

The Auditor-General
Audit Report No.1 2007-08
Performance Audit

Acquisition of the ABRAMS Main Battle Tank

Department of Defence

Defence Materiel Organisation

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of Australia 2007

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Canberra ACT
17 July 2007

Dear Mr President
Dear Mr Speaker

The Australian National Audit Office has undertaken a performance audit in the Department of Defence and Defence Materiel Organisation in accordance with the authority contained in the *Auditor-General Act 1997*. Pursuant to Senate Standing Order 166 relating to the presentation of documents when the Senate is not sitting, I present the report of this audit and the accompanying brochure. The report is titled *Acquisition of the ABRAMS Main Battle Tank*.

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

Yours sincerely

A handwritten signature in black ink, appearing to read 'Ian McPhee'.

Ian McPhee
Auditor-General

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

AUDITING FOR AUSTRALIA

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Abbreviations

ADF	Australian Defence Force
AIM	ABRAMS Integrated Management
ANAO	Australian National Audit Office
BFT	Blue Force Tracking
DMO	Defence Materiel Organisation
DSTO	Defence Science and Technology Organisation
EPLRS	Enhanced Position Location Reporting System
FBCB2	Force XXI Battle Command Brigade and Below
FMS	Foreign Military Sales
LPA	Landing Ship Heavy
LCM	Landing Craft Medium
OEM	Original Equipment Manufacturer
SEP	System Enhancement Programme
US	United States
USA	United States of America



Summary and Recommendations

Summary

1. The Defence Materiel Organisation (DMO) Project Land 907 (the project) is delivering a modern tank capability to the Australian Army, to replace the ageing Australian Leopard AS1 tanks. The project will deliver 59 M1A1 ABRAMS AIM (ABRAMS Integrated Management)¹ Main Battle Tanks (ABRAMS), seven M88A2 Hercules Tank Recovery Vehicles, six gunnery and one driver training simulators, 14 tank transporters,² eight fuel trucks and a logistic package of support equipment, spare parts, ammunition, facilities and initial training.
2. The total project budget, as of February 2007, is \$555 million. The acquisition of the central elements of the capability was based on the delivery of 'off-the-shelf'³ equipment, using a Foreign Military Sales (FMS) agreement, with the United States (US) Government, representing a low risk to Defence.⁴
3. The September 2003 Defence Procurement Review (the Kinnaird Report) proposed that, pending the full implementation of the two-pass approval system, Government's consideration of the November 2003 Defence Capability Plan 2004–14 could constitute First-Pass Approval of projects contained therein. The Land 907 Phase 1 budget was considered by Government in October 2003 as part of a submission by Defence, and subsequently approved for entry to the Defence Capability Plan 2004–14.
4. In early March 2004, Government agreed with the proposal to exempt projects published in the Defence Capability Plan with a 2003–04 or 2004–05 year of decision from the First-Pass Approval process, which included this project. Those projects that were recipients of the exemption were authorised to progress directly to Second-Pass consideration. The strengthened two-pass approval system was to be fully implemented for projects with a 2005–06 year of decision or later.

¹ The AIM programme constitutes a complete rebuild of the M1A1 tank, whereby they are disassembled, inspected, and where necessary refurbished, and reassembled. The process replaces an older style combat system with a digitised, integrated combat system.

² In February 2007, the Minister for Defence announced that in addition to the 14 transporters being procured by the project, an additional four transporters had been ordered by the DMO for delivery by the end of 2007. The procurement of these transporters is being progressed as an Army Minor Project, through an extension to the existing contract.

³ The Defence Capability Development Manual 2006 defines 'off-the-shelf' as a product that is available for purchase, and will have been delivered to another military or government body or commercial enterprise in a similar form to that being purchased at the time.

⁴ The combined estimated value of the series of FMS agreements supporting this project amounts to US\$ 306.73 million.

Acquisition Arrangements

5. The ABRAMS is a complete rebuild of the M1A1 tank, whereby they are completely disassembled, inspected, and where necessary refurbished, and reassembled. The AIM process takes an older combat system, and replaces it with a digitised, integrated combat system. During the AIM rebuild process, 86 per cent of the component parts of each Australian tank are replaced as new, and the remaining 14 per cent are returned to the original equipment manufacturer for inspection, and if required, replacement prior to reinstallation.⁵

6. In late June 2004, the DMO negotiated, and signed an FMS agreement with the US Government to deliver the tanks, and recovery vehicles, along with a range of support equipment. The prime FMS agreement represents some 57 per cent of the total project budget, with other major components of the project relating to repair parts (17 per cent) and facilities (six per cent).

7. Defence considers that acquiring items through an FMS Programme represents an attractive alternative to commercial acquisition methodologies where: the US Department of Defense has better bargaining power; economies of scale can be achieved by leveraging from other countries' orders; and it assures compatibility with, and long-term support from, the US Department of Defense.

8. In support of the prime FMS agreement (at an estimated value of US\$ 302.95 million), a second FMS agreement, worth some two per cent of the total budget, is delivering the tank-borne equipment required to support a satellite based Battle Management System for the ABRAMS capability⁶. Off-platform capability associated with satellite communications for the ABRAMS Battle Management System is being provided separately by the Defence Chief Information Officer Group, and has suffered schedule delays.

Audit approach

9. The objective of the audit was to assess the effectiveness of management of the procurement of a major, replacement capability for the

⁵ The DMO advised the ANAO that the AIM process delivers a system that is more lethal, survivable and supportable, which includes on-board diagnostics and latest generation night fighting capability.

⁶ Defence advised the ANAO that the second FMS agreement includes the provision of off-platform equipment intended to be used by the Chief Information Officer Group in provision of the off-platform capability. However, errors in the FMS agreement have resulted in this equipment not being made available for sale at the stated price. Consequently, the full value of the FMS agreement will not be realised and Chief Information Officer Group must seek alternate methods for obtaining the equipment.

Australian Defence Force (ADF) by the DMO, and Defence. The audit reviewed the initial capability requirements and approval process; analysed the acquisition agreements for elements of the project; and examined the interim through-life support arrangements being put in place to support the capability.

Overall audit conclusions

10. The project to acquire the ABRAMS tank capability has effectively reduced acquisition and development risks by procuring equipment that is part of a fully developed 'military off-the-shelf' US Government programme.⁷ In parallel, Defence did not vary the product performance specifications during the acquisition, which has served to ensure the delivery of the required capability on time, to budget, and to the required quality.

11. The project is being effectively managed by the DMO to deliver an improved, replacement capability for the ageing Australian Leopard AS1 Main Battle Tanks. The teamwork required to deliver the capability, incorporating multiple Groups within the DMO and Defence, has been successfully managed to ensure that the capability is likely to be delivered on schedule, to the Army, by July 2007. In doing so, the key elements associated with delivering fundamental inputs to capability⁸ were in place, and operational, to support individual training, and acceptance testing, as required.

12. As of the end of April 2007, the DMO had expended some \$408 million on the project to acquire the 59 ABRAMS tanks, seven M88A2 Hercules Recovery Vehicles, 14 commercially contracted heavy tank transporters, eight fuel trucks, ammunition, the onboard elements of a Battle Management System, and supporting logistics and ammunition. The ANAO notes that delays have been associated with a separate, yet supporting Defence Chief Information Officer project to provide Army with a commercially sourced satellite communications facility for the Battle Management System. Army has reported that this delay has in turn delayed the Army's planned training programme.

⁷ The new ABRAMS are battle proven, with high levels of crew survivability. The supporting M88A2 Hercules Recovery Vehicles are similarly operationally proven, and have been accepted into service by the US Military.

⁸ Defence define the fundamental inputs to capability as the standard list for consideration of what is required to generate 'capability', comprising organisation, personnel, collective training, major systems, supplies, facilities, support, command and management.

Key findings

Source Selection (Chapter 2)

13. In seeking project approval, Defence recommended the acquisition of the ABRAMS capability over all other options considered, primarily on the basis of proven operational survivability and cost. The ANAO reviewed the analysis undertaken as part of the preparation for Second-Pass approval.⁹ The full suite of required Second-Pass documentation (which included: the Operational Concept Document;¹⁰ the Functional Performance Specifications;¹¹ the Test Concept Document;¹² and Acquisition Business Case¹³) had not been finalised at the time of Second-Pass Approval in March 2004.¹⁴

14. In March 2005, the DMO proposed that the FMS agreement be extended to include a Battle Management System, which serves as a communication link showing, inter alia, the geographic location of friendly units on a battlefield.¹⁵ The selected system is one that was already manufactured by the US, and integrated to US Army ABRAMS M1A1 AIM tanks, thus reducing integration risks associated with adding the system to the tanks following the AIM process. The system is being treated as an interim system, and is not intended to interface with any existing ADF system.¹⁶ The first stage of the Battle Management System availability was scheduled for

⁹ The ANAO was advised that the compressed analysis period between First-Pass and Second-Pass Approval was primarily necessary to reduce the time Army was reliant on the obsolete Leopard 1 tanks in service, and to ensure staff availability for this project. The ANAO was also advised that Australia was able to access the US production line for M1A1 AIM tanks up until 2010.

¹⁰ The Operational Concept Document is the primary reference for determining fitness-for-purpose of the desired capability.

¹¹ Functional Performance Specifications define critical performance attributes for the required capability, such as how fast it must travel, how much fuel it should use during specified operational uses, and how accurate its weapons systems should be.

¹² The Test Concept Document provides the basis for DMO's development of the Test and Evaluation Master Plan, and is the highest level document that considers test and evaluation requirements.

¹³ The Acquisition Business Case provides an overview of the proposed capability option, and specifies key advantages of the preferred option, as well as costings, a time line for delivery, and a risk management assessment.

