that:

> A thorough understanding of the value for money drivers that distinguish the MSA Option from the JLTV option will be critical for accurately informing decision makers.

4.3 In August 2014, Defence sought an update on the JLTV Program's status, costs, schedule and testing activities from the United States. The United States advised Defence that Joint Light Tactical Vehicle vendor data was unlikely to be released until the competitive phase of the program was completed in July 2015, but that Department of Defense cost models and specifications could be released. Defence concluded that this information would be insufficient to enable a detailed assessment of or direct comparison between the Joint Light Tactical Vehicle and the Hawkei, or any benchmarking of the Hawkei cost.

4.4 The United States provided technical information to Defence in January 2015, indicating that, of 49 relevant Australian requirements, the Joint Light Tactical Vehicle:

- exceeded four requirements;
- met 14 requirements;
- was likely to meet seven requirements; and
- did not meet eight requirements.

4.5 The remaining 16 Australian requirements were not directly comparable. Notably, the United States advised that component integration for communications equipment was likely to be similar, the Joint Light Tactical Vehicle could be produced in either right-hand-drive or left-hand-drive models, and the mission kits for Hawkei and the Joint Light Tactical Vehicle appeared very similar.

4.6 In regard to schedule, the United States confirmed its 2014 advice to Defence that it expected to award a contract in July 2015, and that Low-Rate Initial Production would begin in late 2015. Further, the official release of United States program data might not occur before October–November 2015.

Defence's approval of the sole-source Request for Tender

4.7 Defence released a sole-source Request for Tender to Thales on 17 June 2014, for acquisition and support of the Hawkei, with a deadline of 30 September 2014.

4.8 The Commonwealth Procurement Rules 2012 included exemptions which allowed the conduct of limited (or 'sole-source') tenders without broader market testing in a narrow set of circumstances. One of the circumstances was for the protection of essential security interests.[44]

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44 Commonwealth Procurement Rules 2012, paragraph 2.6:

> Nothing in any part of these CPRs prevents an official from applying measures determined by their Chief Executive to be necessary for the maintenance or restoration of international peace and

Defence exercised this exemption on the basis that it was procuring Ground Effect Vehicles and military design and development services—which was one of a series of categories previously identified by Defence as subject to this exemption.

4.9 The ANAO found no documentation of a rationale to support the use of this exemption.

4.10 In its approval documentation for the sole-source Request for Tender, Defence noted that its Capability and Investment Committee had directed that this step be undertaken, while also directing that comparative data on the Joint Light Tactical Vehicle should be developed for consideration at Second Pass.

4.11 Like all Commonwealth procurements, the Protected Mobility Vehicle–Light procurement remains subject to Division 1 of the Commonwealth Procurement Rules, which establish value for money as the core principle governing Commonwealth procurement.

Defence found Thales' Request for Tender response had 'potential' for value for money, but a Gate Review found the response 'unsatisfactory'

4.12 Defence developed eleven evaluation criteria for the Request for Tender. Defence's evaluation team assessed that Thales' initial tender response was 'significantly non-compliant' and 'unlikely to demonstrate value for money'. After further clarification from Thales during late 2014, Defence completed its evaluation of the tender response in January 2015, assessing only two of eleven criteria as fully compliant. The price tendered by Thales, $1.5 billion, when adjusted to include Defence's own project costs, was considered unaffordable under Defence's project budget.

4.13 To assist with its value-for-money assessments, Defence engaged Deloitte in November 2014 to conduct a benchmarking analysis.[45] Deloitte's analysis, which relied on publicly available data, compared the Hawkei design against a 2011 Joint Light Tactical Vehicle concept design and two military-off-the-shelf vehicles. According to the benchmarking, the Hawkei was 'judged to be the second cheapest, but most compliant vehicle when assessed against the ADF capability requirements'.

4.14 Two key issues relating to this assessment are:

- The cost assessment, which estimated the Hawkei as 23 per cent more expensive to acquire than the Joint Light Tactical Vehicle, was based on 2011 information because Defence was no longer a JLTV Program partner.
- The technical assessment compared Hawkei's claimed compliance with requirements (98 per cent of threshold requirements by 2023, when it is expected to reach Final Operational Capability) with the Joint Light Tactical Vehicle's compliance with requirements as tested at 2011 (83 per cent). As noted in paragraph 2.50, by November 2014 Defence test

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security, to protect human health, for the protection of essential security interests, or to protect national treasures of artistic, historic or archaeological value.

Defence policy also states that, while a procurement may be deemed exempt from the additional rules of Division 2 of the Commonwealth Procurement Rules, these rules—which include conditions for the conduct of a limited (sole-source) tender—are still seen as best practice.

45 At a cost of $356 595.

and evaluation activities had proven 62 per cent Hawkei compliance with the overall requirements.[46]

4.15 This analysis is discussed further at paragraph 4.34.

4.16 At Second Pass, Defence used this benchmarking analysis as a capability comparison, although the analysis was not intended to be a comprehensive capability assessment.

4.17 At the final meeting of Defence's Tender Evaluation Board on 21 January 2015, there was general consensus among Board members that there was not enough comparative evidence to indicate that the Thales tender response provided value for money.

4.18 In its final report, the Tender Evaluation Board documented that:

> As the L121-4 RFT [Land 121 Phase 4 Request for Tender] is a single supplier limited tender, no competitive comparisons were included in the tender evaluation process; however, to assist with VFM [value for money] considerations, benchmarking analysis was sought, vide reference H [Deloitte Interim report, 16 January 2015] to support the tender evaluation.
>
> Whilst a full VFM assessment cannot be made in this SER [Source Evaluation Report], the TEB [Tender Evaluation Board] assesses the Thales response has the potential, subject to successful negotiation of a number of critical issues, to represent VFM for the Commonwealth in both Acquisition and Support.

4.19 The final report also stated that Thales' response:

> reflects a high level of technical compliance against the Commonwealth vehicle system requirements, in a numerical sense. There are a number of key technical non-compliances against threshold requirements [...]

4.20 As part of its consideration of the Joint Light Tactical Vehicle option, the Tender Evaluation Board assumed that there would be a significant delay compared to the Hawkei option.

4.21 Defence concluded that Thales' response had potential, through negotiation, to represent value for money, and that negotiations should commence. After the tender evaluation, the project office adopted two approaches for resolving remaining issues:

- it approached Army for waivers of eight technical non-compliances[47]; and
- it sought formal Army advice of the required number of vehicles.

4.22 Two months later, in March 2015, an internal Defence Gate Review assessed the Thales response to the Request for Tender as:

- unsatisfactory and characterised by significant tender non-compliances and missing information; and
- lacking transparency over key financial aspects.

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46 Army received updated United States advice on Joint Light Tactical Vehicle requirements in January 2015 (see paragraphs 4.4–4.6), but this data did not reach Deloitte before their report was finalised; Defence took no steps to revise the Deloitte report. One example of the consequences of this approach is that Deloitte estimated the cost of right-hand-drive conversion at $40 000 per vehicle, whereas the United States advice indicated that the Joint Light Tactical Vehicle could be produced for either left-hand-drive or right-hand-drive operation at no additional cost.

47 The eight failures to meet the specification included two critical failures related to weight, two related to acceleration, and failures related to batteries, turning circle, electromagnetic compatibility and lubricants. Army accepted the eight limitations in February 2015.

4.23 The Gate Review Board considered that the tender response from Thales called for firm action:

> including achieving a level of financial disclosure commensurate with the sole source nature of this procurement.

Key assumptions compressed the schedule to Second Pass

4.24 A number of Defence records, including the internal Gate Reviews conducted in 2010, 2012, 2013 and 2014, noted the project's compressed schedule to Second Pass. The Gate Reviews concluded that the tight schedule was driven by Australian industry concerns, including concern to ensure continuity of activity at the Thales manufacturing facility in Bendigo, and wider regional employment issues.

4.25 At an early stage of the project, Defence considered options to align the schedules of the JLTV Program and the Manufactured and Supported in Australia option. In February 2011, one option under consideration was to request the United States to delay the decision point for Australian commitment to the Engineering and Manufacturing Development phase of the JLTV Program. The Chief of Army cautioned against any action that might delay the United States program or increase the technical risk to Australia should the Joint Light Tactical Vehicle eventually become the selected capability solution.

4.26 The 2012 Gate Review observed that by November 2013, only 70 per cent of the specification would have been verified, assuming that the schedule was complied with, and concluded that:

> this high risk development project is being jeopardised by the rush to Second Pass in April 2015 and the lack of a comprehensive acquisition strategy beyond Stage 2.

4.27 The 2013 Gate Review noted the lack of contingency in the schedule, and that the acquisition strategy did not have the funding or time to contain schedule, technical and cost risks. The Gate Review Board concluded that:

> progress to date had been impressive and that the vehicle had real potential. However, schedule imperatives meant that the current strategy needs to be reviewed. There was a clear need for an additional development stage to mature the design to a pre-production standard. This would do much to contain whole of life costs and provide a lower risk production stage.

4.28 The 2014 Gate Review noted that:

> Army has recently advised DMO [the Defence Materiel Organisation] that there is no operational imperative driving the schedule for the provision of PMV–L [the Protected Mobility Vehicle–Light].

4.29 The 2015 Gate Review reached a similar conclusion, observing that:

> Army has clearly stated there is no urgency for this capability, and so it may be in Defence's interest to signal to Thales a willingness to delay project approval if a satisfactory deal cannot be made. If, therefore, Thales applies artificial pressure to speedily conclude a formal contract, the Commonwealth risks achieving the best possible VFM [value for money] outcome.

4.30 Defence records indicate that two key assumptions were driving the Australian project in April 2015:

- that Government remained supportive of the sole-source tender approach; and
- that workforce continuity at the Thales Bendigo facility was the primary schedule driver.

4.31 On this basis, and given the United States advice that release of program data for the Joint Light Tactical Vehicle might not occur before October–November 2015 (see paragraph 4.6), Defence accepted that fully comparative data for the Joint Light Tactical Vehicle would not be available to inform its August 2015 Second Pass advice to Government. This approach differed from Defence's March 2012 advice to the Minister that its continued observation of the JLTV Program would provide cost, capability and schedule benchmarks for the Manufactured and Supported in Australia option and an assessment of its viability as an alternative to the Hawkei (see paragraph 3.41).

4.32 The ANAO found no evidence that Defence considered seeking to delay Second Pass to enable an authoritative value-for-money assessment of the two vehicle options.

Was Defence's advice to the Government at Second Pass in August 2015 based on up-to-date information?

Although the Government decided in 2011 that the Joint Light Tactical Vehicle would be the alternative option to the Hawkei, Defence's comparison of this vehicle with the Hawkei at Second Pass in August 2015 was not based on up-to-date information. As discussed above, Defence's consultancy advice provided to the Government at Second Pass—that the Hawkei would be 23 per cent more expensive to acquire than the Joint Light Tactical Vehicle, but would be a more capable vehicle—relied on 2011 open-source data for the Joint Light Tactical Vehicle for both price and capability.

Defence's advice to Government at Second Pass

4.33 At Second Pass in August 2015, Defence advised the Government that there would be significant staff reductions at Bendigo from the second quarter of 2016 if the Hawkei was not selected. Defence still did not advise Government of the results of the economic impact study (see Box 1 in Chapter 3) and so—as had occurred at Interim Pass—approval to continue the program was given without full knowledge of potential economic impacts. In its Regional Impact Statement, Defence stated only that the pursuit of the Manufactured and Supported in Australia option would yield benefit for regional Australia, with manufacturing to be located in Bendigo and support services likely to be located in Queensland.

4.34 Defence advised the Government that the benchmarking study it had commissioned from Deloitte indicated that, while the Hawkei would be 23 per cent more expensive to acquire than the Joint Light Tactical Vehicle, a number of comparison points favoured the Hawkei over the Joint Light Tactical Vehicle.[48] Defence further advised that there was no evidence of any Australian-made premium because the Hawkei was competitively priced against two military-off-the-shelf vehicles.[49] These vehicles had not been considered as an alternative to the Hawkei since 2011.

48 Defence cited the Deloitte report discussed in paragraphs 4.13–4.14.

49 The Ocelot, produced by Force Protection Europe; and the Eagle IV, produced by Mowag.

4.35 Table 4.1 summarises the main points of Defence's advice to Government at Second Pass, drawing on the benchmarking study. The table also summarises corresponding information available to Defence at the time.

Table 4.1: Second Pass advice to Government on Hawkei and the Joint Light Tactical Vehicle, August 2015—Defence comparative assessment

Defence's advice to Government	Relevant information available to Defence but not provided to Government
Capability	
Based on 2011 open-source data, Hawkei was more capable than the Joint Light Tactical Vehicle—especially in helicopter airlift, armour fit/removal and range.	Information provided by the United States in January 2015 (see paragraph 4.4) indicated many similarities between the Joint Light Tactical Vehicle and Hawkei requirements in key areas, but also indicated that the Joint Light Tactical Vehicle did not meet eight of 49 relevant Australian requirements. Further, as noted in paragraph 4.14, there are a number of grounds for doubting the usefulness of the Deloitte report on which Defence relied for this comparison. The report relied on 2011 public information for the Joint Light Tactical Vehicle for both price and capability, and compared this with Hawkei's expected 2023 compliance with requirements, and did not state the Hawkei's tested compliance as at 2014.
Army did not support a three-year delay in delivery of the Joint Light Tactical Vehicle and strongly preferred the Hawkei capability and schedule. The key drivers for the project schedule were rapid introduction into service and maintaining continuity of production at Bendigo in order to minimise cost to the project.	Defence did not provide the ANAO with evidence to support this statement. The March 2015 Gate Review noted that 'Army has clearly stated there is no urgency for this capability' (see paragraphs 4.28–4.29).
Cost	
Joint Light Tactical Vehicle cost data would potentially be delayed until mid to late 2016, and tender-quality cost data was unlikely to be available until the end of 2019, after negotiation of a Foreign Military Sales case.	United States officials advised Defence in January 2015 that the official release of program data for the Joint Light Tactical Vehicle might not occur until October–November 2015, after contract award in July 2015, official release processes, and any commercial protest period.
Based on open-source data, the benchmarking study indicated that the Hawkei was assessed to be value for money when compared to other military-off-the-shelf vehicles of similar capability. The benchmarking study indicated that the Joint Light Tactical Vehicle was likely to be 23 per cent less expensive in acquisition than the Hawkei, and because the Hawkei was assessed as competitively priced against the two non-JLTV comparators, there was no evidence of any Australian-made premium.	As noted previously in this table, this analysis relied on 2011 public information. Other military-off-the-shelf vehicles were not considered to comply with Defence's requirements, and hence had not been considered as an alternative to the Hawkei since 2011.