¹⁴ The ABRAMS M1A1 AIM tanks are a production model, with known operating and maintenance costs for the methods by which they are operated in the US Defense Forces. The analysis would have benefited from a more detailed analysis of costs associated with Life Cycle Costs as applied to Australian operating circumstances, and Test and Trials, however in the absence of a Test Concept Document, and in the environment of a fast tracked analysis period, Defence advise that this analysis was not possible in the time allocated for developing Second-Pass Approval documentation.

¹⁵ The Battle Management System provides, in addition to force distribution information, terrain data, location of known enemy forces, friendly locations, and the ability to send and receive messages and map overlays.

¹⁶ The DMO advise that it is capable, with software modifications, of supporting a Variable Message Format System in the future, should a system of this nature be procured for use as the preferred Defence Network Centric Warfare data communications system.

April 2007, however it has been delayed with a temporary service schedule to be provided in July 2007.¹⁷

Acquisition management (Chapter 3)

15. The FMS Programme is a key means by which the Australian Government procures military goods and services, directly from the US Government. Once selected as a procurement method, the Australian Government is obligated to make payments, on demand, prior to the delivery of equipment from the US. To give effect to the FMS Programme, Australia is required to maintain a bank account at the US Federal Reserve Bank in New York, from which the US Department of Defense draws down progressive payments into a trust fund,¹⁸ from which contractors are paid. As of February 2007, the balance of the interest bearing Reserve Bank of Australia FMS bank account was US\$ 207 million.¹⁹

16. The first batch of tanks and recovery vehicles arrived in Australia in September 2006, following their use with training Australian instructors in the US. The six gunnery simulators and one driver training simulator have been delivered, and are in use training Australian Army personnel. Tank transporters and fuel trucks are being progressively delivered, and have been used to support tank training operations in Australia. The final delivery of tanks from the US occurred in March 2007.

17. The ANAO reviewed the risk²⁰ management of the transportation of the first delivery of ABRAMS tanks and Hercules Recovery Vehicles in September 2006 from the US to Australia.²¹ The DMO did not fully analyse and document the risks associated with moving the tanks to Australia using commercial sea transport. A developed risk analysis of the commercial transportation of the first delivery of tanks, had it been undertaken, could have

¹⁷ Defence advised the ANAO in June 2007 that the project to implement the off-platform capability has been re-scoped to provide a temporary L-Bank satellite service for one year and a PDS to investigate follow requirements including non-satellite solutions. That is, it does not have multiple stages. The estimate for temporary services is now July 2007.

¹⁸ The draw down payments to FMS suppliers are made through the non-interest bearing US Department of Defense Trust Fund Account, and occur on a bi-monthly basis in order to minimise the level of funds held in this account.

¹⁹ The Reserve Bank of Australia quoted exchange rate at this date was 0.7880, which equates to \$A 262.69 million.

²⁰ Risks associated with transporting tanks by sea include the loss of the shipment through sinking, or damaged goods while in transit.

²¹ At that time, Defence maintained the capability to transport the vehicles by road, on specifically designed tank transporter vehicles.

included consideration of utilising a costed insurance quote in the event of loss of the shipment at sea.²²

18. The declared Australian Customs Service (Customs) values associated with the importation of the first batch of 18 tanks, and five Hercules Recovery Vehicles in September 2006 were reported as \$43.09 million, which was not representative of the purchase values of the shipment. The Customs Declaration Form, submitted as part of the importation process for the shipment, understated the value of the 18 imported tanks and the five transported Hercules Recovery Vehicles by some \$91.56 million. The ANAO also notes that there was a corresponding misstatement associated with the DMO Business Activity Statement for the period, and of the monthly importation figures calculated by the Australian Bureau of Statistics for national accounts purposes for international trade in goods and services. The Project Office advised the ANAO in February 2007 that a revised N10 Import Declaration had been submitted to Customs, where the value of the imported goods has been recalculated to be \$134.65 million.

19. Provision of the Heavy Tank Transporters, and Tactical Fuel Trucks is being managed via commercial contracts with Australian suppliers, which are cumulatively worth some \$22 million. The relevant contractors have delivered these capabilities to schedule.

Through-life support (Chapter 4)

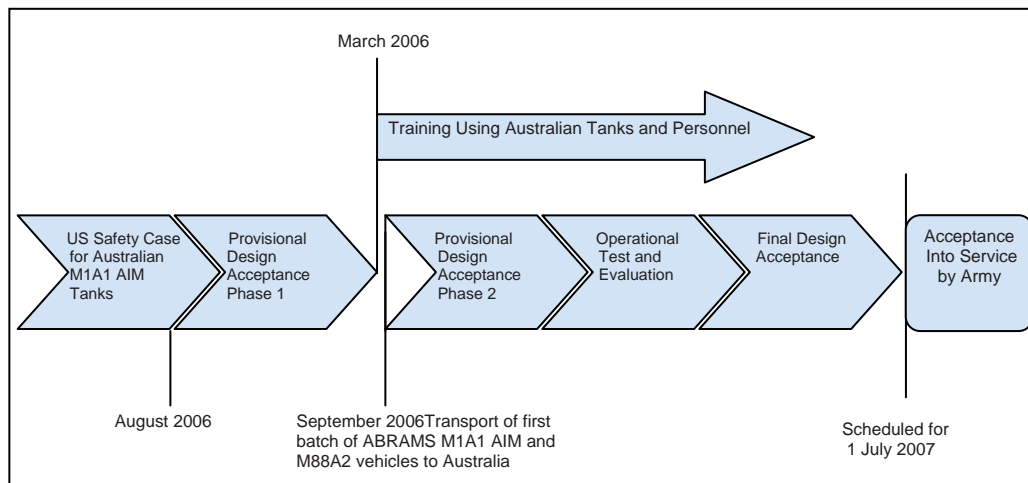
20. The engineering activities required to introduce a capability into service include Design Acceptance, Safety Management, Test and Evaluation, Configuration Management, Quality Assurance and Defect Investigation. The Design Acceptance of the tank and recovery platforms is being progressed using three key milestones: Provisional Design Acceptance Phase One; Provisional Design Acceptance Phase Two;²³ and Final Design Acceptance, following an Operational Test and Evaluation report, certifying that there are no operational safety issues, and that Army Headquarters accepts the capability, which is planned for July 2007 (see Figure 1). At the time of audit fieldwork, neither Design Acceptance, nor Operational Testing and Evaluation had been completed.

²² Following the ANAO recommendation, the DMO did consider insurance as a risk mitigator for the second shipment of tanks to Australia, and made the decision that the low probability of loss did not justify the costs of insurance.

²³ As at the time of fieldwork, Provisional Design Acceptance Phase two had not been granted.

Figure 1

Acceptance and test process for Australian ABRAMS Tanks



Source: ANAO analysis of DMO processes

21. As of early 2007, the Australian Safety Case associated with the tanks had not been completed, prior to the start of training activities in Australia, using the first batch of delivered tanks.²⁴ The DMO assessed that prior acceptance by the US Defense Forces of similar platforms, in conjunction with a managed hazard assessment log, and integrated instructor training by experienced US Defense Force instructors, mitigated the risks associated with using the delivered tanks in the absence of a completed Australian Safety Case.²⁵

22. In September 2006, the Minister for Defence announced that the options for transporting the ABRAMS included C-17 heavy airlift aircraft; amphibious ships; the Adelaide to Darwin rail network; and new tank transporter trucks. Trials associated with transporting the Australian ABRAMS, using the recently procured C-17 aircraft, have not yet been undertaken using Australian equipment.

²⁴ The Safety Case for the M88A2 Hercules Recovery Vehicles was approved in November 2006. Of the managed safety issues identified, the ability to ford deep water (1.4m to 2.2m) presents a tangible risk to operators through suffocation. The M88A2 Safety Case recommends the use of night vision equipment as standard practice in reduced light scenarios.

²⁵ The DMO advised the ANAO that the compressed acquisition timeframe was a key factor in accepting the tanks prior to having undertaken an Australian Safety Case, and that whilst the final Safety Case was not completed prior to the commencement of training, a risk analysis concluded that; based on the widespread use of M1A1 tanks by the US military, coupled with the significant amount of information available on the operation of the tanks during initial training for Australian instructors in the US, minimal risk was evident.

23. The DMO advised the ANAO that it had maintained the ability to deliver the ABRAMS and M88A2 Hercules Recovery Vehicles by road to all the areas where Leopards would otherwise have been transported. In addition, Defence advises that the rail study has been completed and that the Request for Tender for heavy rolling stock has been released.

24. The maintenance concept for the ABRAMS will consist of two levels of repair; light and heavy. The ANAO has been advised that Army will continue to provide light maintenance to its tank capability in Darwin utilising uniformed tradesmen, and in Puckapunyal, using contracted staff, in keeping with the current arrangements for the Leopard AS1 tanks. Heavy maintenance will be offered to industry through the release of a Request for Tender for support service, in the second quarter of 2007.²⁶ The stated aim is to deliver the best value for money for the Government. The DMO has advised the ANAO that there is no preference or mandate for any particular geographical location for this maintenance.

25. The Tank Driver Trainer, and six Advanced Gunnery Training Systems have been delivered and set to work within allocated budgetary and schedule requirements. The DMO estimates that the maximum costs associated with through-life support for these training capabilities will not exceed \$4.8 million²⁷ for the first seven years, with a planned life of type of 10 years. The DMO advise that the original equipment manufacturer recommended a specific Australian firm be engaged as the sole source provider for the simulator through-life support. The DMO subsequently engaged the recommended firm, on the basis that the original US based equipment manufacturer will remain the design authority for the simulators.

26. The planning and integrated nature of the training to introduce the new capability relied heavily on the ability to utilise simulation equipment. In addition, the strategy called for a progressive training plan to: train Australian instructors in the US; then train instructors in Australia; and finally, train equipment operators, maintainers and logisticians in Australia. The Project Office has effectively managed its training requirements as at the time of audit fieldwork, and has reportedly met individual training targets.