Defence's advice to Government	Relevant information available to Defence but not provided to Government
Inclusion of Hawkei in the Bushmaster support contract with Thales would lead to cost savings.	No cost data was presented on support of the Joint Light Tactical Vehicle in order to facilitate a balanced assessment of value for money in this context.
Economies of scale for support favoured the Hawkei.	Information on the potential economies of scale for acquisition or support of the Joint Light Tactical Vehicle was not available from the United States, so a fully comparative assessment was not possible.
Schedule	
Hawkei was considerably more advanced than the Joint Light Tactical Vehicle.	The Joint Light Tactical Vehicle was scheduled to enter Low-Rate Initial Production in August 2015 (approximately the same time as Second Pass approval for Hawkei). This schedule was advised to Defence by the United States in January 2015. Hawkei was scheduled to enter Low-Rate Initial Production in mid to late 2017.

Source: ANAO analysis of Defence documentation.

Did Defence adopt strategies to maintain competitive pressure in its contract negotiations?

Defence did not advise the Minister of the full implications of new and potentially material information—which included cost information—when the Joint Light Tactical Vehicle manufacturer was selected by the United States one week after Second Pass. Defence did not subsequently use the information available after the Joint Light Tactical Vehicle announcement to strengthen its negotiating position. Defence records indicate that Thales refused to negotiate anything of significance after it knew that the Australian Government had approved the acquisition of Hawkei vehicles. Defence advised the Minister that negotiations had been successfully concluded. The final negotiation report, completed one day after this advice to the Minister, drew to Defence's attention significant shortcomings in the negotiation strategy and outcomes.

In the absence of robust Defence benchmarking of the JLTV Program—to inform its management of the Thales Hawkei contract, maintain competitive pressure and inform its advice to the Government as to whether the accepted price difference of 23 per cent remained—the ANAO has used publicly available data to provide a (non-audited) per-unit cost-comparison of the vehicles. Although only one element of assessing overall value for money, this 'rolled-up' cost-comparison indicates that the per-unit cost of the Hawkei exceeds the 23 per cent price difference with the Joint Light Tactical Vehicle that was advised to Government in 2015. Defence advised the ANAO in December 2017 that a number of non-financial benefits of the Hawkei capability contributed to the overall value-for-money proposition of the Hawkei, including: the leading-edge protected vehicle and the Integral Computing System; the ability to adapt the capability to meet emerging threats; and the Commonwealth's Intellectual Property rights and potential royalties. These issues were mentioned in the 2015 Second Pass advice to Government, which supported the

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Hawkei acquisition and outlined the 23 per cent price difference of the Hawkei over the Joint Light Tactical Vehicle.

Advice to the Minister when the United States down-selected the Joint Light Tactical Vehicle manufacturer one week after Second Pass

4.36 The United States Army announced the contract award for the Joint Light Tactical Vehicle on 25 August 2015, one week after Defence received Second Pass approval to acquire the Hawkei, and six weeks before Defence signed its acquisition contract with Thales. Oshkosh (a major United States truck manufacturer) was awarded a US$6.7 billion contract for 17 000 vehicles over eight years.[50] Although the exact details of the contract are unknown, as the data is only from publicly available sources, in round terms this represents a unit cost of US$396 426.[51] On the same day, Joint Light Tactical Vehicle manufacturer Oshkosh announced that the first vehicles would be delivered ten months after contract award.[52]

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4.37 Defence advised the Minister on 24 September 2015 that the United States had awarded a contract for the Joint Light Tactical Vehicle, but did no analysis of whether the price, schedule or capability of the Joint Light Tactical Vehicle materially affected the decision to acquire the Hawkei. At the very least, this analysis would have provided an opportunity for Defence to develop, in consultation with the Minister, a negotiation strategy to achieve an improved value-for-money outcome from Thales.[53] Instead Defence advised the Minister that negotiations had been 'successfully concluded', with an outcome consistent with Government's approval at Second Pass. Defence also advised the Minister that the inclusion of Hawkei support into the existing Bushmaster contract would save $270 million, by making use of existing Thales infrastructure and the reduced cost of contract administration.

Defence's acquisition contract negotiations with Thales

4.38 The day after Defence tendered its advice to the Minister on the 'successfully concluded' negotiations, the Project Director and the Lead Negotiator completed their formal reports on the negotiations. The Lead Negotiator also reported separately on the same date.[54] The Lead Negotiator drew Defence's attention to significant shortcomings in its negotiation strategy:

> A sole source tender has a high risk of the tenderer over-pricing its proposal compared with the pressures faced in a competitive tender. Considering this situation, development of the ASIS [Acquisition and Support Implementation Strategy] for this project received particular attention,

50 David Vergun, *Oshkosh wins contract to manufacture joint light tactical vehicle*, United States Army News Service, 26 August 2015.
Oshkosh Defense, *U.S. Army Awards $6.7 Billion Joint Light Tactical Vehicle Contract to Oshkosh Corporation*, media release, 25 August 2015.

51 See paragraphs 4.48–4.53 of this audit report for further discussion of per-unit costs.

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52 This schedule was delayed by a commercial protest against the contract award. After the protest was abandoned, the United States Army lifted its stop-work order to Oshkosh on 15 December 2015. Congressional Research Service, *Joint Light Tactical Vehicle (JLTV): Background and Issues for Congress*, 31 May 2018, pp. 5–6.

53 As discussed in Chapters 3 and 4, Defence had adopted approaches which removed competitive pressure from the acquisition process. A robust negotiation strategy was one of the few remaining options available to Defence to strengthen the Commonwealth's hand.

54 Defence engaged a Lead Negotiator for a period of 10 months, at a cost of $433 522.

and special conditions were drafted to reduce the risk of Defence paying more than reasonable for the contract.

However, it is my view that Defence's decision to seek Government second pass approval prior to completion of negotiations undermined the strategy to get the best deal. It removed the negotiating leverage, and after Thales became aware that Government had given its approval, it refused to negotiate on anything of significance. Consequently the negotiated position is not as attractive as it could have been. The best way to test Thales' most competitive offer would have been to delay Government approval until negotiations were complete; and/or await costing information on JLTV to ensure the negotiation pressure was on Thales.

4.39 The Lead Negotiator made two recommendations:

- that Defence continue contract negotiations in order to achieve an improved value-for-money position; and
- that Defence delay contract signature until the reliability of the current Hawkei design had been proven to a predetermined level.

4.40 Defence did not accept the Lead Negotiator's recommendations. Defence decided that there were 'broader considerations', including the maintenance of a protected vehicles production capability at Bendigo, the maintenance of a skilled workforce between the Bushmaster and Hawkei contracts, the avoidance of significant ramp-up costs caused by any significant production gaps, and the economic impacts of potential job losses. In relation to reliability, Defence noted the financial penalties applying to Thales for failure to meet entry criteria for the reliability program, and that failure to meet the exit criteria for the reliability program was a trigger for exercising the contract termination (off-ramp) clauses (see paragraph 5.24).

4.41 Defence's formal approval documentation for entering into financial commitments under the acquisition contract cited the following as justification of the value for money offered by the contract:

- negotiated savings of $70 million over the initial Thales bid;
- negotiation of 1100 vehicles and 1058 trailers within Defence's budget provision;
- 98 per cent compliance with technical requirements[55];
- ownership of Foreground Intellectual Property; and
- a negotiated reduction in Thales' profit margin.

4.42 Defence's value-for-money discussion took no account of the Joint Light Tactical Vehicle contract award by the United States and the alternative value that it might offer.

Defence negotiated a Support Contract combining Hawkei and Bushmaster

4.43 In accordance with the Request for Tender, Thales presented a support proposal for the Hawkei that would involve some integration with the support structure already in place for the Bushmaster vehicles. This would use the infrastructure in place for Bushmaster support, but would use a separate contract and management regime.

4.44 Thales' tender response also provided two alternative options, although these options were not fully detailed or submitted as official positions of Thales:

55 For discussion of this figure, see paragraph 4.14.

- the development of a fully independent support structure (20 per cent more expensive than the tendered option); or
- the inclusion of Hawkei support in the existing Bushmaster support contract (20 per cent less expensive than the tendered option).

4.45 Since these options were not formally offered by Thales, Defence's tender evaluation did not consider them.

4.46 During 2014–15, Defence negotiated with Thales to reduce the tendered price of support from $106.8 million to $67.4 million. During this period, Defence also sought development of a formal offer from Thales of combined Hawkei–Bushmaster support. In July 2015, Thales presented a draft contract change proposal to incorporate Hawkei support into the Bushmaster support contract at a cost of $49.6 million. This offer was accepted by Defence and signed together with the acquisition contract on 5 October 2015. The final price to integrate Hawkei support was $52.4 million over five years, beginning in July 2018. Defence negotiations, therefore, saw a reduction relative to the tendered price, in line with the advice to Government at Second Pass.

4.47 Defence advised the ANAO that it continues to investigate possible measures designed to reduce the ongoing cost of transparent armour for the windows. The Defence Science and Technology Group prepared a paper on this subject in August 2017.

Vehicle cost-comparison

4.48 Effective benchmarking of cost and capability provides a basis for assessing value for money in sole-source procurements and maintaining competitive pressure in the negotiation and contracting phases. As discussed, the United States Joint Light Tactical Vehicle remained a capability option, to be observed and assessed by Defence, from the commencement of the Protected Mobility Vehicle–Light procurement process in October 2008 until Second Pass in August 2015. Further, the Australian Government decided in 2011 that the Joint Light Tactical Vehicle would be the alternative option to the Hawkei. A 2015 Deloitte study, commissioned by Defence and included in its 2015 Second Pass documentation, estimated that the Hawkei would be approximately 23 per cent more expensive than the Joint Light Tactical Vehicle but that the Hawkei would also be a more capable vehicle. That study was based on outdated 2011 open-source information for the Joint Light Tactical Vehicle, and no other benchmarking analysis was conducted after the Deloitte study.

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4.49 In the absence of robust Defence benchmarking of the JLTV Program—to inform its management of the Thales Hawkei contract, maintain competitive pressure and inform advice to the Government as to whether the accepted price difference of 23 per cent remained—the ANAO has used publicly available data released by the United States Department of Defense to provide a (non-audited) per-unit cost-comparison of the Hawkei and the Joint Light Tactical Vehicle. The calculation is a high-level cost-comparison based on publicly reported acquisition costs.[56] It is not intended to be a complete cost–capability comparison to assess absolute value for money.

4.50 To arrive at a 'rolled-up' unit cost, the ANAO sourced publicly available (non-audited) information for the initial United States acquisition and the forthcoming United Kingdom acquisition

56 Similarly, as noted in paragraph 4.13, Table 4.1 and paragraph 4.48, Defence's advice to Government at Second Pass in 2015 on its comparative assessment between Hawkei and the Joint Light Tactical Vehicle relied on open-source data.

of the Joint Light Tactical Vehicle. The reported value of these contracts was divided by the number of vehicles being acquired. The publicly available data indicates that:

- The United States placed an initial order for 16 901 Joint Light Tactical Vehicles, at a publicly reported cost of US$6.7 billion. This equates to an average 2015 cost of approximately US$396 426 (A$548 313) for the vehicle 'with full kit'.[57,58]
- In July 2017, the United Kingdom received United States acceptance for a Foreign Military Sale of 2747 Joint Light Tactical Vehicles, at a publicly reported cost of US$1.035 billion. This equates to an average 2017 cost of approximately US$376 775 (A$495 165) per vehicle. The cost also includes: baseline integration kits; basic issue item kits; B-kit armour; engine arctic kits; fording kits; run-flat kits; spare tire kits; silent watch kits; power expansion kits; cargo cover kits; maintainer and operator training; United States Government technical assistance and logistics support services; and other related elements of logistics and program support.[59]

4.51 In undertaking the comparison between international and Australian per-vehicle costs, the ANAO has taken as a starting point the s45 Hawkei acquisition contract[60], and excluded: s45 for inflation provision[61], s45 for trailers and s45 for the

57 Details of the Oshkosh acquisition contract were made public in 2015. The initial contract (US$114.7 million for 201 vehicles) included eight options, for a total of US$6.7 billion and 16 901 vehicles:
- Department of Defense, *Contracts*, media release No. CR-162-15, 25 August 2015;
- David Vergun, *Oshkosh wins contract to manufacture joint light tactical vehicle*, United States Army News Service, 26 August 2015;
- Defense News, *Oshkosh Wins JLTV Award*, 25 August 2015;
- Oshkosh Defense, *U.S. Army Awards $6.7 Billion Joint Light Tactical Vehicle Contract to Oshkosh Corporation*, media release, 25 August 2015;
- Department of Defense, *Selected Acquisition Report (SAR): Joint Light Tactical Vehicle (JLTV)*, 22 March 2016, pp. 7, 37;
- Congressional Research Service, *Joint Light Tactical Vehicle (JLTV): Background and Issues for Congress*, 10 January 2017, p. 5.