²⁶ Defence advised the ANAO that the intention to the release the Request for Tender in May 2007 has been overtaken by the recent decision to delay the release of the Request for Tender until late 2007. This delay will be mitigated through consultation with industry towards the adoption of a better performance based approach.

²⁷ Defence advised the ANAO that this cost does not include the cost of the platform FBCB2-BFT service. Estimated cost for the first year is \$3.3 million.

27. The increased operating costs associated with the new capability will limit the total distance the fleet can be driven in any one year, and reduce the use of training ammunition from the current use rate. These considerations have been taken into account when deciding to procure the capability, and simulation has been used, where possible,²⁸ to reduce the costs associated with training. In addition, the use of 120mm training rounds will be reduced by the use of a .50 calibre main armament barrel insert, which will simulate the use of 120mm training rounds, thus increasing barrel life, and reducing the frequency associated with replacing main armament barrels.

28. The ANAO reviewed work undertaken by the DMO to ascertain the spare parts required to be held in physical inventory for the ABRAMS. The work undertaken considered the tanks geographical dispersion within Australia, planned track mileage and the intended operating terrain. As of early 2007, nearly all of the total items ordered had been shipped to Australia.

Defence and DMO response

29. The Department of Defence provided a response (see Appendix 1) on behalf of the DMO and Defence. The Defence response stated that:

Defence considers that the acquisition of the Abrams tank capability through Project Land 907 has been an outstanding success, and is pleased that this ANAO audit reinforces that judgement. The Defence Materiel Organisation has successfully managed the delivery of the Main Battle Tank capability ahead of schedule and on budget.

It is noted that the audit has not raised any matters that the ANAO considered warranted a recommendation for action. All issues that have been noted in the report have been addressed or are being addressed. Release of a Request for Tender for through-life support has been delayed until slightly later in 2007, to allow time for the Defence Materiel Organisation to engage more fully industry. With respect to the battle management systems, Defence expects to have suitable satellite support in place by mid 2007.

²⁸ A new tank driver training facility is being used to reduce the time required to qualify soldiers to drive the ABRAMS tanks. The project is also procuring six Advanced Gunnery Training System Simulators, which will serve to reduce the amount of live ammunition required to train for, and maintain, gunnery skills.

Audit Findings and Conclusions

1. Introduction

This chapter provides an overview of the ABRAMS Programme, and includes a schedule of events associated with the delivery of capability.

Background

1.1 Since the release of the Defence White Paper in 2000 'Defence 2000—Our Future Defence Force', the ADF has assessed that its current in-service tank, the Leopard AS1, no longer meets the requirements of the Army.²⁹ Defence has noted that future land operations are likely to occur in complex terrain against a threat from a range of highly lethal hand-held weapons at short engagement ranges. This, coupled with rapid increases in relatively cheap, effective anti-armour and anti-tank technology, renders the Leopard tank as no longer being capable of effectively performing its role in a balanced combined arms team.

1.2 Defence assessed that its ability to support the existing fleet of 75 Leopard AS1 tanks³⁰ until their anticipated Life of Type in 2020 is under growing pressure, because increased operating and life cycle support costs are impinging on the allocated support budget. When purchased in 1973, the Leopard AS1 was assessed as the best tank in the world with a leading edge fire control system and protection levels appropriate for the battlefields of the time.³¹ In the intervening period, developments associated with the Leopard have not been incorporated to the Australian version of the tank. This has rendered the Australian AS1 Leopard tanks an orphan fleet which is no longer included in the cooperative logistics arrangements that once guaranteed a supply of replacement parts. Defence noted in 2004 that the logistic supportability of the Leopard AS1 is problematic and will further decline over time.

1.3 The requirement for tanks as a component of the Australian Defence requirement was reviewed by the Defence Science and Technology Organisation (DSTO). DSTO analysis of lessons from tactical battles confirmed

²⁹ The core business of an Army is to conduct close combat against an enemy using combined arms teams. A combined arms team is made up of infantry, armour, artillery, engineers and army aviation. Within this formation the tank plays a central role providing protection, communication and firepower.

³⁰ The tank capability being replaced comprises 75 Leopard main battle tanks, 15 main battle tank dozers, eight armoured recovery vehicles medium, and five armoured vehicle launched bridges.

³¹ In 1994, a decision was taken not to spend the then \$65 million required to maintain and extend the Leopard AS1 capability to 2020.

the need for a tank capability as part of a combined arms team whenever Army is confronted with a task that demands the capacity to conduct close combat.³²

1.4 Table 1.1 represents a time line that identifies the key points of this project. Of note is that there is a compressed time period between First and Second-Pass Approvals, during which Defence assessed, and refined the available options, with the information they had available at the time.³³

Table 1.1

Delivery of Capability: 2003 to April 2007

Required Date	Programme Activity	Actual Date
November 2003	First-Pass Approval	November 2003
March 2004 ^(a)	Operational Concept Document	May 2004
March 2004 ^(a)	Acquisition business case approved	May 2004
March 2004	Second-Pass Approval	March 2004
October 2006	Delivery of tank transporters	August 2006
August 2006 to January 2007	Delivery of simulators to Australia	Simulators have been delivered on time to support training
October 2006 to January 2007	Delivery of ammunition	Ammunition has been delivered as required to support training
October 2006	First batch of 18 tanks and five recovery vehicles delivered	September 2006
March 2007	Second batch of 41 tanks and two recovery vehicles delivered	March 2007
July 2007	Initial Operational Capability with one squadron of 13 tanks	Pending

Notes: (a) These documents are required prior to applying for Second-Pass (Government) Approval to implement a Major Capital Equipment programme.

Source: ANAO analysis of DMO and Defence documentation

1.5 In making the choice to replace the Leopard fleet, three platform types were considered, namely: the LEOPARD 2 and LEOPARD 2 variants,³⁴ ABRAMS variants and CHALLENGER 2. In March 2004,

³² Combined arms teams are flexible groupings of the Army's battlefield operating systems, for which protected combat vehicles comprise part of the manoeuvre element in these systems, and provide for protected mobility, protected close combat mobility, and protected close combat direct fire.

³³ The DMO Acquisition Strategy, dated May 2004, notes that Project Land 907 was considered by Government and given First-Pass Approval in November 2003, and directed that an analysis of options be undertaken and a revised Cabinet Submission be provided for Second-Pass consideration in early 2004. The DMO Acquisition Strategy notes that the compressed approval timeline resulted in the project being fast tracked, requiring parallel planning and analysis activities to be conducted within the Defence Capability Systems Division, DMO and Army.

³⁴ The Leopard tank chosen as an option is a new tank, manufactured by the same company that made the existing Leopard AS1 tanks currently in service.

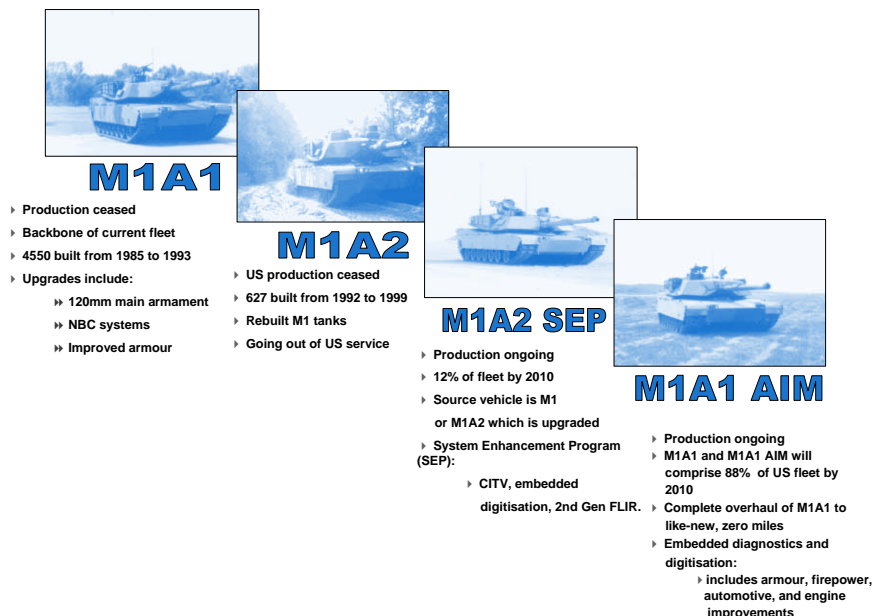
Government approved the acquisition of the ABRAMS M1A1 AIM as the Army's next generation Main Battle Tank.³⁵

1.6 Defence considers the ABRAMS to have an operationally proven level of crew survivability and protection, a factor which is enhanced by the segmentation of ammunition and crew within the vehicle.³⁶ The ABRAMS alternative was also assessed by Defence to offer the best potential support to Army's evolving network centric warfare requirements.³⁷

1.7 The history of development, leading to the ABRAMS M1A1 AIM variant is illustrated by Figure 1.1, where it can be seen that the majority of future US tanks will be of a class similar to those being procured by the DMO for the ADF.

Figure 1.1

ABRAMS M1A1 AIM Tank Development History



Source: Defence

³⁵ The submission included specific reference to DMO providing ammunition for an indicative three years, a portion of which was to 'establish a war reserve for the appropriate high readiness elements of capability'. Defence advised that the M1A1 AIM tanks provided for Project Land 907 were selected from stocks that had been pre-positioned in Europe by the US Defense Force to serve as war stocks.

³⁶ Defence noted that the ABRAMS M1A1 AIM is already fielded in large quantities and will remain the mainstay of the US tank fleet beyond 2020, and could be delivered to Australia within a compressed timeframe.

³⁷ The DMO advise that the M1A1 AIM tanks purchased by the DMO are the same version as the more than 4000 that the US Defense Forces will eventually field as part of the AIM process.