58 The first seven Joint Light Tactical Vehicles from Low-Rate Initial Production were delivered to the United States Army in September 2016, with a further 100 scheduled to be delivered over the following year. The first delivery of Hawkei Low-Rate Initial Production vehicles was scheduled for 19 January 2018. The United States advised Defence in June 2017 that, for Foreign Military Sales contracts finalised in 2017–18, vehicles were scheduled to be delivered from April 2019.

59 Details of the possible sale to the United Kingdom were made public in 2017:
- Defense Security Cooperation Agency, *United Kingdom—Joint Light Tactical Vehicles (JLTV) and Accessories*, media release, Washington DC, 10 July 2017;
- Office of the Secretary, Department of Defense, 'Arms Sale Notification', *Federal Register*, Vol. 82, No. 150, pp. 36758–60, 7 August 2017.

60 Details of the Hawkei acquisition contract were made public in 2015, including the cost ($1.3 billion) and the number of vehicles (1100): The Hon. Malcolm Turnbull MP, Prime Minister and Senator the Hon Marise Payne, Minister for Defence, *Army's Hawkei to be built in Australia*, media release, 5 October 2015. For details of the components of the Defence acquisition contract with Thales, see Table 5.1 of this audit report.
Table 1.1 of this audit report documents a further $908.6 million of expenditure related to acquisition of the Protected Mobility Vehicle–Light that has not been included in this calculation. These related costs include items such as early developmental work, support costs, the cost of partnering in the JLTV Program until 2012, and the purchase of additional Bushmasters to keep the Thales Bendigo facility open pending possible Hawkei approval.

61 Defence advised the ANAO in December 2017 that the Hawkei acquisition involved an inflation provision of s45. It is not known whether the Joint Light Tactical Vehicle acquisition includes such an estimate.

Engineering and Manufacturing Development stage of the acquisition contract.[62] After excluding these items, the adjusted contract cost is s45 . This equates to an average unit cost of s45 for each of the 1100 Australian vehicles and associated mission equipment.

4.52 Although only one element of assessing overall value for money, the ANAO's high-level cost-comparison indicates that the cost of the Hawkei capability exceeds the 23 per cent price difference advised to the Government in 2015. The ANAO calculations do not account for other differences between the three nations' acquisitions, such as numbers of vehicle variants and mission kits[63], possible conversion costs for right-hand-drive[64] and environmental requirements. These factors, as well as currency fluctuations, may affect the cost difference between the Hawkei and the Joint Light Tactical Vehicle.

4.53 Defence advised the ANAO in December 2017 that the average cost of a base Hawkei vehicle is s45 (price basis September 2014). If mission kits, vehicle equipment and the initial development cost of the Integral Computing System ($1.9 million)[65] are included, the average unit cost is s45 . The difference between this figure and the indicative average unit cost of s45 in paragraph 4.51 is s45

Recent premiums for Australian manufacture of Defence capabilities

4.54 Recent Defence acquisitions have involved price premiums of between 15 and 32 per cent paid by Defence for Australian manufacture of other new capabilities. For example:

- in 1999, Defence's Strategic Review of munitions manufacturing calculated an expected price premium of 32 per cent for a domestic munitions manufacturing capability[66];
- in 2007, Treasury noted that the premium associated with building the Air Warfare Destroyers in Australia was around $1 billion, representing an effective rate of assistance of over 30 per cent for naval shipbuilding[67]; and
- in 2015, Defence's cost models forecasted a premium of around 15 per cent for the Australian build of the Future Submarine.[68]

4.55 The Defence-commissioned economic impact study for the Manufactured and Supported in Australia option indicated that this option would involve a premium of some $452 million.[69] This economic study was still considered valid by Defence in 2015. As discussed, a Deloitte study in February 2015 commissioned by Defence calculated that the Hawkei would be approximately 23 per cent more expensive to acquire than the Joint Light Tactical Vehicle.

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62 Defence advised the ANAO in December 2017 of the cost of trailers and the Engineering and Manufacturing Development stage.

63 The ancillary mission kits for the Hawkei include add-on armour, manned weapon mounts and winches.

64 As noted in footnote 46, Deloitte estimated the cost of right-hand-drive conversion at $40 000 per vehicle, whereas the United States advice indicated that the Joint Light Tactical Vehicle could be produced for either left-hand-drive or right-hand-drive operation at no additional cost.

65 The current costs of the Integral Computing System are reported in Table 5.1 of this audit report.

66 Auditor-General Report No.26 2015–16, *Defence's Management of the Mulwala Propellant Facility*, p. 21.

67 Auditor-General Report No.22 2013–14, *Air Warfare Destroyer Program*, p. 20. The budget for this project later received a further $1.2 billion; Auditor-General Report No. 40 2016–17, *2015–16 Major Projects Report*, p. 161.

68 Auditor-General Report No.48 2016–17, *Future Submarine—Competitive Evaluation Process*, p. 25.

69 The 2012 economic analysis assumed that an Australian build would cost some $1.157 billion (2012 pricing), based on the average of the three responses to the 2009 Request for Proposal (see Box 1 in Chapter 3).

Non-financial benefits of the Hawkei selection

4.56 In December 2017, Defence advised the ANAO of 'the following non-financial benefits of the capability, which contribute to the overall value for money proposition of the Hawkei':

> —The Hawkei is a leading edge protected vehicle with a Thales-designed integral computing system;
>
> —The resultant Australian industry capability is able to provide flexible support for and adaptive development of the capability to protect soldiers on operations over its life; and
>
> —The intellectual property rights are retained by the Commonwealth and there are potential financial benefits from future overseas sales of the vehicle.

4.57 These issues were mentioned in Defence's 2015 Second Pass advice to Government, which supported the Hawkei acquisition and stated that the Hawkei was estimated to be 23 per cent more expensive to acquire than the Joint Light Tactical Vehicle.

5. Governance and contracting arrangements

Areas examined

This chapter examines project oversight, contractual provisions, production progress (including the Integral Computing System and reliability trials), and the transition into Low-Rate Initial Production.

Conclusion

Defence has established appropriate oversight arrangements for the project. However, Defence postponed the May 2017 Gate Review, with the result that the project passed the major milestone of entry into Low-Rate Initial Production without the scrutiny offered by these reviews. Test and evaluation activity remains ongoing, as Defence entered Low-Rate Initial Production without retiring risk to the extent that it had planned. Defence has amended its contract with Thales to manage the related delays and cost increases. The project remains within the government-approved and contracted budget and scope, but reliability issues have led to schedule delays.

Area for improvement

Risk management strategies, such as off-ramps, that are included in a contract need to be viable and practicable.

Does Defence have appropriate oversight of project progress?

Defence has established appropriate oversight arrangements for the project. Senior leadership is updated on a monthly basis about key project issues. Regular contract progress meetings are held between senior project staff from Defence and Thales. The minutes of the meetings show a detailed presentation of information from Thales, ranging across the breadth of the project, and probing questioning from Defence that shows active management.

The 2016 Gate Review of the project raised concerns about the major challenges facing the project office and the risk of major failure by the contractor. The Gate Review scheduled for May 2017 was postponed until October 2017. This decision meant that the project passed the major milestone of entry into Low-Rate Initial Production without the scrutiny offered by these reviews.

Project governance and executive reporting mechanisms

5.1 The Land 121 Phase 4 project is administered by the Land Vehicle Systems Branch in Defence's Capability Acquisition and Sustainment Group.

5.2 The Deputy Secretary of the Capability Acquisition and Sustainment Group receives monthly updates from the project office. The updates provided in 2017 have included:

- reliability—including the conduct and results of trials and testing, and reliability remediation work being undertaken by Thales;
- the status of design reviews;
- the conduct and results of user trials;
- progress with the development of the Integral Computing System;

- the conduct and results of blast testing; and
- planning for airlift trials.

Contract Progress Meetings

5.3 Defence and Thales held ten Contract Progress Meetings from January 2016 to May 2018. Under the contract, Thales provides status updates on the project at these meetings.

5.4 The first meeting was held on 18 January 2016. Agendas are comprehensive and standardised.

5.5 Several ongoing management issues were discussed over the course of the 2016–17 meetings, for example:

- **Risk**. Defence sought greater visibility of Thales' risk management procedures and risk logs. Defence expressed concerns with the risks presented by Thales, noting that logs were not being kept current. Thales informed Defence that personnel availability had prevented the updating of risk logs.
- **Reliability**. Discussions on reliability focused on the administration of reliability remediation, such as dates for trials and meetings to discuss outcomes. Defence raised concerns with Thales' communication of how reliability remediation was being progressed.
- **Recruitment and retention**. Recruitment and retention of sufficient, appropriately skilled, personnel at Thales' Bendigo facility were raised at several meetings. Thales reported the personnel shortfall as impacting design work.
- **Ongoing optimisation of the Hawkei design**. Defence and Thales discussed reducing the mass of the Hawkei. Defence also queried if it would be possible to increase the trailer payload.

The 2016 Gate Review

5.6 Seven Gate Reviews of the project were conducted from October 2010 to October 2017. The 2016 Review occurred on 16 May 2016,[70] and considered several issues, including: clarity of scope and requirements; suitability of the acquisition approach; vehicle progress and performance; progress and performance of the Integral Computing System; project schedule; project budget; workforce resources; risk management; and support budget.

5.7 The May 2016 review commended the work the project had done to achieve Second Pass, but noted that there was a risk of a major failure by Thales:

> The [Gate Review] Board heard that Thales is a strategic partner of Land Systems Division and that the project has a close working relationship with the company. However, the Board formed the view that the fixed price nature of the development contract, coupled with the immaturity of the [Integral Computing System] design in particular and the relatively small contractor Management Reserve [...] poses a risk of a major failure by Thales. The Board was concerned that the project lacks any real plan to deal with such a failure beyond extant escalation procedures.

70 Earlier Gate Reviews of the project are discussed at paragraphs 4.24–4.29.

5.8 The review also expressed concerns that the project office did not appreciate the magnitude of the challenge ahead, noting that some schedule slippage had already occurred and that schedule slippage at this stage in a project is difficult to recover.

5.9 On the relationship between Thales and Defence, the review observed that:

> Thales has already been successful in pressuring the Commonwealth to relax requirements and can be expected to do so again in the future if Thales fails to perform. A plan for managing a major contractor failure needs to be developed and agreed well in advance so that, should it become necessary, the Commonwealth can respond with clarity of purpose and consistency across all stakeholders.[71]

5.10 The Gate Review recommended that: the Project Director write to Thales to express concern at the issues affecting the project; a non-advocate review of project scope and technical risks be undertaken; a senior board including Defence and Thales be established to oversee the management and technical progress of the project; a strategic plan be developed for any major failure by the contractor; a set of metrics be developed to measure Integral Computing System development progress; and a staff member be embedded in Thales' facilities at Bendigo and Rydalmere.

5.11 The outcomes of some of these recommendations are discussed in more detail later in this chapter.

Strategic Relationship Board

5.12 Having considered the 2016 Gate Review recommendation to establish a Strategic Relationship Board with representation from Defence and Thales, Defence's Head Land Systems[72] determined that a board would be established, but it would have a wider remit and representation than the one envisaged by the Gate Review, and would encompass all the Defence land capabilities provided and supported by Thales.

5.13 The Terms of Reference for the Strategic Relationship Board state that the Board will focus on three key areas: the strategic relationship between Defence and Thales; the achievement of value for money; and the delivery and support of capabilities.

5.14 The first meeting of the Strategic Relationship Board was held on 26 April 2017 and was co-chaired by Defence's Head Land Systems and Thales Australia's Vice President (Land). The Board discussed topics relating to the Hawkei and Bushmaster vehicles. The Hawkei topics discussed were: provision of revised cost estimates for the Integral Computing System; a meeting for senior executives as part of the mid-point review for the third Reliability Growth Trial; and discussion of three Hawkei capability non-compliances.

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71 Thales advised the ANAO in August 2018 that:

> Thales rejects any suggestion that undue pressure has been brought to bear. On the Hawkei project the focus of the Thales and Defence project teams has been on achieving successful delivery. The working relationship has been characterised by transparency and collaboration, evidenced by the constructive way project challenges have been overcome in order to deliver the 'best vehicle of its type in the world, and made in Australia', according to Maj Gen Gus McLachlan, Forces Commander Australian Army, 24-11-17.

72 Land Systems is a division of Defence's Capability Acquisition and Sustainment Group. Land Vehicle Systems Branch is part of the division.

The 2017 Gate Review

5.15 In March 2017, following questioning from one of the 2016 Gate Review members who had independently raised serious concerns about the risks that had faced the Hawkei project for several years, the responsible Defence Deputy Secretary delayed the 2017 Gate Review, on the basis that:

> My direction was to delay the internal IAR [Independent Assurance Review][73] to allow the project team to focus on the ANAO requirements which in recent times have been extremely demanding (some might say unreasonable)...
>
> I have directed that our priority is to fulfil our obligations to the ANAO audit program first and that IARs are to be delayed until such time that the burden of the audit process has been met.

5.16 In October 2017, Defence advised the ANAO that:

> The Gate Review was deferred to 31 Oct 17 to enable the Project to invest available resources into the ANAO Major Projects Report response, ANAO Performance Audit, CASG Systems Project Office Review and CASG Project Performance Reporting pilot and completion of Reliability Growth Trials already underway. These activities represent significant increased tempo during the stated period, and also include certain reporting/reviews.

5.17 The delayed Gate Review occurred in October 2017, after Defence's decision to enter Low-Rate Initial Production.[74] The report from this Gate Review (approved by the Deputy Secretary CASG in March 2018) noted the difficulty in meeting the requirements for the vehicle and stated that:

- the current vehicle configuration did not yet closely represent the production build standard;
- the vehicles would likely fail to demonstrate the required level of reliability during the Reliability Demonstration Test[75];
- Army was not prepared to compromise further at this stage on the reliability requirement, but could accept some slippage in schedule; and
- if the Production Reliability Acceptance Test was delayed and further reliability trials were undertaken, the project should be considered as a candidate Project of Concern, and the next Gate Review should be undertaken shortly before completion of the further reliability trial, in order to assess progress and inform next steps.

Has Defence established effective contracting arrangements?

Defence has generally effective contracting arrangements, but the contractual off-ramps did not represent a practicable risk mitigation strategy, because Defence has not maintained the market knowledge required to inform an exit strategy. Relevant market knowledge would enable capability and value-for-money comparisons to be made of the Hawkei and comparable vehicles.

73 Defence has recently changed the name 'Gate Review' to 'Independent Assurance Review'. For simplicity, this audit report uses the term 'Gate Review'.

74 The potential for external scrutiny should be considered part of normal business processes within the Capability and Sustainment Group. The postponement of the 2017 Gate Review delayed a key internal review process and risk mitigation measure at the significant commitment milestone of entry into Low-Rate Initial Production.

75 The Reliability Demonstration Test is discussed at paragraphs 5.40 and 5.65–5.77.

The project has conducted a series of reliability trials, and the test and evaluation period has been extended as part of this process. Defence approved entry into Low-Rate Initial Production in September 2017 while reliability issues were still being remediated through a Reliability Remediation Plan and a Reliability Demonstration Test. In compensation, Thales provided a one-year extension of the vehicle warranty and a $3 million discount on materials costs. Defence advised the ANAO in December 2017 that the core Integral Computing System—inclusive of all hardware, operating software, and the Battle Management System—is included on Low-Rate Initial Production vehicles (currently being produced). The project remains within the government-approved and contracted budget and scope, but reliability issues have led to schedule delays.

5.18 To consider the effectiveness of Defence's contracting arrangements, the ANAO reviewed:

- the contractual provisions;
- contract management relating to the two major design challenges:
  - achieving agreed levels of reliability; and
  - the Integral Computing System; and
- the conditional entry into Low-Rate Initial Production.

Contractual Provisions

5.19 The Hawkei acquisition contract includes provisions that enable Defence to monitor and manage Thales' performance. The contract provides for:

- payment against milestones. Defence can employ a number of remedies if Thales fails to meet key milestones;
- liquidated damages that Defence can choose to apply if Thales fails to deliver against nine specific milestones; and
- a number of off-ramps that enable Defence to terminate the contract.

Milestones

5.20 The acquisition contract lists 58 milestones against which Thales will be paid, covering three stages of Hawkei development and production. The original and current costs of each stage are shown in Table 5.1. At least 20 per cent of expenditure under the acquisition contract is for development activities, comprising Engineering and Manufacturing Development and Integral Computing System development; further reliability development is also occurring during Low-Rate Initial Production.

5.21 As at August 2018, Defence had executed 41 contract changes with Thales, mostly relating to expected development costs for the Integral Computing System. A further six contract changes were being planned, including removal of the requirement for exportable power, identified since 2009 as a key requirement (see Table 2.1 and paragraphs 2.16–2.17).

Table 5.1: Defence acquisition contract with Thales, October 2015

Stage	Original Cost ($m)	%	Current Cost ($m)[b]	%
1. Engineering and Manufacturing Development	149.6	11.3	147.8	10.1
2. Low-Rate Initial Production	204.2	15.4	203.8	13.9
3. Full-Rate Production	862.7	64.9	839.1	57.4
Integral Computing System[a]	1.9	0.1	159.1	10.9
Out-turning Impact	110.1	8.3	113.3	7.7
Total	**$1328.5**	**100**	**1463.1**	**100**

Note a: The original costing for the Integral Computing System related only to specification and design. The full costing of the Integral Computing System was finalised in November 2017 (see paragraph 5.51), and was for hardware, software and installation.

Note b: Price basis for original cost: Budget 2015–16 Out-turned. Price basis for current cost: Budget 2018–19 out-turned. Table excludes GST.

Source: ANAO analysis of Defence documentation.

5.22 If Thales does not meet the key contracted milestones, Defence can:

- issue a direction under the schedule recovery provisions of the contract;
- exercise its rights to substituted performance;
- direct Thales to prepare and execute a remediation plan;
- withhold payment for certain milestones;
- claim liquidated damages; or
- terminate the contract in line with defined provisions.

Liquidated Damages

5.23 The contract gives Defence the option to seek liquidated damages from Thales if Thales fails to deliver nine specified milestones. These milestones cover significant project reviews and acceptance of certain vehicle batches. Defence has four months after a failure to decide whether to seek the liquidated damages, or to accept equivalent compensation from Thales.

Contractual off-ramps

5.24 The Hawkei acquisition contract contains a number of 'off-ramps' if Thales fails to achieve certain contractual events. These off-ramps can be exercised if Thales fails to:

- conduct a successful Reliability Growth Trial demonstrating compliance against the specification;
- demonstrate compliance with Stage 1 survivability requirements;
- complete key Stage 1 contractual activities such as the Critical Design Review, the Low-Rate Initial Production Readiness Review, the Functional Configuration Audit and Data Item Deliverables;
- complete Production Readiness Acceptance Testing verifying compliance against the specification;
- demonstrate compliance with Stage 2 survivability requirements; or

- complete key Stage 2 contractual activities such as the acceptance of Low-Rate Initial Production vehicles, the completion of the Full-Rate Production Readiness Review and Data Item Deliverables.

5.25 In late 2014, in the context of issuing a sole-source Request for Tender, Defence had noted that these off-ramps were among the key changes in its revised Acquisition Strategy.[76] The staged approach to acquisition and the off-ramps were also cited as value-for-money considerations when financial approvals for entering the commitments under the contract were given in 2014 and 2015, and in Defence's 2015 Second Pass advice to Government.

5.26 Other Defence records indicate that Defence did not consider how to use the off-ramps. The project office advised the April 2015 Capability Gate Review Board that:

> There is currently no definition of what commercial outcome would cause DMO [the Defence Materiel Organisation] to seek staged approvals, or disengage with Thales on this project.

5.27 Defence has not considered exercising the option to use a contractual off-ramp, and has not maintained the market knowledge (for example, through benchmarking) that would enable it to make appropriate comparisons to inform its judgement.

Post-Second Pass testing

5.28 Since the commencement of the acquisition contract in October 2015, Defence has continued its test and evaluation activities, notably:

- A user trial in February 2017.[77] The trial report identified issues relating to the pilot build state of the vehicle. The report also noted that the Hawkei demonstrated good handling, cross-country capability, fording ability, and A-frame towing ability.
- Two further landmine tests in March 2017, which were assessed as successful, and another two successful tests in mid-2018.[78]
- A successful airlift test by a Chinook helicopter in June 2017.
- Deployment of two vehicles to the Middle East in December 2017 for operational testing, followed by further testing in Afghanistan.[79]
- Sea trials on the Landing Helicopter Dock (LHD) during 2018.

Reliability targets

5.29 Vehicle reliability is a major part of the fundamental requirement for sustainability (see Table 2.1), but the most significant reliability testing was not conducted until after Second Pass. In 2015 Defence rated reliability as a medium risk (see paragraph 2.53). During Stage 1 of the Hawkei

76 Other aspects of the revised Acquisition Strategy are discussed at paragraph 4.1.

77 In late 2014, in order to develop the knowledge and experience of Australian test personnel for user trials, Defence had sent an observer to a user trial of the Joint Light Tactical Vehicle in Georgia, USA.

78 Thales advised the ANAO in November 2017 that, in the course of its development from 2009 to 2017, the Hawkei has been subjected to 17 landmine blast tests, eight side blasts and fragmentation tests, and a number of specific armour tests. Thales technical experts consider that testing against the DEF(AUST) 10275 standard for test-bed preparation and calibration—over and above the NATO standard for armoured protection—is the most difficult in the world to pass, thus leading to the best outcome for the vehicle occupants.

79 Further user trials are planned for 2019 as part of Initial Operational Test and Evaluation.

acquisition contract (2015–17), the project experienced problems in achieving the level of reliability required to enter Low-Rate Initial Production.

5.30 Reliability was a key subject during contract negotiations in 2015, because Thales had made changes to 28 Hawkei subsystems during the Hawkei Pilot Readiness Program, as the project moved from prototype stage towards production-readiness. In September 2015, the Commonwealth's lead negotiator for the acquisition contract reported that Thales had fallen behind its schedule and observed that:

> Whilst there are provisions in contract such as stop payment milestones and stage off-ramps in the event Thales fails to achieve acceptable reliability outcomes, the risk of test failure, non-achievement of desired reliability levels, or schedule delay is in my opinion higher than if Thales had undertaken the planned reliability testing prior to contract signature.

Reliability Growth Trials

5.31 The contract requires Thales to conduct a Reliability Growth Trial to provide evidence that the Hawkei vehicles:

a. have increased in reliability from completion of the MSA [Manufactured and Supported in Australia] Development Contract; and

b. indicate that there is an acceptable risk to the Contractor and Commonwealth that the reliability requirements will be successfully met in PRAT [Production Readiness and Acceptance Testing].

5.32 The contract states the Trial should:

- consist of at least 12 000 kilometres per vehicle;
- involve at least four vehicles and four trailers, including at least: two utility variants; one command variant; and one reconnaissance or liaison variant; and
- incur no more than seven critical failures and no more than a total of 48 critical and non-critical failures across all vehicles.[80]

5.33 The Reliability Growth Trial required each vehicle to complete 16 'missions', lasting 36 hours and totalling 750 kilometres each, which would be comprised of 225 kilometres driven on primary roads, 375 kilometres driven on secondary roads, and 150 kilometres driven cross-country.

5.34 During 2016 and early 2017, Thales worked on the contracted Reliability Growth Trial. The first series of tests was intended to give Thales the opportunity to prepare and resolve any initial problems that occurred, with the second series intended to be the formal trial against the contracted targets. The first series was conducted between July and December 2016, and the second began in November 2016. In January 2017, after less than half the distance required had been completed, the target for the number of critical failures had been exceeded, and the trial was halted.[81]

Defence and Thales decided to conduct a third series of reliability trials

5.35 After high-level discussions, Defence and Thales agreed to a six-week 'reset period', during which Thales would be able to implement engineering fixes, followed by a third series of reliability

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80 This scoring methodology replaced the scoring methodology used during the development contract (Mean Time Between Failures and Mean Time Between Critical Failures, see paragraph 2.32), but the specification still includes Mean Time Between Failures and Mean Time Between Critical Failures.

81 For definitions of critical failure and essential function failure, see footnote 22.

trials, which Thales would be required to successfully complete in order to exit Stage 1 of the contract. Defence noted that the critical failures experienced included 'both random and recurring faults on the vehicle, with key root causes identified including supplier quality issues and immature components.' Defence assessed, however, that the vehicle architecture was fundamentally sound, and that 'there are no major concerns with the vehicle's ability to ultimately achieve design and manufacturing maturity.'

5.36 On 1 March 2017, the project advised the Defence senior leadership that the additional series of reliability trials would entail a three-month extension to Stage 1 of the Hawkei acquisition, and would lead to a budget slippage of approximately $28 million into financial year 2017–18.

5.37 In April 2017, Defence and Thales amended the contract to include the third series of reliability trials. The completion dates for Low-Rate Initial Production and Full-Rate Production were delayed by three months, to September 2018 and February 2021 respectively. In compensation for the delay, Thales agreed to provide superior armour and additional Integral Computing System screens, to an estimated value of $4 million. Some test requirements were dropped. The third reliability trial commenced on 5 May 2017.

5.38 On 14 July 2017, Defence provided Thales with interim results. The results exceeded both the number of allowable critical failures and the number of allowable essential function failures, and the Hawkei did not successfully complete the third series of reliability trials. Defence advised Thales:

> If schedule is to be maintained, then a method is required to remediate, prove and implement reliability improvements concurrent with existing production plans. Thales is required to submit Remediation Plans to address all scored CFs [critical failures] and EFFs [essential function failures]. This will support a Commonwealth assessment on the status of residual reliability design risk for the Hawkei Mission System, against contracted reliability levels.
>
> The Remediation Plans will require associated design review, schedule and risk assessments, a method to verify by demonstration the reliability improvement, and the identification of when improved designs will be reflected in Low Rate Initial Production (LRIP) vehicles.

5.39 The Thales Reliability Remediation Plan proposed to delay the Production Reliability Acceptance Test (previously scheduled for June 2017–April 2018) until January–December 2018, concurrent with Low-Rate Initial Production. Defence has the right to terminate the test and direct Thales to produce a remediation plan if an excessive number of incidents or safety issues occurs.

5.40 In August 2017, Defence and Thales amended the contract to include a Reliability Demonstration Test. The completion dates for Low-Rate Initial Production and Full-Rate Production were delayed by a further four months, to January 2019 and June 2021 respectively. In compensation for the delay, and in lieu of the liquidated damages that Defence could have imposed, Thales provided a one-year extension of the vehicle warranty and a $3 million discount on materials costs. Thales will also be obliged to remediate vehicles produced during Low-Rate Initial Production to the final vehicle standard. Defence analysis is that the delay of the start of Full-Rate Production will not impact the achievement of Initial Operational Capability (scheduled for 2019) or Final Operational Capability (scheduled for 2023).

5.41 Further information on reliability is presented at paragraphs 5.57–5.80.

The Integral Computing System

5.42 The Integral Computing System is intended to host, on a single piece of hardware, virtualised interfaces for the various platform systems, ancillary mission systems and applications[82] that would previously have required individual hardware solutions. Figure 5.1 shows the cabin of an Army vehicle fitted with current equipment (left), and a Hawkei cabin fitted with the Integral Computing System (right).