1.8 DMO Project Land 907 will deliver a complete tank capability for Army, including logistical support. The project is scheduled to deliver the following outputs:

- 59 ABRAMS M1A1 AIM tanks;
- seven M88A2 Hercules armoured recovery vehicles;
- six advanced gunnery trainer simulators;
- one tank driver trainer;
- 14 tank transporters and trailers; and
- eight tactical fuel trucks.

1.9 The delivery of the tanks, trainers, and armoured recovery vehicles through DMO Project Land 907 Phase 1 is being managed through the US FMS Programme. The process associated with manufacturing an M1A1 AIM tank is wholly managed by the US Government. For each tank with 6256 components, the programme replaces 5368 components with new items, and validates and replaces, if necessary, 888 components.

1.10 The FMS agreement implemented to supply the vehicles requires the Original Equipment Manufacturer tank supplier to rebuild ABRAMS tanks of various ages and configurations to the build standard required by the US Government. The DMO advised the ANAO that by adding the Australian procurement order to the US Army order for upgraded ABRAMS M1A1 AIM tanks, the DMO was able to minimise any design and engineering changes which generally cause schedule delays and cost increases. The DMO further advised that the use of the FMS system, whilst not without risk, further enhanced the reduction of schedule risk through leveraging from contracts already in place.

1.11 The tanks, once accepted into service, will be operated by the 1st Armoured Regiment (Darwin, Northern Territory), the School of Armour (Puckapunyal, Victoria) and the Army Logistic Training Centre (Bandiana, Victoria). The first batch of 23 vehicles, comprising 18 tanks and five armoured recovery vehicles, were delivered for use in the initial training of Australian Army operators and maintainers, in the US. The vehicles subsequently arrived in Australia in September 2006, with the second batch delivered to Darwin in March 2007. There is a requirement to deliver an operational Tank Squadron Group of 13 tanks by July 2007.

1.12 All simulators have been manufactured and delivered to Australia. As of early 2007, all eight fuel trucks had been delivered;³⁸ and 14 transporters had been delivered.³⁹

1.13 Expenditure exceeded the budget for 2005–06, caused by the earlier achievement of delivery of spare engines. Delivery of support equipment will continue during 2006–07 to facilitate the initial introduction into service of this capability by July 2007.

1.14 A breakdown of the anticipated cost breakout for the project elements is outlined in Table 1.2.

³⁸ The contract to deliver eight fuel trucks, at a cost of \$4.7 million, was signed in December 2004.

³⁹ The contract to deliver 14 transporters was signed in May 2005, at a cost of \$17.37 million, which included maintenance and support for a period of three years.

Table 1.2**Land 907 Phase 1 Project Cost by Element**

Project Element	2004-05 \$ million	2005-06 \$ million	2006-07 \$ million	2007-08 \$ million	2008-09 \$ million	2009-10 \$ million	Follow-on Years \$ million	Totals \$ million
Prime Equipment	4.78	19.13	72.43	85.95	45.33	12.58	0	240.23
Support Vehicles	0	19.13	27.16	9.55	5.49	0	0	61.34
Integrated Logistic Support	0	4.78	36.21	38.20	18.13	11.97	0	109.31
Government Furnished Equipment	0	0	0.90	1.43	0.90	0	0	3.24
Training Systems	0	0.95	9.05	3.48	1.81	0	0	15.30
Facilities	0	0.95	0.90	14.32	7.46	0	0	23.65
System Test and Evaluation	0.47	0.95	0.90	0	0	0	0	2.35
Project Management	1.91	4.78	4.52	3.82	2.72	0.96	0	18.78
Contingency ^(a)	0	0	0	0	0	0	58.01	58.01
Total	7.18	50.71	152.12	156.76	81.85	25.52	58.01	532.15

Notes: (a) The ANAO notes that contingency budget had not been assigned to specific risk elements identified for the project schedule, and was represented as a whole of project contingency management fund at the time the Acquisition Strategy was approved. DMO policy requires contingency to be represented, in financial terms, as a 'Follow-on Years' allocation. The DMO advised the ANAO that contingency is allocated against major items, such as through-life support, facilities and repair parts.

(b) Table entries have been rounded to two decimal points. Totals may not necessarily be the sum of the rounded table entries.

(c) Defence advised the ANAO that this cost does not include the cost of the platform FBCB2-BFT service. Estimated cost for the first year is \$3.3 million.

Source: ANAO analysis of DMO documentation

Audit approach

1.15 The DMO manages over 200 major capital equipment projects which have a total estimated cost in excess of \$55 billion. The approved funding of \$555 million for delivery of the ABRAMS capability amounts to one per cent of the estimated cost of DMO's major capital equipment projects.

1.16 The objective of the audit was to assess the effectiveness of management of the procurement of a major, replacement tank capability for

the ADF by the DMO and Defence. The audit reviewed the initial capability requirements and approval process; analysed the acquisition cases for each element of the project; and examined the through-life support arrangements being put in place to support the capability.

1.17 The coverage of the audit extended from development of the concept for the requirement, to acceptance of deliverables in the period up until the end of fieldwork in February 2007. The audit was undertaken during the delivery phase of the project, following delivery of the first batch of vehicles to Australia in September 2006.

1.18 Audit field work was conducted between November 2006 and February 2007. The audit team met with areas within Defence, including: the Project Office; Army Headquarters; Defence Chief Information Officer Group, Defence Infrastructure Division; Capability Systems Division; Capability Investment and Resources Division; Army Training Command; as well as operational Defence staff at Robertson Barracks in Darwin. The ANAO provided an Issues Paper to Defence and the DMO in March 2007, and a draft report in May 2007.

1.19 The audit was conducted in accordance with ANAO Auditing Standards at a cost to the ANAO of \$245 000.

Report structure

1.20 The remainder of this report is structured into three chapters. Chapter 2 outlines the source selection and considerations made to support acquisition, and through-life support arrangements. Chapter 3 discusses the management structures governing the acquisition of the ABRAMS capability. Chapter 4 examines the management arrangements in place to deliver through-life support for the capability.

2. Source Selection

This chapter reviews the considerations, and decisions made in relation to selecting the ABRAMS tank.

Background

2.1 In March 2004, the then Minister for Defence announced that the ABRAMS tank offers lower acquisition costs, comparable operational costs to at least one of the competitor solutions, and a lower through-life support cost than alternative options. The Minister also noted that the tank was chosen because it provides, apart from the cost elements, the highest overall survivability, the greatest through-life support potential and excellent mid term network centric warfare potential.⁴⁰

2.2 When developing the requirements associated with the required capability, Defence is required to undertake detailed planning to convert the capability requirements identified by Defence, and accepted by Government, into an integrated set of changes in each of the Fundamental Inputs to Capability.⁴¹

2.3 The proposals developed as part of this Requirements Phase of the acquisition process are typically required to pass through two essential decision points: First-Pass and Second-Pass Approval, which have been strengthened in response to the 2003 Defence Procurement Review (the Kinnaird Report). These approval points are Government decision points, and require a suite of documents that define the proposed capability in detail.

Requirements phase management documents

2.4 The ANAO reviewed documents Defence analysed to develop a requirements' baseline, and notes that the approved requirements are based on an operational analysis of the identified capability gap, and known risks. This analysis was incorporated into the Defence Capability Review submission of

⁴⁰ Network centric warfare is a means of realising more effective war fighting ability. This concept involves the linkage of engagement systems to sensors through networks and the sharing of information between force elements. It has two closely related and mutually reinforcing dimensions: the human dimension and the network.

⁴¹ Defence define the Fundamental Inputs to Capability as the standard list for consideration of what is required to generate 'capability', comprising organisation, personnel, collective training, major systems, supplies, facilities, support, command and management.

October 2003, and provided for entry for this project to the Defence Capability Plan.

2.5 The Defence Capability Plan outlines the Government's long term Defence capability plans and is required to be a detailed, costed, 10 year plan comprising unapproved major capital equipment projects.⁴² The Plan contains equipment acquisition proposals that are candidates for approval within the following 10 years. The Main Battle Tank Replacement Project was included in the 2004–14 Defence Capability Plan, with a scheduled in-service delivery of 2007 to 2009.

2.6 First and Second-Pass Approvals form the basis of formal Government endorsement to proceed with projects, to an approved scope, timeframe and budget. First-Pass Approval provides an opportunity for Government to narrow the alternatives being examined by Defence to meet an agreed capability gap, and provides the authority to allocate funds from the Capital Investment Programme to enable the options endorsed by Government to be investigated in further detail. Second-Pass Approval provides the authority from Government to proceed with a specific capability solution, with a defined budget for the acquisition phase.

2.7 In preparing for First and Second-Pass Approval, key documentation is required to have been finalised, prior to approval. At First-Pass Approval, the Government considers alternatives provided by Defence for consideration in meeting an identified capability gap, and is asked to approve capability development options to proceed to more detailed analysis and costing, with a view to subsequent approval of a specific capability. At the time this project was considered, the Defence Capability Life Cycle Management Manual 2002 provided guidance relating to the process to be followed in preparing for First and Second-Pass Approval.

First-Pass approval considerations

2.8 When this project was being considered, the suite of documents required for First-Pass submission to the Defence Capability and Investment Committee,⁴³ prior to preparation of a Cabinet Submission, included a Capability Requirements Business Case for First-Pass.⁴⁴ This business case is

⁴² The Defence Capability Plan does not include details of approved projects.

⁴³ The role of the Defence Capability and Investment Committee is to consider and develop options for current and future capability. The Committee is a sub-committee of the Defence Capability and Infrastructure Committee, and focuses on individual major investment projects.