5.43 Some of the expected benefits of the Integral Computing System are:

- a reduction in the size, weight and power consumption of systems to be fitted to the vehicle;
- a reduction in the amount of training required for vehicle operators due to a reduction in the complexity of the systems; and
- a reduction in the cost of integrating new systems in the future.

Figure 5.1: A vehicle cab before and after the Integral Computing System

Source: Thales.

5.44 As noted in paragraph 2.45, in early 2014 Defence decided that delivery of the Integral Computing System would be completed by Final Operational Capability (2023), when the full capability would be virtualised and integrated. The contract signed in October 2015, in accordance with the Defence acquisition strategy, provided for a series of contract changes to progressively implement the Integral Computing System. The first significant contract change was signed in February 2016, at a cost of up to $31.7 million, incorporating agreed prices with all except one subcontractor. Defence advised the ANAO in December 2017 that the core Integral Computing System—inclusive of all hardware, operating software, and the Battle Management System—is included on Low-Rate Initial Production vehicles (currently being produced).

Progress with the development of the Integral Computing System

5.45 The Integral Computing System is being developed in four stages:

- **Stage 1** (August to December 2015) established the system requirements and the related development proposal. Thales was to engage with third-party companies to establish

82 The hosted applications are divided into core applications, consisting of platform monitoring, power monitoring, video monitoring, technical manuals, a system manager, and intercom control; and ancillary mission system applications, consisting of the Battle Management System, the Remote Weapon Station control software, joint fire control software, and external communications management.

agreements covering support, information and integration of third-party subsystems in the subsequent stages.

- **Stage 2** (January 2016 to September 2017) saw the design and development of the hardware and the integration of the core third-party software and hardware components. This stage also involved verification and validation of this initial product, and the provision of a vehicle fitted with a development version of the Integral Computing System for the User Trial in February 2017.
- **Stage 3** (January 2017 to July 2018) requires Thales to integrate the remaining components of the Integral Computing System, provide support to the achievement of technical certification, and conduct verification and validation of the final design.
- **Stage 4** (to be completed by 2023) involves an update of the Integral Computing System (largely software) into the vehicles, and any insertion of additional capabilities.

5.46 Thales is the prime systems integrator for the Integral Computing System, and is managing several subcontracts with third parties that are delivering specialist subsystems to be integrated with, and hosted on, the Integral Computing System. The third parties include Elbit, Kongsberg, Raytheon and Rockwell Collins.

5.47 Key technical reviews of the Integral Computing System have included:

- a Detailed Design Review in November 2016;
- an external review of compliance with the UK Generic Vehicle Architecture in January 2017; and
- a Critical Design Review in March 2017, which resulted in action items and approval of Integral Computing System entry into Low-Rate Initial Production.

Integration of the Battle Management System into the Integral Computing System was delayed by negotiations

5.48 The February 2016 contract change to include the Integral Computing System in the contract incorporated agreed prices for all proposed subcontractors except Elbit Systems of Australia (Elbit), the maker of Defence's Battle Management System. Thales and Elbit engaged in negotiations to reach a mutually acceptable solution for integrating the Battle Management System into the Integral Computing System. Defence monitored and participated in these negotiations.

5.49 A Contract Change Proposal for $8 million was presented by Thales to Defence in July 2016. However, this amount exceeded the cost-cap for Integral Computing System subcontractors, and further negotiations took place until the contract change was eventually signed at the original proposed cost in September 2016.

5.50 Defence records indicate that the difficulties encountered in this process led to 'a prolonged schedule and increased cost estimates' for the development of the Integral Computing System.

5.51 A contract change for the purchase of Integral Computing System hardware for the Low-Rate Initial Production phase was the subject of a rolling series of delays from January to November 2017. According to Defence internal reporting in August 2017, this contract change was expected to cost over $100 million, and Thales over-runs on their cost base forecasts were raising concerns about the exhaustion of technical contingency funding. The contract change was signed on 29 November 2017, to a value of $103.8 million (Budget 2017–18, Ex GST), effectively incorporating the procurement of the Integral Computing System into the acquisition contract for installation into

all vehicles from Low-Rate Initial Production onward. The contract change also increased the cost-cap for the Integral Computing System, and amended the mix of vehicle variants from 3 four-door variants to one baseline four-door variant with mission kits for the three roles of Command, Liaison and Reconnaissance (there is also a two-door Utility variant).

Metrics to assess Integral Computing System progress

5.52 As discussed in paragraph 5.10, the May 2016 Gate Review recommended that Defence develop a set of performance metrics to measure the progress of the Integral Computing System.

5.53 After this recommendation, two new positions to increase domain expertise were created in Defence's project office. The new staff reviewed the project's Integral Computing System management and reporting arrangements, and concluded that 'the [project office] has sufficient visibility of achievement against the Software Management Plan (SMP) via regular project progress meetings, and data item deliverables including the monthly dashboard' and that this visibility exceeds that obtained by other software-intensive projects in Defence.

5.54 Defence advised the ANAO in October 2017 that integration of the vehicle baseline and the Integral Computing System baseline has been a major task for the project, affected by some fluidity between the two production baselines and challenges experienced by Thales in obtaining pricing information from key suppliers. The ANAO has previously observed that cost and schedule risks tend to rise when acquisition programs reach the complex stage of systems integration, and Defence will need to maintain a focus on managing the remaining integration issues.[83]

5.55 With respect to the issues discussed in paragraph 5.50, Defence advised the ANAO in August 2018 that:

> These issues have been addressed, and the ICS capability is being delivered in accordance with the broader project schedule. The Integral Computing System is fully operational at Baseline Performance (Stage 1), proven on 31 Jul 17 (as per previous evidence). This includes Communications, Situational Awareness, Vehicle Systems, and Remote Weapon Station operation. There is further integration for addition of systems such as the Digital Terminal Control System.

Delays to Integral Computing System milestones

5.56 In November 2017, Thales informed Defence that the agreed milestones for achievement of the Integral Computing System Functional and Physical Configuration Audits, scheduled for February 2018, were unachievable. In January 2018, Thales advised Defence that it estimated achievement of the Functional and Physical Configuration Audit milestones would be delayed from February 2018 until June 2018 at the earliest. In February 2018, Thales advised the Commonwealth that, prior to the conduct of the Functional and Physical Configuration Audits, Design Approval Certification would need to be completed. Thales advised that this was scheduled to occur by the end of April 2018. Thales also noted that Integral Computing System hard drives issued with initial production vehicles would have reduced functionality, and that it expected to remediate these issues by April 2018. The Functional and Physical Configuration Audits were held at the end of June 2018, when Defence advised Thales that:

> there has been significant improvement in assembly of the 30 vehicles to date and [Defence] looks forward to the continual improvement and the closure of PCA [the Physical Configuration Audit] in the near future.

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83 Auditor-General Report No.52 2014–15, *Australian Defence Force's Medium and Heavy Vehicle Fleet Replacement (Land 121 Phase 3B)*, paragraph 5.15.

Conditional entry into Low-Rate Initial Production

Critical Design Review

5.57 Defence and Thales conducted a Critical Design Review on 18–20 July 2017.[84] This review generated 11 action items, two of which were closed the same day. The other nine action items included an HVAC remediation plan, the Reliability Remediation Plan (see paragraph 5.39), and pursuit of Australian Design Rules compliance. Under the contract, all major action items from this Critical Design Review were to be successfully addressed before the program could conduct the Low-Rate Initial Production Readiness Review, which was conducted on 20–21 July 2017.

Production Readiness Review

5.58 Defence's contract with Thales required the conduct of a Production Readiness Review before Thales could begin Low-Rate Initial Production of the Hawkei. This Readiness Review, which had specific entry and exit criteria, is a key milestone that marked the transition from the design of the Hawkei to the production phases of the project.

5.59 Defence granted Thales conditional entry into the Production Readiness Review notwithstanding:

- ongoing reliability issues;
- lack of evidence from Thales of the Manufacturing Readiness Level 7 requirements, which was the level required to support pilot production of the first six vehicles for Low-Rate Initial Production; and
- lack of a baseline vehicle for assessment and approval.

5.60 Defence agreed to commence production on the understanding that Thales would finalise and gain approval for a Reliability Remediation Plan and demonstration that previous reliability failures have been satisfactorily addressed.

5.61 The Production Readiness Review minutes show that nine mandatory criteria for exiting the review were considered. Of these, five were agreed, and four were agreed with caveats covering the future integration of the Integral Computing System, the acknowledgement of schedule risk, the draft status of review minutes and that entry into production was conditional on the closure of a major action item from the July Critical Design Review.

5.62 The acquisition contract contains two additional exit criteria, which are not recorded in the Production Readiness Review minutes as having been considered:

- The Hawkei baseline has been approved by Thales and Defence and is suitable for progression to the next phase.
- Corrective action plans have been documented for all minor action items from the Critical Design Review and assigned with agreed closure dates.

5.63 At the conclusion of the Production Readiness Review, Defence highlighted its key concerns, including: schedule risk; the significant amount of work required to completely integrate the vehicle and the Integral Computing System; and any design changes that need to be undertaken to remediate reliability.

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84 This was the sixth in a series of Critical Design Reviews conducted during 2017.

5.64 Both parties agreed that although approval to proceed was being granted, this was conditional on Thales providing plans to remediate reliability issues and demonstrate that previous reliability failures have been satisfactorily addressed.[85]

5.65 Thales presented its Reliability Remediation Plan to Defence on 2 August 2017 (see paragraph 5.39). The plan suggested that, as a first step, Defence approve the entry of the Hawkei into Low-Rate Initial Production. Thales would then commence a remediation program seeking solutions to each of the identified reliability failures, followed by the conduct of a Reliability Demonstration Test which would verify that the problems had been remediated.

5.66 The Thales Reliability Remediation Plan noted that the purpose of the Reliability Demonstration Test was purely to verify the suitability of fixes to the critical failures and essential function failures that occurred during the conduct of the third Reliability Growth Trial 'and therefore any issues outside of the CF [critical failures] and EFFs [essential function failures] will not be scored as part of the DT [Reliability Demonstration Test]'. The Reliability Demonstration Test was scheduled for September–December 2017, and commenced on 9 October.

5.67 Defence also advised Thales in September 2017 that:

> the delay in achieving Hawkei design maturity, and likely impact of CCP050 [Contract Change Proposal 050, in relation to the Reliability Demonstration Test], has adversely impacted the development of Support System deliverables in accordance with the current schedule. [...] it is incumbent on both parties to address these ILS [Integrated Logistics Support] issues as soon as practicable, to ensure that there is no detriment to delivery of the full capability to Army next year.[86]

5.68 Defence gave formal approval for the Hawkei to enter Low-Rate Initial Production on 11 August 2017.[87] Further, Defence provided Thales with a Final Acceptance Certificate for the Engineering and Manufacturing Development stage of the contract on 5 September 2017, noting that Thales' obligations in respect of the reliability issues would continue. Defence reserved its rights under the contract, and withheld the $43 million Stage 1 Performance Security Deed from Thales for up to six months, pending the resolution of reliability issues.

5.69 On 1 December 2017 Defence advised the ANAO that:

> Defence accepts that it has entered Low-Rate Initial Production without retiring risk to the extent that it had planned but considers that it has implemented an appropriate strategy for managing that risk with commensurate compensation from Thales.

85 In 2015, the ANAO made this recommendation:

> To reduce risk and assist the transition of capability from the acquisition phase to operations, the ANAO recommends that prior to System Acceptance, Defence ensures that material deficiencies and defects are identified and documented, and plans for their remediation established.

Auditor-General Report No.9 2015–16, *Test and Evaluation of Major Defence Equipment Acquisitions*, p. 51.

86 In December 2017, completion of the Detailed Design Review for the Support System was postponed from October 2017 to March 2018, aligning this deliverable with the schedule as revised in respect of reliability.

87 On 1 August 2017, to assist Defence before decisions on Low-Rate Initial Production, the ANAO advised Defence of the ANAO's preliminary finding that the Hawkei did not appear to represent value for money when compared to the Joint Light Tactical Vehicle.

Omission of highlighted text from public report required by certificate of the Attorney-General.

Reliability Demonstration Test and Design Approval

5.70 On 8 December 2017, Defence and Thales agreed to suspend the Reliability Demonstration Test, because 'a number of critical failures' had been identified, including 'engine integration issues'.

5.71 Defence informed Thales in January 2018 that:

> Due to acceptance testing not being completed, and known defects yet to be fully remediated, Commonwealth intent is that all production vehicles will be categorised as Restricted Use. Each vehicle will remain Restricted Use until such time that:
>
> a. Acceptance testing (including ICS) is completed and the System Acceptance Audit has been successfully exited; and
>
> b. All known defects have been remediated to the satisfaction of the Commonwealth.

5.72 Also in January 2018, Thales advised the Commonwealth of a number of non-compliances against the vehicle specification. The project office is to negotiate these issues with Army.

5.73 Thales provided design approval for the Hawkei vehicle in March 2018, with a number of known deficiencies and a plan for rework. Similarly, Elbit provided design approval for use of the Battle Management System element of the Integral Computing System. Defence granted preliminary design acceptance of the Hawkei for use in training and project activities.[88]

5.74 The Reliability Demonstration Test recommenced in March 2018, following the conduct of a Development Activity to identify and implement fixes. In previous reliability testing (see paragraph 5.32), a specific number of critical failures (seven) was set as a pass/fail criterion. In the Reliability Demonstration Test, only a critical engine failure (regardless of any other critical failures) would prevent entry into the Production Reliability Acceptance Test. The Reliability Demonstration Test ended in July 2018, with two vehicles each completing 12 000 kilometres, without the occurrence of a critical engine failure. On this basis, the test was successful. Thales is required to rectify all existing critical failures, identified during the various reliability testing cycles, before the start of the Production Reliability Acceptance Test.

5.75 Defence advised the ANAO on 23 August 2018 that:

> Two vehicles completed 12,000 km each on 4 Jul 18. Each vehicle is now being subjected to an additional 4,000 km with a 'wet' mission profile (fording) to demonstrate the remediation of vehicle wiring harness issues. As at 15 Aug 18, 17 Critical Failures were identified on the Reliability Demonstration Trial. No new critical failures relating to the engine have occurred. It is planned that the final reliability outcomes (including the final determination of Critical Failures) will be available two weeks after the completion of the 'wet' mission profile, currently planned for Sep 18.

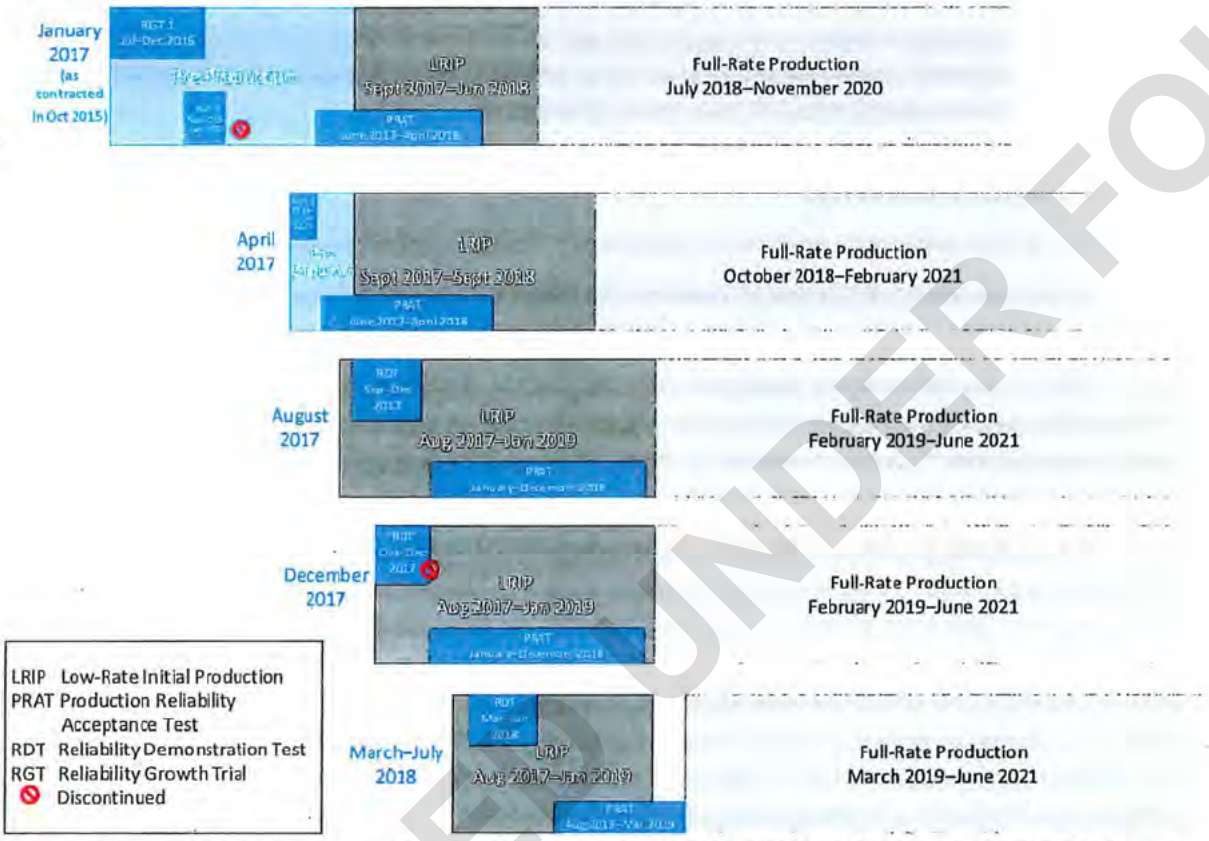
5.76 At a meeting of the Defence–Thales Strategic Relationship Board in March 2018, Defence stressed that 'the ongoing Hawkei reliability problems were a concern'. The schedule pressures built into the project (see paragraphs 4.24–4.32), together with the recent reliability issues, have resulted in contract schedule changes during 2017–18 as shown in Figure 5.2. Defence has observed, in the context of the 10 July 2018 Gate Review, that:

> Over the past 18 months the schedule 'float' between the contract and MAA [Materiel Acquisition Agreement] schedules has reduced from approximately six months, to one and two months for

88 A trial training course was held for Hawkei vehicle operators in March 2018, using vehicles delivered to the contracted instructors the previous week. Due to a number of deficiencies, a second trial training course was scheduled for July–August 2018 to finalise the course content for Army personnel.

IOC [Initial Operational Capability] and FOC [Final Operational Capability], respectively. The critical path to IOC remains primarily dependent upon the successful completion of PRAT [Production Reliability Acceptance Test].

Figure 5.2: Contract schedule changes during 2017–18



Note: These schedule changes are discussed in paragraphs 5.37 (April 2017), 5.40 (August 2017), 5.70 (December 2017, not yet contracted), 5.74 and 5.80 (March–July 2018, not yet contracted).

Source: ANAO analysis of Defence documentation.

5.77 Due to the extended Reliability Demonstration Test, the Production Reliability Acceptance Test has been further delayed. It is now planned to be conducted over eight (rather than eleven) months, from August 2018 to March 2019, fourteen months later than originally scheduled (see paragraph 5.39). The test will use eight vehicles instead of four, so that the test can be completed in the shorter timeframe required by the revised schedule. This testing is to present a greater challenge for the vehicles, six of them having to complete 32 000 kilometres, with trailers attached for half of that distance, and two other vehicles completing other testing.

5.78 The project office was required to undergo a further Gate Review (see paragraph 5.17) prior to entering the Production Reliability Acceptance Test, to provide confidence that the reliability issues have been resolved. This review occurred on 10 July 2018. Defence advised the review board that:

> Testing in both Stage 1 and recently under Stage 2 has confirmed significant progress in the past 18–24 months in a number of key areas of vehicle performance. [...] While these issues [a number of performance non-compliances] continue to be progressed, the Project considers that the fundamental architecture of the vehicle platform is sound and remains confident in the vehicle's ability to ultimately achieve design and manufacturing maturity.

The vehicles are now in their sixth cycle of reliability failure–redesign–retest but the results to date remain well below the requirement. Despite more than seven years of development the vehicle has not yet achieved the required level of reliability which has been significantly reduced during the period.

5.79 Defence also noted that the project 'is not a Project of Concern, but is a Project of Interest to senior management within Defence and Thales'. The review board concluded that there is now a reasonable prospect of the successful completion of the Production Reliability Acceptance Test.

5.80 The project office has informed Thales that Full-Rate Production will not commence until the Production Reliability Acceptance Test is completed. Thales proposes to commence a Reduced Production Period in November–December 2018, and has committed to bear the associated contractual risk and any vehicle rework costs from this course of action. In July 2018, Thales submitted a third draft of the contract change to align the contract with the amended Reliability Remediation Plan and incorporate the Reduced Production Period.

5.81 Defence has accepted the first production vehicles, after resolution of some quality issues and achievement of Australian Design Rules compliance. By 30 June 2018, Defence had accepted 20 vehicles and 20 trailers.

Grant Hehir
Auditor-General

Canberra ACT
6 September 2018

Appendices

Appendix 1 Department of Defence response

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Australian Government
Department of Defence

Mr Greg Moriarty
Secretary

General Angus J. Campbell, AO, DSC
Chief of the Defence Force

SEC/OUT/2018/264
CDF/OUT/2018/592

Mr Grant Hehir
Auditor-General
PO Box 707
Canberra ACT 2601

DEPARTMENT OF DEFENCE RESPONSE – ANAO FOURTH REVISED DRAFT FINAL REPORT: *ARMY'S PROTECTED MOBILITY VEHICLE – LIGHT*

Dear Mr Hehir

Thank you for your correspondence on 2 August 2018, which contained the Fourth Revised Draft Final and Confidential Report for the ANAO performance audit *Hawkei – Army's Protected Mobility Vehicle-Light.*

Defence acknowledges the changes made to the previous draft report and appreciates the opportunity to review and provide further commentary on the final and confidential report.

Defence notes the findings of the draft final and confidential report. The identified Key Learnings are acknowledged and will support Defence's approach to capability acquisition.

However, Defence does not agree with the ANAO's conclusion that Defence has not clearly demonstrated that the acquisition of the Hawkei provides a value for money result for the Commonwealth. Defence considers that the ANAO's analysis is too simplistic and that a more holistic approach to the value for money analysis would present a more accurate depiction of the acquisition and its capability. [1]

Value for money decisions are based on both financial and non-financial benefits in accordance with the Commonwealth Procurement Rules.[2] The overall value for money proposition of the acquisition was based on the following factors:

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Defending Australia and its National Interests

- The Hawkei is a leading edge protected vehicle with a Thales-designed integral computing system;
- The resultant Australian industry capability is able to provide flexible support for and adaptive development of the capability to protect soldiers on operations over its life;
- The intellectual property rights are retained by the Commonwealth and there are potential financial benefits from future overseas sales of the vehicle; and
- With the release of the 2018 Defence Industrial Capability Plan, the Hawkei Protected Mobility Vehicle is a Sovereign Industrial Capability within the '*Land Combat Vehicle Technology Upgrade*' priority.[3]

The value for money assessment for this project was made by Government at Second Pass.[4] While some delays were incurred, the project continues to operate within the capability, budget and schedule parameters approved by Government.[5]

Defence also disagrees with ANAO's assertion that as a result of the decision to delay the 2017 Gate Review, the project entered Low Rate Initial Production without the appropriate level of scrutiny. This decision was made with the appropriate level of senior management oversight and the two subsequent Gate Reviews did not raise concerns regarding this decision.

Defence maintains that the Hawkei provides Australia with a domestically developed and sovereign capability that can be modified to meet emerging threats and protect Australian Defence Force personnel. Thales Australia and the Commonwealth are engaged in ongoing joint efforts to market this capability internationally to our security partners. Defence is confident that the Hawkei will be able to be modified to meet the requirements of our security partners and provide these nations with a highly effective capability.

Attached to this letter are Defence's proposed amendments, editorials and comments (Annex A). This constitutes Defence's formal response to both versions of the final report.

Defence remains committed to assisting you with the successful completion of this performance audit.

Yours sincerely

Greg Moriarty
Secretary

15 August 2018

General Angus J. Campbell, AO, DSC
Chief of the Defence Force

15 August 2018

ANAO comments on Defence's formal response

(See the reference numbers on the previous pages)

1. The audit objective was to assess the effectiveness and value for money of this acquisition. The ANAO's conclusion against the audit objective, as set out in paragraphs 10 to 14, addresses key considerations necessary to assess the project's effectiveness and value for money. These considerations include capability, cost, governance, risk management, requirements definition, schedule, government's industry objectives, and price. The ANAO's assessment was holistic and did not focus exclusively on cost.

This audit report also contains an analysis (at paragraphs 4.48 to 4.53 of the report) of publicly available information which was undertaken by the ANAO to demonstrate that benchmarking as a component of assessing the achievement of value for money in this $2 billion sole-source procurement was indeed possible, in the absence of benchmarking against a comparator vehicle continuing to be undertaken by Defence.

The analysis is demonstrative and was heavily caveated to ensure a reasonable—and perhaps generous—basis for comparison between the per-unit cost of the Hawkei vehicle being acquired by Defence and the publicly reported cost of the Joint Light Tactical Vehicle (JLTV) to be procured by the United States and the United Kingdom pending negotiations. The analysis was additional to the evidence remaining in the report (following the Attorney-General's certificate) that Defence has not adequately benchmarked its sole-source acquisition as part of demonstrating—and thereby assuring the Government and Parliament—that its contract with Thales Australia would achieve value for money.

The evidence indicates that the Government decided to accept an estimated price premium of 23 percent for the Hawkei in comparison to the JLTV, largely on the basis of capability considerations. Government and the Parliament can reasonably expect that Defence informs itself as to whether a procurement stays within the parameters, relating to both price and capability, set by the Government.

2. Non-financial benefits, as advised by Defence, are included in paragraphs 29 and 4.56–4.57 of this audit report.

3. The *Defence Industrial Capability Plan* was released in April 2018 and could not have informed the Government's August 2015 Second Pass decisions.

4. Defence's August 2015 advice to the Government at Second Pass is discussed in paragraphs 4.33–4.35 and Table 4.1 of this audit report. Defence's post-Second Pass (October 2015) value-for-money assessment of the acquisition contract is discussed in paragraph 4.41.

5. The conclusion of this audit report states that the project remains within the government-approved and contracted budget and scope, but reliability issues have led to schedule delays (see paragraph 14).

Appendix 2 Thales Australia Limited response

THALES

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20 August 2018

Mr Grant Hehir
Auditor-General
Australian National Audit Office
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Barton ACT 2603

Email: Grant.Hehir@anao.gov.au

Dear Mr Hehir

Thales Australia response to ANAO Report on Army's PMV-L Acquisition

Thales Australia received only highly redacted extracts from the ANAO Report on Army's PMV-L acquisition, limiting our ability to comment to the following.