⁴⁴ The Two Pass system being followed for this project was pre-Kinnaird Report.

extracted from a Preliminary Capability Options Document. The Capability Requirements Business Case, at the time this project was considered, was to have included details on, but not necessarily limited to:

- the capability gap to be reduced;
- the proposed year of decision, and in-service date;
- an estimate of the likely cost band;
- a brief description of generic options for reducing the capability gap;
- the generic options recommended for exclusion;
- the generic options to be developed further;
- how industry will be engaged in the preparation of the Acquisition Business Case;
- the identification of any implications for strategic industry capabilities; and
- the planned date for the Second-Pass to Government and the possible need for additional Government consideration.

2.9 Table 2.1 identifies the supporting documentation characteristically reviewed by the Defence Capability and Investment Committee, and required to support a subsequent Cabinet Submission for approval to develop the requirements further for First-Pass Approval, both pre, and post Kinnaird.

2.10 For this project, Defence advised the ANAO that First-Pass Approval was achieved by the addition of the Project Land 907 budget in the Defence Capability Plan, which was approved following a Cabinet Submission in October 2003.⁴⁵

2.11 The Kinnaird Report proposed that, pending the full implementation of the Two-Pass system, Government's consideration of the November 2003 Defence Capability Plan could constitute First-Pass Approval of projects contained therein. In early March 2004, Government agreed with this proposal, such that projects published in the Defence Capability Plan with a 2003–04 or 2004–05 year of decision, which included this project, would progress directly to Second-Pass consideration.

⁴⁵ The Defence Capability Manual notes that First-Pass Approval is the point at which Government considers alternatives and approves a capability development option(s) to proceed to more detailed analysis and costing, with a view to subsequent approval of a specific capability.

2.12 An analysis of the information that was prepared,⁴⁶ and accepted, against what is now required as a result of the accepted Kinnaird Report processes has been undertaken, and is outlined in Table 2.1.

Table 2.1

First-Pass Supporting Documentation—Post and Pre Kinnaird Assessment

Recommended Supporting Document	Now Required for First-Pass Approval	Required for First-Pass Pre-Kinnaird Report	Delivered as part of First-Pass in 2003
Initial business case for each option	Yes	Not specifically required	No
First-Pass capability cost estimates	Yes	Yes	Yes
Preliminary Operational Concept Document	Yes	Yes	Yes
Preliminary Functional Performance Specification	Yes	Not specifically required	No
Preliminary Test Concept Document	Yes	Not specifically required	No
Project Management Plan	Yes	Yes	No ^(a)
Equipment acquisition Strategy	Yes	Not specifically required	No

Note: (a) A First to Second-Pass Transition Plan was delivered in March 2004, following Second-Pass Approval, and specified how transition to the Land 907 Project Office would be managed over a six month period. The plan highlighted the growth of the Fundamental Input to Capability Implementation Cell, which is credited with delivering the coordinated requirements of this project on time, and as required to meet the end user requirements at delivery.

Source: ANAO analysis of Defence documentation

Second-Pass approval considerations

2.13 The Kinnaird Review notes that a strong mandatory Two-Pass system should provide a precise and understandable process for the procurement of Defence capabilities, which ensures that Government will be presented with robust proposals. The Kinnaird Review also notes that at Second-Pass consideration, each Acquisition Business Case should include: the equipment

⁴⁶ Following First-Pass Approval in November 2003, the DMO note that they were directed to undertake an analysis of options in order to support the development of a revised Cabinet Submission for consideration for Second-Pass Approval in early 2004. The DMO Equipment Acquisition Strategy notes that the compressed approval time-line resulted in the project being fast tracked. The Equipment Acquisition Strategy also notes that, due to fast tracking, detailed through-life support planning has not been completed outside that conducted as part of the preliminary Life Cycle Cost analysis conducted.

to be acquired (expressed in functional terms); budget estimates (including whole of life costs); delivery schedules; and an analysis of technology, cost and schedule risks.

2.14 Second-Pass Approval occurs when options have been clearly defined and evaluated, and a proposal has reached the stage of requiring formal Government approval to proceed to the acquisition phase. Specifically, Second-Pass Approval seeks: Government approval for Defence to seek formal offers from suppliers that lead to the selection of a materiel or facilities solution and the expenditure of capital investment funds; and Government agreement to the boundaries of the preferred solution, especially in terms of capability, costs and schedule.⁴⁷

2.15 An Acquisition Business Case is required prior to seeking Second-Pass Approval.⁴⁸ The Business Case is to be extracted from a Capability Options Document, which is supported by an Operational Concept Document,⁴⁹ a Functional Performance Specification, a Test and Evaluation Concept, and a Project Management Plan. In the case of DMO Project Land 907, Second-Pass Approval was sought in the absence of a Functional Performance Specification, without a Test Concept Document, and did not encompass an approved Acquisition Business Case.⁵⁰

2.16 The ANAO reviewed the analysis undertaken as part of the Second-Pass Approval process, and notes that there was a concerted effort to assess, and document, the costs associated with procuring the ABRAMS capability, using information provided by the US Government.⁵¹ There was far less rigorous information available for the analysis of the Swiss Panzer option,

⁴⁷ The Operational Concept Document, Functional Performance Specification and Test Concept Documentation should be finalised prior to Second-Pass Approval being sought from Government.

⁴⁸ The Acquisition Business Case for this project is dated May 2004, was developed following Second-Pass Approval, which was in March 2004.

⁴⁹ The Operational Concept Document describes how a capability is to be employed. The Operational Concept Document is largely descriptive in nature, but it is critical to a clear understanding of the tasks for which a capability will be used, how it will achieve the desired effects and the operational environment in which they must be realised.

⁵⁰ The Acquisition Strategy was developed following Second-Pass Approval, and is dated 27 May 2004.

⁵¹ The ABRAMS M1A1 AIM tanks are a production model, with known operating and maintenance costs for the methods by which they are operated in the US Defense Forces. The ANAO considers that the analysis would have benefited from a more detailed analysis of costs associated with Life Cycle Costs as applied to Australian operating circumstances, and Test and Trials. However, in the absence of a Test Concept Document, and in the environment of a fast tracked analysis period, Defence advise that this analysis was not possible in the time allocated for developing Second-Pass Approval documentation.

which was, at the time, a developmental tank with no firm, proven data relating to operating and maintenance costs.

2.17 The ANAO notes that the approved Operational Concept Document was not finalised⁵² prior to seeking Second-Pass Approval for the project. In addition, the Equipment Acquisition Strategy was not finalised at the time of seeking Second-Pass Approval.⁵³ The risks associated with not finalising this document prior to Second-Pass Approval are examined in detail by the 2003 Kinnaird Report,⁵⁴ which notes that there is a need to focus adequate attention on managing and costing Defence capabilities on a whole of life basis.⁵⁵

2.18 In this project, the DMO advised the ANAO that the US Foreign Military Sales system and the ABRAMS capability represented low risk procurement because there was a combat-proven product, minimal Australian changes, and the use of a government-to-government arrangement that minimised the requirement for protracted commercial negotiations. The DMO further advised that the explicit statement of the technical solution in the Operational Concept Document lowered the overall risk to the project.

Key requirements

2.19 The finalised Operational Concept Document was approved in May 2004, some two months following Second-Pass Approval and notes that DMO Project Land 907 will replace, refit or consider: the current Leopard AS1 main

⁵² The initial draft of the Operational Concept Document was completed in December 2003, with a complete re-write being undertaken in February 2004. The final, approved Operational Concept Document is dated 20 May 2004. Second-Pass Approval for the project was granted by Government on 9 March 2004.

⁵³ The Kinnaird Report notes that a higher proportion of project funds should be spent on early analysis to provide better and more relevant information to Government and to ensure that projects are less likely to develop problems during the acquisition phase. This would include rigorous analysis of technology, and cost and schedule risks, including external scrutiny and verification.

⁵⁴ The Kinnaird Report notes that, approval at the completion of the Second-Pass process is often sought on the basis of a broad description of the capability proposed, limited understanding of the inherent risks and an absence of robust cost, schedule and technology analysis. Approval is also sought before whole of life costs are well defined.

⁵⁵ Following Second-Pass Approval, the DMO Land Project Assurance Board was advised that there had been considerable staff effort in deriving the whole of life cost for the new tank capability, however there remained project issues, in terms of deliverables that needed to be identified or refined, such as the number of fuel tankers or tank variants. The Project Assurance Board was also advised that capability definition documents, such as the Operational Capability Document will need to be reverse engineered, and this will inform the project of the refined deliverables. In addition, the Project Assurance Board was informed that consideration was being given over to packaging the provision of spares and support for the capability to allow a single prime contractor the ability to manage support, however at the time of Second-Pass Approval, the through-life support philosophy had not been finalised.

battle tank capability;⁵⁶special equipment such as dozer blades and mine clearing attachments;⁵⁷support vehicles, such as armoured recovery vehicles, tactical fuel trucks and tank transporters; logistic support and training systems, including simulation for collective training; through-life sustainability at least until 2020, possibly out to 2030; and Network Centric Warfare potential.⁵⁸

2.20 The version of the Operational Concept Document used to develop Second-Pass analysis documentation differs from the finalised selection of requirements. The ANAO notes that the Minister for Defence was not informed of the changes to the Operational Concept Document, nor any capability changes associated with the requirement to deliver specific capability elements under Project Land 907 from the period spanning Second-Pass Approval in March 2004, until the finalisation of the Operational Concept Document in May 2004.

2.21 Defence advised the ANAO that capability not able to be delivered within the budgeted costs for Project Land 907 will be considered for delivery during Project Land 907 Phase 2, which is anticipated to be fully scoped for inclusion to the Defence Capability Plan 2008–18.⁵⁹

2.22 Interoperability is an important requirement for these tanks.⁶⁰ The priorities for interoperability as specified in the requirements documentation for Project Land 907 are the:

⁵⁶ The scope of DMO Project Land 907 does not fully replace the existing Leopard capability, in that the project does not cater for mine ploughs, which may be funded using DMO Project Land 144 or the Minor Projects programme. Project Land 907 also does not provide for armoured vehicle launched bridges, which was a requirement prior to Second-Pass Approval, but left out of the Operational Concept Document versions following Second-Pass Approval. The ANAO was informed that Land 907 Phase 2 may consider added capability for procurement at a future time.