Hawkei provides life-saving capability to the ADF in a vehicle designed and manufactured in Australia. It is disappointing that the ANAO places zero value on the maintenance of a life-saving defence industry capability in Australia; zero value on Australian content and zero value on Australian jobs.[1]

By way of context, it is worth noting that the ANAO was highly critical of the Bushmaster protected vehicle program. The Bushmaster, designed and manufactured by Thales Australia at Bendigo, proved to be a life-saver for Australian forces in Iraq and Afghanistan due to the level of protection it provides against roadside bombs. A large number of Bushmaster vehicles were destroyed by roadside bombs in Iraq and Afghanistan but not one Australian soldier was killed in any of these blasts. By contrast, thousands of troops from Coalition partners, notably the USA, were killed in their vehicles by roadside bombs.[2]

Importantly, the examination of Bushmaster vehicles damaged or destroyed by roadside bombs allowed the vehicle to be upgraded over the course of the Afghanistan conflict, using the lessons learned to improve the protection levels of the vehicle, either in later build versions or through retrofitting or adaptation of existing vehicles. There is no doubt that the deep engineering capability developed through an Australian design, manufacture and vehicle upgrade program saved lives. This critical sovereign capability has been maintained and enhanced in the Hawkei program and will continue through the life of the platform.

The strategic value of Army vehicle design, engineering and manufacturing in Australia has been recognised through its inclusion as one of ten Sovereign Industry Capabilities announced in the Defence Industry Capability Plan in May 2018.[3] The failure of the ANAO to recognise the value of Australia's capability to modify and adapt to the threat evolution that Australian forces have experienced so recently, raises the question 'Is the ANAO at all aware of what our forces have been doing in theatre for the past decade?'.[4]

The ANAO assessment also ignores the broader economic benefit from the vehicle design, development and manufacture in Australia.[5] For example it places zero value on:

- The 200 jobs at the Thales Australia Protected Vehicle facility in Bendigo in the Hawkei program;
- A further 200 jobs in the 22 Australian SMEs that are Tier 1 suppliers in the Hawkei supply chain. During a period when the Australian car manufacturing industry has been progressively shut down, the ramp up of work on the Hawkei has seen Thales and its suppliers employ a number of people out of the vehicle manufacturing sector and they in turn have brought advanced manufacturing skills to the Hawkei production team.
- Australian Industry Content of at least 55% in the Hawkei production, or more than $650m;
- The $110 million in development spending on the Hawkei spent on an Australian vehicle;
- The broader benefits to Army of the development of the Hawkei Integral Computing System which can be adopted across other vehicle fleets with minimal additional costs, thus representing considerable savings to the ADF.

There will be increased economic benefits for Australia through the Hawkei supply chain from export sales. Bushmaster has already been exported to seven countries.[6] Thales Australia is currently pursuing export opportunities for both Hawkei and Bushmaster in a number of countries, with strong support from the Australian government. The Commonwealth, as an owner of IP in the Hawkei, will receive royalty payments on every Hawkei vehicle that is exported. The ANAO report takes no account of the value of export sales and the report's flawed analysis is likely to be extremely damaging to export prospects. Schedule One to this letter sets out those flaws in the analysis and how they may be improved to clarify the true position.[7]

The ANAO makes selective comparisons with the US Joint Light Tactical Vehicle (JLTV) program but ignores the most recent performance audit of the JLTV by the US Dept of Defence Inspector General.[8] This audit report, released in May 2018, found that the US Army and Marine Corps "have not demonstrated effective test results to prepare the JLTV program for full rate production". The audit reviewed eight performance requirements for the JLTV including Operational Availability, Mean Miles Between Operational Mission Failure and Mean Miles Between Essential Function Failure, and found the JLTV failed to meet the threshold requirement for a number of these performance requirements, although heavy redactions in the report make it impossible to identify which performance requirements were failed.

Finally, the ANAO analysis ignores defence policy settings. In April 2016 the Defence White Paper and the Defence Industry Policy Statement marked a profound policy shift with, for the first time, Australian defence industry declared to be a Fundamental Input to Defence Capability. At the time, Prime Minister Malcolm Turnbull declared:

"I am determined that every dollar we spend on defence procurement as far as possible should be spent in Australia".

The Defence Industry Capability Plan released in May 2018 reinforced the priority on Australian content and detailed ten priority Sovereign Industry Capabilities, including Army Combat Vehicles and Technology Upgrades. The Land 121-Phase 4 acquisition of Hawkei as the Army's Protected Mobility Vehicle – Light is entirely consistent with these policy positions, and is delivering world-leading capability that has been designed, developed and manufactured in Australia, maintaining a life-saving industrial capability in this country.

Yours sincerely

CHRIS JENKINS
Chief Executive Officer
Thales Australia & NZ

SCHEDULE ONE

Paragraph 2.16

We propose the addition of the following additional paragraph beneath paragraph 2.16:

> *During the delivery of any major, complex project there are always "overs and unders" (reflective of the necessarily predictive nature of the projected work contained in a proposal or contract) in the cost of components compared to the contract forecast. The price of the exportable power units is now significantly lower than forecast, whereas other supplies have become more expensive. Removing the exportable power requirement logically means removing the actual cost of the units ($16m) not the forecast cost.*

Paragraph 4.56

We propose the addition of the following additional paragraph beneath paragraph 4.56:

> *In May 2018 the Government released the Defence Industry Capability Plan detailing for the first time ten Sovereign Industrial Capabilities to enable the ADF to access and maintain essential skills, technology, intellectual property, financial resources and infrastructure within Australia's defence industrial base. Land combat vehicle and upgrades technology is included as one of the ten Sovereign Industrial Capabilities, with the policy stating that Australian industry must have the capability and capacity to design, develop, manufacture and integrate new systems.*
>
> *The Hawkei program maintains in Australia the life-saving capability in protected vehicle design, engineering, manufacturing and upgrade established through the Bushmaster program. As such it plays a lead role in delivering one of the ten Sovereign Industrial Capabilities.*
>
> *Further, maximising Australian content is a clear objective of the Government and Defence policy. The Hawkei program has Australian Industry Content of more than 55%, employs 200 people in Bendigo at Thales Australia's protected vehicle manufacturing facility and supports another 200 jobs at Australian SMEs through the vehicle's supply chain.*

Paragraph 4.57

We propose the addition of the following additional paragraph beneath paragraph 4.57:

> *Since this estimate was made in 2015 the specifications of the JLTV and the Hawkei have diverged significantly such that it can no longer be a reliable estimate. The cost of adapting the JLTV to the specific Australian requirements in the Hawkei would be significant.*

Chapter 5 – Governance and contracting arrangements

We refer to the blue box and the text beneath the heading 'Key findings'. We propose that the ANAO insert the words underlined as included in the quoted text below:

> *The project remains within the contracted budget and scope and has successfully passed the Reliability Demonstration Test, but with some schedule delays.*

Paragraph 5.9

We suggest that the ANAO delete the text of footnote 71 and replace with the text set out below:

> *Thales rejects any suggestion that undue pressure has been brought to bear. On the Hawkei project the focus of the Thales and Defence project teams has been on achieving successful delivery. The working relationship has been characterised by transparency and collaboration, evidenced by the constructive way project challenges have been overcome in order to deliver the 'best vehicle of its type in the world, and made in Australia', according to Maj Gen Gus McLachlan, Forces Commander Australian Army, 24-11-17.*[10]

Table 5.1

In its current form the table is misleading in its treatment of the Integral Computing System. The amount of $1.9m corresponding to the 'Original Cost' of the Integral Computer System in the October 2015 contract only covered specification and design and not actual construction and delivery. The amount of $158.3m corresponding to the 'Current Cost' corresponding to the Integral Computer System includes the ICS hardware, software and installation. It is misleading to suggest the total cost of the ICS has increased from $1.9m to $158.3m as the table implies.[11]

We propose that a fairer comparison of the 'Original Cost' and the 'Current Cost' of the Integral Computing System would be achieved by deleting the line items corresponding to the Integral Computing System and inserting a new table as set out below underneath the following heading:

The total cost of the Integral Computing System was finalised in November 2017

	2015 Contract ($m)	*Current Contract ($m)*
Integral Computing System *- Specification and Design*	*1.9*	
Integral Computing System *- Hardware, software and installation*		*158.3*

Paragraph 5.30

We propose the addition of the following additional paragraph beneath paragraph 5.30:

> *The transition from prototypes to production-readiness is significant, particularly in circumstances where specifications were being added or changed, the Commonwealth exerted very tight cost control, some suppliers were unable to supply to the spec or price required and some supplier parts had gone out of production. The ability of Thales, its suppliers and the project office to work successfully through all these issues has produced a better vehicle that has passed the Reliability Demonstration Test and is within budget.*

Paragraph 5.41

The paragraph as presently framed has been overtaken by events that have developed from November 2017. We set out below our proposed amended text:

> *Reliability testing is a normal part of the development of a new vehicle, particularly one required to meet high performance specifications. The series of Hawkei reliability trials provided valuable information to improve the vehicle that has been incorporated into the Low-Rate Initial Production build. In July 2018 two Hawkei vehicles successfully passed the Reliability Demonstration Trial (RDT) of 12,000km with no critical failures.*[12] *Thales Australia and Defence have worked closely during the reliability trials and the successful RDT provided further confidence that the vehicle architecture is sound and will achieve design and manufacturing maturity. Thales Australia remains absolutely committed to the Reliability Remediation Plan and has accepted a significant financial penalty.*
>
> *Thales also notes that the US Joint Light Tactical Vehicle has failed to meet performance requirements following a review by the Inspector General US Department of Defence. The May 2018 report found the Army and Marine Corps "have not demonstrated effective test results to prepare the JLTV for full rate production". The report notes that the JLTV has failed to meet the threshold for a number of performance requirements.*

Paragraph 5.42

We propose the following additional phrase, underlined in the excerpt set out below:

> *Further information on reliability, <u>including the successful completion of the Reliability Demonstration Test in July 2018</u> is presented at paragraphs 5.58 – 5.80.*

Paragraph 5.52

In respect of this paragraph we observe that the claim of an over-run on the cost base forecast is misleading. Additional scope was added (pursuant to a conventional contractual mechanism for changes to scope and corresponding changes to cost), adding to costs after the cost base forecast was submitted.

Paragraph 5.58

In respect of this paragraph we observe that the Critical Design Review extended over a six month period, involving multiple meetings and events. The ANAO comments relate only to the final CDR meeting not the whole process.[13]

Paragraph 5.75

We propose the deletion of the following sentence:

> *Unlike in previous reliability testing (see paragraph 5.32), no specific number of critical failures was set as a pass/fail criterion for the Reliability Demonstration Test, but any critical engine failure would prevent entry into the Production Reliability Acceptance Test.*

The reason that we propose the deletion of the sentence is that it is factually incorrect. One critical engine failure would have constituted a fail of the Reliability Demonstration Test, hence it is untrue to say that "no specific number of critical failures was set as a pass/fail criterion". Comparison of RDT to the Reliability Growth Trials, referenced in para 5.32, is also misleading as they are clearly separate stages of the test and evaluation process. This sentence should be deleted.[14]

Further in respect of this paragraph, we propose that the ANAO insert the words underlined as included in the quoted text below:

> *On this basis the test was successful, a key requirement to move into the Production Reliability Acceptance Test.*

We propose the addition of the following additional paragraph beneath paragraph 5.75:

> *The Reliability Demonstration Test involved two Hawkei vehicles completing 12 000km under gruelling conditions at the Monegeetta test facility, along with a fording test which involved the vehicle being submerged in 1.2m of water, the engine switched off for a period then restarted, and the whole process repeated. The two Hawkei vehicles passed the RDT with no critical failures.*[15]

ANAO comments on Thales Australia's formal response

(See the reference numbers on the previous pages)

1. The audit objective was to assess the effectiveness and value for money of this acquisition. The ANAO's conclusion against the audit objective, as set out in paragraphs 10 to 14, addresses key considerations necessary to assess the project's effectiveness and value for money. These considerations include capability, cost, governance, risk management, requirements definition, schedule, government's industry objectives, and price. The ANAO's assessment was holistic. See also note 4 below.

2. Auditor-General Report No.59 2003–04, *Defence's Project Bushranger: Acquisition of Infantry Mobility Vehicles*, was tabled on 30 June 2004 and made seven recommendations relating to Defence's contract management and assurance processes, which were agreed by Defence. This audit report of the procurement of Hawkei vehicles does not deal with Defence's original acquisition of Bushmaster vehicles. Paragraphs 3.43 to 3.45 of this audit report deal with the 2012 decision to acquire additional Bushmaster vehicles, to keep Thales' Bendigo facility open.

3. The *Defence Industrial Capability Plan* was released on 23 April 2018. It is discussed in paragraph 1.6 of this audit report.

4. Paragraph 1.2 of this audit report states that Defence's decision to acquire a fleet of protected vehicles was the result of lessons learned from Australian Defence Force operations since 1998.

5. Defence's economic impact study is discussed in Box 1 in Chapter 3. Non-financial benefits, as advised by Defence, are included in paragraphs 29 and 4.56–4.57 of this audit report.

6. Royalty payments to Defence are referenced at paragraph 2.51 of this audit report.

7. Notes 10–15 below summarise amendments to the audit report informed by Thales' comments of 20 August 2018.

8. The audit report reviews Defence's benchmarking against the United States Joint Light Tactical Vehicle because it was retained as a possible alternative option for Second Pass (see paragraphs 12, 27, 3.35, 3.38, 4.2, 4.13–4.15, 4.34–4.35 and Table 4.1 of this audit report).

9. The *Defence Industrial Capability Plan* was released in April 2018 and could not have informed the Government's August 2015 Second Pass decisions.

10. Inserted as footnote 71.

11. See note (a) of Table 5.1.

12. Paragraph 5.75 provides Defence's 23 August 2018 advice to the ANAO on the outcome of the Reliability Demonstration Test.