⁵⁷ This capability is not being delivered by DMO Project Land 907 Phase 1.

⁵⁸ Defence note that, given a tank's integration of survivability, firepower and mobility: it can uniquely contribute to a Network Centric Warfare environment with its ability to carry and use a range of day and night electro-optic long range sensors over extended durations; it can provide a protected command and control system with an integrated power source and a range of ready to use variable power antennas; endure a broad range of enemy threats over an extended period; quickly be re-tasked from one location or mission to another; and disseminate and manage information gathered during close combat and other supported missions.

⁵⁹ Defence advised the ANAO in June 2007 that while Land 907 Phase 1 is considering enhancements to Abrams currently fielded by the US, they are not considering Rear Protection Armour kit, nor are they aware of any such development in the US. Enhancements being considered include Abrams Reactive Armour Tiles, while Land 907 Phase 2 may consider current developmental enhancements.

⁶⁰ Interoperability is defined as the ability of systems, units or forces to provide the services to and accept services from other systems, units or forces and to use the services so exchanged to enable them to operate effectively together.

- ability to foster joint interoperability, by bringing force element groups into the network and maintenance of connectivity with other key government agencies and the national support base;
- development of appropriate force options to operate within an international coalition for tasks that support the Government's wider interests, which include the ability to operate with current and future US forces; and
- ability to remain capable of operating within, and potentially leading, coalitions involving our neighbours and regional partners.

2.23 In terms of developing a requirement for the proposed capability, Defence notes that, for Project Land 907, the stated interoperability priorities indicate that the US should be the primary focus for achieving technical interoperability.

2.24 The indicative funding sought in the Operational Concept Document for the entire project was \$532 million,⁶¹ and plans for the introduction into service as an initial operational capability on 30 June 2007, and as a full operational capability on 31 December 2008. The Operational Concept Document notes that the replacement capability is required to be operable within the annual funds currently allocated to the Leopard AS1 capability.⁶²

2.25 The Operational Concept Document also notes that, in consideration of the hierarchy of tank capability, the ADF does not require a tank at the top of the range (that is, a Tier One capability, such as the ABRAMS M1A2 SEP and Leopard 2A6 tanks). The Operational Concept Document also notes that candidates such as ABRAMS M1A1 AIM and Leopard 2A5 tanks are appropriate to meet expected regional requirements for survivability, firepower, mobility, affordability, and communications interoperability.

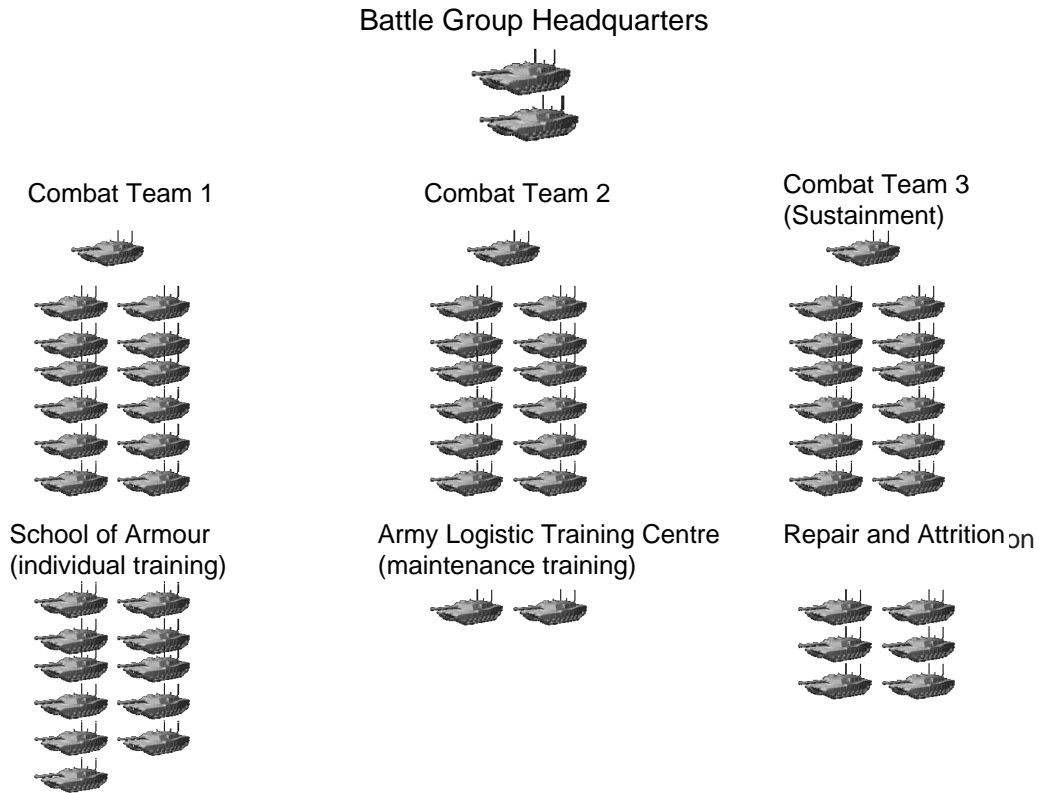
2.26 The required Tank Regiment to be delivered, and supported, is represented by the configuration at Figure 2.1.

⁶¹ This price is quoted in 2003–04 constant dollar prices.

⁶² The annual cost used to assess alternatives was \$A30 million.

Figure 2.1

Configuration of the required Tank Regiment (ABRAMS)



Note: Supporting Tank Transporters, Fuel Trucks and Recovery Vehicles are not shown in this figure.

Source: DMO

Capability options analysis

2.27 In seeking Project Approval, Defence recommended the acquisition of the ABRAMS capability over the other options, primarily on the basis of proven operational survivability and cost. Based on a recommendation from Defence, Government approval for the project to acquire the ABRAMS M1A1 AIM capability was given in March 2004.

Capability options

2.28 Based on the preliminary capability and cost analysis undertaken by Defence, two contenders emerged as preferred options to replace the existing Leopard AS1 Main Battle Tank capability. Those were: the ABRAMS M1A1 AIMS Main Battle Tank; and the Swiss RUAG PANZER 87/WE Main Battle Tank, an updated version of the Leopard 2 Main Battle Tank, which is planned

to be manufactured under license in Switzerland. These two options were reviewed in greater depth, as far as possible with the information that was available, during the period following First-Pass Approval (November 2003).

2.29 Table 2.2 illustrates the stated, preferred advantages Defence associated with each of these two options.

Table 2.2

Select assessment criteria for the preference to acquire M1A1 AIMS ABRAMS Tanks

Analysis Element	ABRAMS M1A1 AIMS	Swiss RUAG PANZER 87WE
Overall Survivability	Superior	Not as competitive
Through-Life Support Costs within the current budgetary allocation	Documented and achievable, ^(a) albeit with reduced track kilometres ^(b) (Calculated with some degree of certainty to be \$30.1 million per year)	Developmental tank, however assessed as achievable (Assessed with limited certainty to be of the order of \$29.9 million per year) ^(c)
Network Centric Warfare Potential	Definite Network Centric Warfare compatibility, and interoperability with USA Forces	Not immediately usable

- Notes:
- (a) The through-life support costs associated with the ABRAMS M1A1 AIMS Tanks were based on detailed information on costs of operation by the US forces for over 3000 tanks in service. The costs were calculated for 59 vehicles travelling 65 000 track kilometres per year, with no more than 5000 full bore training rounds being used per year. The costs are sensitive to the number of track kilometres, the type and rate of ammunition being used, and the availability of simulation for training.
 - (b) The average annual cost of support for the current Leopard AS1 Main Battle Tank capability was reported to be \$30.1 million in 2003, excluding personnel costs, based on the Leopard fleet travelling 94 000 track kilometres (\$13 million), and firing 7400 full bore training rounds annually (\$17.1 million).
 - (c) These costs were estimated for 84 900 track kilometres, and 6450 rounds of full bore training rounds, and 15 200 rounds of 27 mm ammunition.

Source: Defence

2.30 Of the other options considered, the British made CHALLENGER 2 tank was discounted because it was assessed as being far more expensive than any of the other options, with an acquisition cost (at an estimated \$9.6 million each) of at least twice that of the ABRAMS AIM M1A1 tanks, and at best, a comparable through-life support cost profile.⁶³

⁶³ The ANAO was informed that the British CHALLENGER 2 proposal could not provide for the full, required capability, and on this ground alone, made it an invalid option to pursue.

2.31 The remaining, lesser preferred options considered (which included the Leopard 2A4, 2A5 and 2A6 variants) were not considered as competitive in terms of operational capability, as these would have been supplied as aging, and second hand tanks, of lesser capability.⁶⁴

2.32 The ABRAMS M1A1 AIMS is overhauled by US Forces every 10 000 kilometres. In an effort to reduce operating costs, Defence advised that the intent is to conduct necessary maintenance on an as required basis, which is anticipated to reduce maintenance costs for the capability.⁶⁵ In addition, Defence advised that the costs associated with the high fuel consumption of the ABRAMS M1A1 AIM gas turbine will be offset by the reduced track kilometres.⁶⁶

2.33 DSTO assisted with reviewing the analysis process, and associated risk assessment outcomes associated with choosing the ABRAMS M1A1 AIMS tank over competitor tanks as part of Second-Pass preparation.