13. See footnote 84.

14. Text amended in paragraph 5.74.

15. See note 12 above.

Appendix 3 Elbit Systems of Australia response

Elbit Systems of Australia

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GDW-171204-1845

4 Dec 2017

Dr Patrick ONeill
Director
Defence Performance Audit Branch | Performance Audit
Australian National Audit Office
Tel: 02 6203 7556
www.anao.gov.au

Dear Dr ONeill,

RE: Australian National Audit Office audit of Protected Mobility Vehicle Light (PMV-L)

References:
A. Email ANAO Dr Patrick ONeill / Elbit Systems Dan Webster of 6 Nov 2017
B. Proposed Report under s.19 of the Auditor-General Act 1997 Army's Protected Mobility Vehicle Light (PMV-L) Extract for Elbit Systems of Australia, covering Paragraphs 5.51 to 5.53 of 06 Dec 2017
C. ANAO / Elbit Systems meeting at ANAO Office, Barton Canberra on Wed 29 Nov 2017

Initiated at Reference A, Elbit Systems was invited to review and respond to Reference B; which is an extract of the proposed ANAO report on Army's Protected Mobility Vehicle Light (PMV-L). At Reference C, context and a potential Elbit Systems response was discussed. This letter covers an introduction, facts around activity to reach a contract, and editorial comment regarding Reference B (Para 5.51 to 5.53).[1] Those paragraphs are referenced at Enclosure 1.

During the period in question, Elbit Systems was contracted to Electronic Systems Division of the Defence Materiel Office (DMO) under Land 75/125 to deliver Army's Battle Management System (BMS). The architecture for the BMS was defined by the Land 75/125 program (for which Elbit Systems is the Design Authority) and informed the installation designs for all other platforms. The program produces a homogenous command and control architecture presented as a common system in headquarters, vehicles, aircraft, landing craft and dismounted soldier systems. The BMS is now hosted on nearly all of the Army's existing platforms and in deployable headquarters. Elbit Systems is currently under contract to the Joint Systems Division of the Capability Acquisition and Sustainment Group (CASG) to continue the roll out of the BMS to additional platforms and organisations under Tranche 2 of Land 200.

The PMV-L Integral Computing System (ICS), developed by Thales Australia, adopted a "Virtualised" on-board architecture which is different to the "Integrated" on-board architecture delivered on other platforms through Land 75/125. Prior to the delivery of the ICS System Specification in Dec 2015, Elbit Systems, as the design authority for the overall BMS architecture for the Australian Army, had not been engaged in the development of the PMV-L ICS, nor involved in any assessment of its impact upon the rest of the BMS network or the flow on Integrated Logistic Support arrangements. It was not apparent

1

1 ANAO comment: This letter discusses paragraphs that are now numbered 5.48–5.50 in this audit report.

to Elbit Systems at the time, if the DMO Project Offices in Electronic Systems Division and Land Systems Division had de-conflicted the requirements or approaches. Despite this, Elbit Systems understands the importance of this vehicle project. All Elbit activity necessary to arrive at a mutually acceptable and executable Statement of Work (SOW) and contract has been self-funded. This included: internal preparation, technical validation and testing; attendance at numerous external engagements and design reviews held at Thales Australia, Elbit Systems and Customer facilities for local and, on occasion, international Elbit Systems staff.

On review of Reference B, Elbit Systems would like to clarify the timeline for the development of its subcontract with Thales Australia to host the BMS on the PMV-L ICS in order to bring the PMV-L into the Australian Army BMS network. Key maturity points are as follows:

- 23-Nov-2015. A meeting was held at Russell Offices between: HMSP-A, HLS, Thales Australia, and Elbit Systems to discuss alignment (Electronic Systems Division was not present at this meeting).
- 17-Dec-2015. Thales Australia provided on 17 Dec 2015 to Elbit Systems a version 1.1 of the C4I Integral Computing System (ICS) Specification for the PMV-L. Please note at this point of time there was no SOW provided to Elbit Systems to cover the proposed body of work.
- Feb-Mar 2016. Initial proposal work was conducted in Feb-Mar 2016. The maturity of the SOW was insufficient to facilitate progress to contract. Subsequently, several iterations of a draft SOW were circulated between the companies in order to develop a technically executable SOW.
- Apr-2016. As part of the iterative development of the SOW, in Apr 2016, Thales Australia informed Elbit Systems of a budget limit of AUD $4 million to constrain the BMS scope within the subcontract. Elbit Systems was also then requested to provide a resubmission that could be implemented within a 12 month schedule.
- 5-Aug-2016. Thales Australia issued a mature SOW on 5 Aug 2016. This SOW provided the appropriate basis for an estimate to be conducted in order for Elbit Systems to provide a commercial proposal. Once developed this was passed through Elbit Systems' formal approval processes.
- 8-Sep-2016. Contract signature was achieved on 8 Sep 2016; between Thales Australia and Elbit Systems (subcontractor).

To improve accuracy in the ANAO's proposed report, Elbit Systems would like to provide the additional editorial feedback regarding Reference B paragraphs 5.51 to 5.53:

- [Reference B Para 5.51, 5.52] The first opportunity for Elbit Systems to provide an acceptable proposal to Thales Australia occurred on 5 Aug 2016 when Elbit Systems received a mature SOW upon which to base the proposal. All efforts and proposal work prior to this milestone were based on assumptions made by Elbit Systems (in good faith) on incomplete information.
- [Ref B, Para 5.51] Elbit Systems had no involvement or insight into the Land 121 Phase 4 Contract Change Proposal (CCP) of Feb 2016. Please note - Elbit Systems was not formally contracted or commercially engaged in the development of this CCP, nor aware of Project Office constraints imposed upon in the structure of the CCP.

- [Reference B Para 5.53] Elbit Systems is not aware of any improvements to the BMS flowing from the Land 121 Phase 4 activity. The presentation of the Australian Army BMS in all of its other instances remains as it was defined in the Land 75/125 base line and is being continuously updated in Tranche 2 of Land 200. Pursuant to the contract between Thales Australia and Elbit Systems, referred to above, a platform specific implementation was developed to enable the BMS to be presented on the "Virtualised" PMV-L ICS architecture.

Elbit Systems wish to thank ANAO for the meeting of 29 Nov 2016 and the opportunity to provide this response to Reference B. Please contact me if you require any further assistance or clarification.

Regards,

Gary Wylde
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Email: gary.wylde@elbitsystems-au.com

Appendix 4 Phases of project Land 121

1. Defence began the process of replacing its General Service B Vehicle fleet in 1990, and initiated project Land 121 in 1992. The project phases were restructured in 1997, 1998, 2001, 2003 and 2007. The phases of project Land 121, as implemented, are shown in Table A.1.

Table A.1: Phases of project Land 121

Phase		Year approved	Cost ($m)
Phase 1	Project Definition Study	1994	2.0
Phase 2A	Urgent Capability Shortfalls	1999, 2001	90.1
Phase 2B	Urgent East Timor Capability Shortfalls	2000	20.0
Phase 3A	Light–Lightweight Capability Field Vehicles, Modules and Trailers [G-Wagons]	2011	1017.6
Phase 3B	Medium and Heavy Vehicles	2013	3364.0
Phase 4	Protected Mobility Vehicle–Light	2015	2237.1
Phase 5A	Combined with Phase 3A	2011	—
Phase 5B	Additional Medium and Heavy Vehicles	Not yet approved	Not yet approved

Source: ANAO analysis of Defence documentation:
Phases 1, 2A, 2B: *Phase 4, Option 2 – Next-Generation Acquisition Strategy*
Phase 3A: *Defence Annual Report 2016–17*, Web Table B.4.
Phase 3B: *Defence Annual Report 2016–17*, Web Table B.3.
Phase 4: see Table 1.1.
Phase 5A: Materiel Acquisition Agreement, 2016.
Phase 5B: Defence intranet.

Appendix 5 Attorney-General's certificate prohibiting public disclosure of parts of this audit report, 28 June 2018

~~PROTECTED~~
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The Hon Christian Porter MP
Attorney General

MS18-000916

Mr Grant Hehir
Auditor General for Australia
Australian National Audit Office
19 National Circuit
BARTON ACT 2600
Grant.hehir@anao.gov.au

28 JUN 2018

Dear ~~Mr Hehir~~ GH

I refer to my earlier correspondence about a request to me for the issuing of a certificate under s 37(1)(b) of the *Auditor-General Act 1997* (the Act) in relation to certain information contained in the ANAO's proposed performance audit report titled *Army's Protected Mobility Vehicle Light*.

I have considered the matter carefully and have decided that in my opinion disclosure of certain information contained in the audit report, identified in the attached Schedule, would be contrary to the public interest for one or both of the following reasons set out in s 37(2) of the Act:

- it would prejudice the security, defence or international relations of the Commonwealth (s 37(2)(a));
- it would unfairly prejudice the commercial interests of any body or person (s 37(2)(e)).

This letter and the attached Schedule together constitute my certificate for the purposes of s 37(1)(b) of the Act.

All references to the report in the Schedule are to the Draft Final Report dated 8 January 2018. I note that the draft audit report has been updated since that time. For clarity, the Schedule contains cross references to the relevant paragraphs in the Third Revised Draft Final Report dated 2 May 2018, which you provided to me on 9 May 2018.

Yours sincerely

The Hon Christian Porter MP
Attorney General

Parliament House, Canberra ACT 2600 • Telephone (02) 6277 7300 Fax (02) 6273 4102

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Schedule – information to be omitted from public report – *Army's Protected Mobility Vehicle – Light*

Information (Draft Final Report of 8 January 2018)	Information in Third Revised Draft Final Report (2 May 2018)[1]	Section 37(2) reason
Page 7, paragraph 4, second sentence	Page 6, paragraph 10, second sentence	s 37(2)(a) and s 37(2)(e)
Page 8, paragraph 7, final sentence	Page 7, paragraph 13, final sentence (text already redacted)	s 37(2)(a) and s 37(2)(e)
Page 10, paragraph 23, first and second sentences	Page 9, paragraph 29, first two sentences (text already redacted)	s 37(2)(a) and s 37(2)(e)
Page 12, the two paragraphs of the Defence response	Page 10, the second and third paragraphs of the Defence response[2]	s 37(2)(a) and s 37(2)(e)
Page 25, footnote 18, second and third sentences	Page 24, footnote 19 (the sentences have been removed)[3]	s 37(2)(a)
Page 42, first text box, final sentence under heading 'Conclusion'	Page 41, first text box, final sentence under heading 'Conclusion' (text already redacted)	s 37(2)(a) and s 37(2)(e)
Page 49, grey text box, paragraph 2, first and second sentences	Page 48, grey text box, paragraph 2, first and second sentences (text already redacted)	s 37(2)(a) and s 37(2)(e)
Page 50, paragraph 4.36, second sentence and footnote 51	Page 49, paragraph 4.36, third sentence and footnote 51	s 37(2)(a) and s 37(2)(e)
Paragraphs 4.48 – 4.53, including the heading and the associated footnotes	Paragraphs 4.48 – 4.53, including the heading and associated footnotes (text already redacted)	s 37(2)(a) and s 37(2)(e)
Page 68, footnote 85	Page 68, footnote 87 (text already redacted)	s 37(2)(a) and s 37(2)(e)

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1 ANAO comment: This audit report consistently matches the paragraph numbering in column 2 of this table.
2 ANAO comment: These omissions related to a previous Defence summary response dated 3 January 2018.
3 ANAO comment: The Auditor-General had already decided to omit this information before the certificate was issued.

Appendix 6 Text of section 37 of the *Auditor-General Act 1997*

1. Appendix 5 provides a certificate issued by the Attorney-General under section 37 of the *Auditor-General Act* 1997. At as 21 February 2018, the text of that section read as follows:

37 Sensitive information not to be included in public reports

(1) The Auditor-General must not include particular information in a public report if:

(a) the Auditor-General is of the opinion that disclosure of the information would be contrary to the public interest for any of the reasons set out in subsection (2); or

(b) the Attorney-General has issued a certificate to the Auditor-General stating that, in the opinion of the Attorney-General, disclosure of the information would be contrary to the public interest for any of the reasons set out in subsection (2).

(2) The reasons are:

(a) it would prejudice the security, defence or international relations of the Commonwealth;

(b) it would involve the disclosure of deliberations or decisions of the Cabinet or of a Committee of the Cabinet;

(c) it would prejudice relations between the Commonwealth and a State;

(d) it would divulge any information or matter that was communicated in confidence by the Commonwealth to a State, or by a State to the Commonwealth;

(e) it would unfairly prejudice the commercial interests of any body or person;

(f) any other reason that could form the basis for a claim by the Crown in right of the Commonwealth in a judicial proceeding that the information should not be disclosed.

(3) The Auditor-General cannot be required, and is not permitted, to disclose to:

(a) a House of the Parliament; or

(b) a member of a House of the Parliament; or

(c) a committee of a House of the Parliament or a joint committee of both Houses of the Parliament;

information that subsection (1) prohibits being included in a public report.

(4) If the Auditor-General omits particular information from a public report because the Attorney-General has issued a certificate under paragraph (1)(b) in relation to the information, the Auditor-General must state in the report:

(a) that information (which does not have to be identified) has been omitted from the report; and

(b) the reason or reasons (in terms of subsection (2)) why the Attorney-General issued the certificate.

(5) If, because of subsection (1), the Auditor-General:

(a) decides not to prepare a public report; or

(b) omits particular information from a public report;

the Auditor-General may prepare a report under this subsection that includes the information concerned. The Auditor-General must give a copy of each report under this subsection to the Prime Minister, the Finance Minister and any responsible Minister.

(6) In this section:

information includes written comments on the proposed report or the extract that are received by the Auditor-General under subsection 19(4).

public report means a report that is to be tabled in either House of the Parliament.

State includes a self-governing Territory.

Subject Index