2.34 In late January 2004, the Defence Capability Committee reviewed the two preferred options, and were advised that both options, the ABRAMS M1A1 AIM and the PANZER 87 WE, offered high levels of survivability, used a 120mm smoothbore cannon, require a crew of four and met the aims of the project. Key differences in the options were identified that pointed to advantages in a number of major areas for the ABRAMS M1A1 AIM option, which included: survivability;⁶⁷ Network Centric Warfare potential; acquisition costs;⁶⁸ programme schedule risks;⁶⁹ interoperability; yet not lifecycle costs.⁷⁰ Of note is that the cost risks contrast the mature production line costs of the ABRAMS M1A1 AIM solution with the developmental costs of

⁶⁴ The analysis undertaken to assess operational viability was done in the absence of an approved Functional Performance Specification, and was, by its nature, subjectively qualitative.

⁶⁵ There has been no quantitative analysis of the projected anticipated savings from this approach to maintenance.

⁶⁶ The reduction in planned track kilometres is being facilitated by an increased reliance on simulation in training. It should be noted that fuel is not a major cost driver for the operation of these tanks, representing less than an estimated two per cent of through-life costs.

⁶⁷ The M1A1 AIM does not have turret electric controls, however the PZ87WE was assessed to have unprotected ammunition in the hull.

⁶⁸ The acquisition costs of the Swiss Panzer solution, as at February 2004, were unconfirmed.

⁶⁹ The Swiss Panzer was considered a higher schedule risk, because it was not yet in full production.

⁷⁰ The M1A1 AIM was assessed to incur higher running costs, although no detailed Life Cycle or Logistic Support Analysis was undertaken for the M1A1 AIM acquisition case, or for the Swiss Panzer which, at the time of review, was a developmental tank.

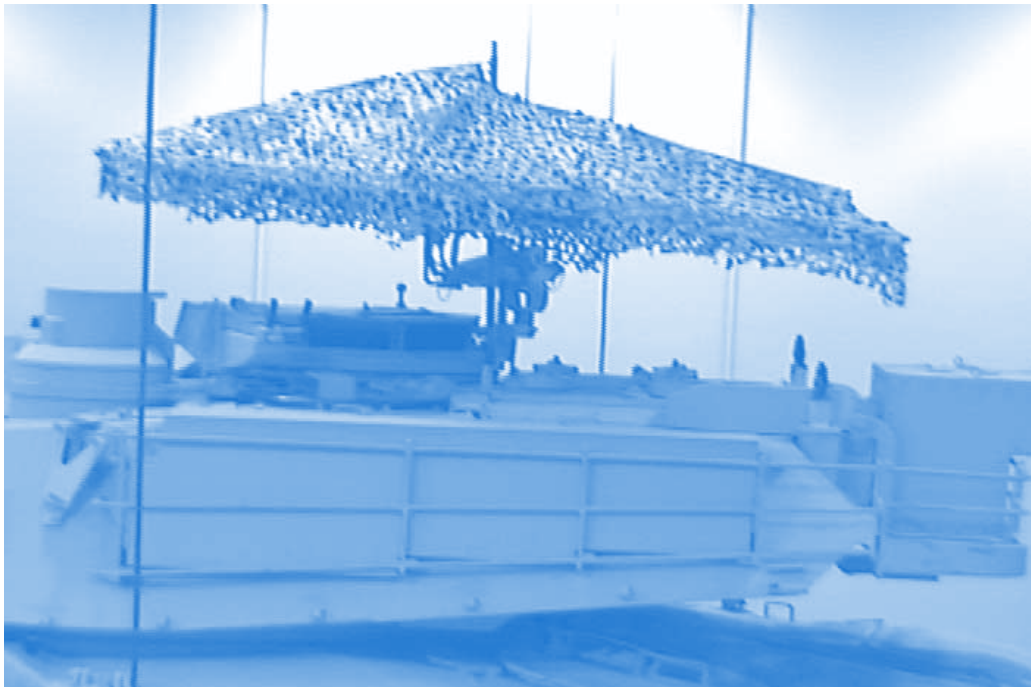
the PANZER 87 WE solution, a tank that was at that time, not yet in production.

2.35 The required level of modification to customise the ABRAMS option for use in Australia was reported as being:

- the adoption of a mobile camouflage system;
- the inclusion of a cooling system similar to the Leopard Crew Climate Control System, as illustrated at Figure 2.2;⁷¹ and
- Steyr mounts, for Australian small arms.

Figure 2.2

Australian Climate Control Umbrella for ABRAMS M1A1 AIM Tanks



Source: Defence

2.36 Cooling for the tanks includes the Australian modifications associated with heat reflecting insulation, the umbrella, and internal cool air vests.

⁷¹ The Crew Climate Control System is not air-conditioning. The system involves the production of heat reflecting insulation that is applied to the exterior of the tanks as 'clothing', as well as an external refrigerator, internal fans, and a shade umbrella. This material can be manufactured, if required, in a series of different camouflage patterns.

2.37 The ANAO was informed that the ability to constrain modifications to a few add on changes significantly improved the chances that this programme would be delivered on time and to budget, and that by constraining modifications, the supportability over the long term is improved.

2.38 Defence has chosen to specify that there should be no depleted uranium in the tanks destined for Australia. In this regard, the US Government manufactures an alternate, comparable armour choice for ABRAMS tanks, which does not rely on depleted uranium.

2.39 The audit did not review the adequacy of the non-depleted uranium armour to meet Army's requirements, nor aspects relating to certification that the tanks chosen by Defence did not, and do not carry depleted uranium armour. Defence advised the ANAO in April 2007 that:

the alternate armour arrangements meet specified Defence requirements and is suitable for Australian use.

2.40 The ANAO reviewed reports specifying that each of the barrels in the 120 mm main armament for each tank being delivered to the ADF has not been used to fire depleted uranium ammunition.

Battle management system

2.41 Defence considered the acquisition of a Battle Management System to be a highly desirable component of the replacement tank capability. The Battle Management System comprises equipment on the platforms (which provides operational staff with situational awareness of the field of operations), and off-platform equipment (which is used to provide the infrastructure to co-ordinate the platform based information).

2.42 Defence and the DMO delayed the decision to procure an appropriate system until after the FMS agreement for the tanks and recovery vehicles had been signed, to allow for further scope and cost considerations. In December 2004, the DMO estimated that a Battle Management System for 59 tanks, seven recovery vehicles, supporting headquarters, training schools and operational stock, was to cost as much as \$12 million.⁷²

⁷² Coupled with this cost is: an ongoing cost of ownership associated with a satellite link and ground station equipment that has an ongoing cost of ownership and operation; the limitations associated with the existing ABRAMS System in that it will not transfer data directly to the proposed Battle Command System being developed under DMO Project Land 75; and no overarching architectural guidance for development of Battlefield Command and Control systems.

2.43 In March 2005, the DMO proposed that the FMS agreement be increased to include a Battle Management System. The preferred system was one that was already manufactured by the US, and integrated to ABRAMS tanks, thus reducing integration risks associated with adding the system to the tanks following the AIM remanufacturing process.⁷³

2.44 There were two alternatives proposed for consideration: a system that relied on L-Band satellite communications, known as the Force XXI Battle Command Brigade and Below (FBCB2) and Blue Force Tracking (BFT) system (FBCB2-BFT); and a system that relied on Ultra High Frequency line of sight terrestrial communications, the FBCB2 Enhanced Position Location Reporting System (FBCB2-EPLRS).

2.45 In considering the selection of a Battle Management System, the DMO noted that the selected system would be an interim capability until replaced by DMO Project Land 75 Battle Command Support System between 2009 and 2011. The interim system is not intended to interface with any existing ADF system, however the DMO advises that it is capable, with software modifications, of supporting a Variable Message Format System in the future, should a system of this nature be procured for use as the preferred Defence Network Centric Warfare data communications system.⁷⁴

2.46 The DMO advises that the Defence Chief Information Officer's Group first became aware of the acquisition of the BFT capability in January 2006. By October 2006, a decision had been made to acquire off-platform communications services for a new Battle Management System capability for Army, at an estimated project cost of \$2.8 million. Defence advised the ANAO in June 2007 that in April 2007 the mandate for the project to implement off-platform communications services for a new Battle Management System Capability was changed to provide a temporary (one year) end-to-end service at a cost of \$3.3 million.

2.47 The initial capability was required to be in place by mid January 2007,⁷⁵ and was to be improved to include more robust communications, a second

⁷³ A Battle Management System provides a voice, data and situational awareness communication system to enable tank communications.

⁷⁴ Defence advised the ANAO that the Chief Information Officer Group has been tasked to implement what will result in a three step implementation of BFT. Step one is the temporary satellite based system for up to a 12 month period. Step two is an interim solution that may or may not be satellite based (a project definition study will identify a preferred interim solution), and step three is the LAND75 solution.

⁷⁵ This interim capability is a temporary, stand alone system, used for training and exercise purposes, within continental Australia for a period of three years. A replacement system is envisaged to be introduced into service via DMO Project Land 75–Battle Management System, to develop the capability through integration with strategic Command and Control systems.

ground station and a Data Fusion Centre at a Defence location by mid June 2007.⁷⁶

2.48 In January 2007, the Defence Chief Information Officer Group advised the ANAO that a contract to provide satellite and associated services would be delayed.⁷⁷ The Defence Chief Information Officer Group intends to have a temporary end-to-end services solution in place by July 2007 which will operate for 12 months.⁷⁸ In parallel to the implementation and operation of the temporary system, a Project Definition Study will determine the best method of providing Blue Force Tracking capability and initialise a new project to implement an interim solution. The interim solution will remain in place up to the implementation of the solution provided for by DMO Project Land 75.⁷⁹ The delay associated with delivering of this service has been reported by Army to have adversely affected the training schedule being implemented by Army.⁸⁰

The materiel acquisition agreement

2.49 The Materiel Acquisition Agreement defines the Measures of Effectiveness against which the DMO are to deliver for Project Land 907 Phase 1, which have been tabularised at Table 2.3. These Measures of Effectiveness contribute to the measurement of the success of the project, in terms of delivering the capability that was asked for. The status of those requirements has been articulated in Table 2.3.

⁷⁶ Defence advised the ANAO in June 2007 that the initial service was required by mid January 2007, and was to be improved by mid June 2007. However, since then, due to funding and other constraints, the project mandate has been amended. The current project mandate for 0506-P118 Phase 1 does not include a mature data fusion capability or redundant communications link. Phase 2 will be a PDS to inform the development of an intermediate solution for FBCB2 connectivity for Defence. A mature Joint Blue Force Situational Awareness capability for Defence is likely to be a major capital project requirement inclusion into the DCP.

⁷⁷ Delays associated with providing the service have included negotiations associated with deciding the level of contracted service, regulatory compliance issues, and the ability to import the required equipment.

⁷⁸ Defence advised the ANAO in April 2007 that the delay to the FBCB2 BFT component for LAND 907 has been caused by continued contract negotiations between Defence, OPTUS and the equipment supplier to ensure the ADF gets the service it needs to provide the off-platform support for provision of FBCB2 BFT connectivity. Also there have been several issues associated with releasing the equipment to either the ADF or OPTUS, given such equipment is subject to US Government restrictions.

⁷⁹ The provision of Satellite services is contingent on the Defence Chief Information Officer signing a service delivery contract with an L-band satellite communications service provider, which was anticipated to have been delivered by August 2006. A revised date for this access is now July 2007.

⁸⁰ In November 2006, Army advised the Defence Chief Information Officer Group that delays associated with delivering the required satellite connectivity will have an unacceptable impact on the Introduction Into Service of the ABRAMS capability, and programmed support to mission rehearsal exercises for deploying force elements.

Table 2.3

Materiel Acquisition Requirement Status—February 2007

Materiel Acquisition Requirement	Project Status
59 M1A1 AIM Main Battle Tanks.	Delivered to Schedule.
seven M88A2 Recovery Vehicles.	Delivered to Schedule.
An Introduction into Service Date of 31 December 2007, ⁸¹ with a Capability Acceptance Date of 31 December 2010.	To be delivered.
All personnel have the required competencies to perform the functions of their positions.	Achieved.
Any facility requirements are met within schedule, noting the cost limitations and reliance on agencies external to the DMO in this area.	Some delays have been experienced, although training is continuing. As of March 2007, facility delays had not adversely affected training, or the delivery of the capability.
Simulation systems are installed and operational at the School of Armour and 1 st Armoured Regiment.	Achieved.
Army's tank transport and fuel distribution capabilities are enhanced by up to eight fuel trucks and up to 14 tank transporters.	Support vehicles delivered to schedule.
Sufficient tools, test equipment and repairable items are purchased to ensure operational capability.	Achieved.
Training and war stock ammunition has been purchased and deemed suitable for service by the Ordnance Safety Group, noting the cost limitations and reliance on agencies external to the DMO.	Achieved.
The project meets and complies with environmental regulations, noting the cost limitations and reliance on agencies external to the DMO.	Achieved.
The project complies with the Technical Regulatory Framework.	Delivery and Acceptance testing is being managed to deliver a compliant capability.
Through-life support strategies have been developed and implemented.	Through-life support strategies are being developed.

Source: ANAO analysis of DMO and Defence reference material

⁸¹ The Defence Capability Development Manual states that the In-Service Date is that point in time that symbolically marks the beginning of the transition of a capability system, in part or in full, from the Acquisition Phase to the In-Service Phase, and coincides as closely as practicable with Initial Release (which is the milestone at which the Capability manager is satisfied that the initial operational and materiel state of the capability system, including any deficiencies in the Fundamental Inputs to Capability, are such that it is safe to proceed into a period of Operational Test and Evaluation, leading to an endorsed capability state).

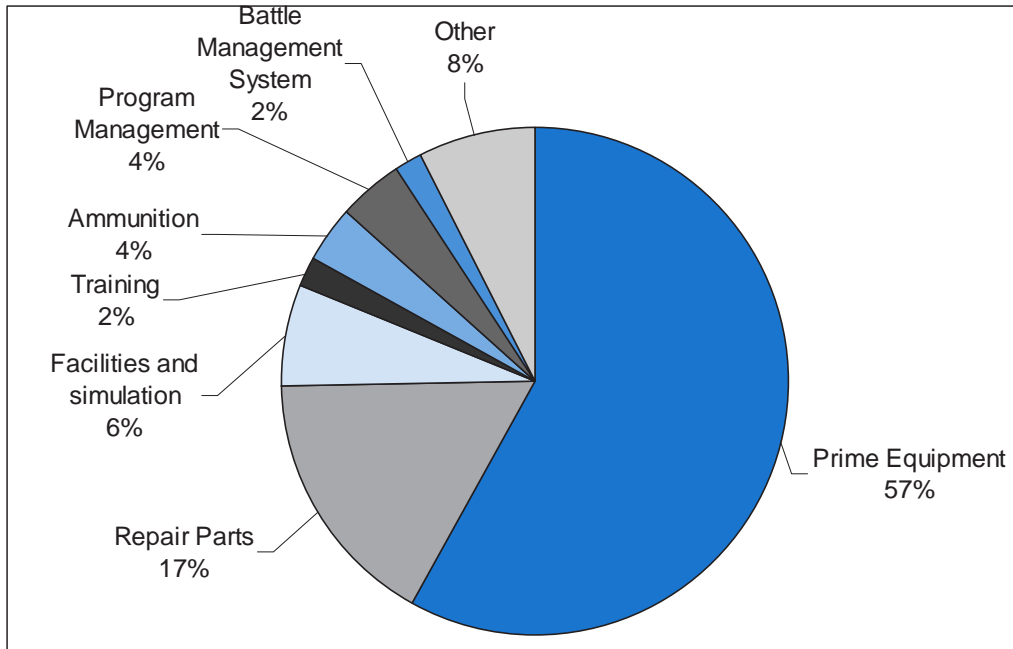
3. Acquisition Management

This chapter provides an overview of the Foreign Military Sales Programme, including contract and financial management of the project.

Overview

3.1 The delivery of the ABRAMS tanks, trainers, and armoured recovery vehicles is being managed as a single FMS agreement (the Prime FMS Contract), through the FMS Programme, and was signed on 25 June 2004. The acquisition of the ABRAMS M1A1 AIM Tank Battle Management System is being managed separately, through its own FMS agreement and the acquisition of the heavy tank transporters and fuel trucks is being undertaken using commercial contracting arrangements. The total budget, as of February 2007, is \$555 million.

3.2 Of the total allocated budget, DMO documentation indicates that some 57 per cent is expected to comprise the prime FMS agreement, with around two per cent allocated to the secondary FMS project (the Battle Management System). The remainder, as illustrated in Figure 3.1, is expected to be made against a range of requirements associated with acquiring the capability.

Figure 3.1**Project Land 907 Approved Funding Allocation**

Note: Other costs include; Engineering; Specialist Tools and Test Equipment; Storage and Transportation; Acquiring Documentation; Maintenance; Field Services Representatives; Disposal; and Foreign Exchange Rate Gains.

Source: DMO Documentation

Foreign military sales contracts

3.3 The FMS Programme is a key means by which the Australian Government procures military goods and services, directly from the US Government. One of the conditions to any FMS acquisition is that quotes cannot be sourced from both the US Government (under the FMS Programme) and commercial channels, as the US Government will not compete with its own industrial base.

3.4 The Letter of Request and the Letter of Offer and Acceptance represent the formal basis for establishing an FMS agreement.⁸² Together, these documents constitute a Memorandum Of Understanding between the Australian and US Governments. Subject to US Department of Defense approval, a Letter of Offer and Acceptance is provided for consideration by

⁸² The purpose of the Letter of Request is to request Defence articles, military construction, and/or services from the US Government.

Defence, and if accepted, the acceptance letter commits the Australian Government to the FMS agreement, on the condition that all prices quoted within the Letter of Offer and Acceptance are understood to be estimates.

3.5 The US Government stipulates, as part of the FMS Programme, that items procured through FMS arrangements may be furnished from existing stocks, or procured under terms and conditions consistent with US Department of Defense regulations and procedures. A standard condition in a Letter of Offer and Acceptance is that the US Government reserves the right to cancel or suspend all or part of an FMS agreement at any time prior to delivery, under unusual or compelling circumstances, when the national interest of the US requires.

Financial management

3.6 *The US Arms Export Control Act* requires that a country's FMS Programme be managed at no cost to the US Government. As a consequence, the procurement of goods and services must, by US law, include requirements for advanced payments. The impact of this is that, the DMO undertakes to meet all costs, including indirect and overhead costs, irrespective of the signed, initial agreement value.

3.7 The DMO Foreign Military Sales Financial Management Manual notes that FMS payments are processed through the following bank accounts:⁸³

- Reserve Bank of Australia FMS Account (Australian Department of Defence Account) with the Federal Reserve Bank of New York. The function of the account is to allow Defence to deposit sufficient cash funding for approved FMS purchases, such as Project Land 907. The US Department of Defense draws down funds from this bank account in accordance with the procurement need and deposits the funds into the US Department of Defense FMS Trust Fund. Funds are held in the Reserve Bank of Australia FMS Account, which is interest bearing, until required for payment by the US Government for FMS suppliers. The interest earned in this bank account is paid to the Australian Government Consolidated Revenue Fund.

⁸³ Financial arrangements of these accounts between US Department of Defense and the Department of Defence are outlined in the *Tripartite Agreement Concerning Foreign Military Sales Financing by the Government of Australia* and various correspondence between the US Department of Defense, and the Australian Department of Defence.

- US Department of Defense FMS Trust Fund (a US Government Account). Payments to FMS suppliers are made through this non-interest bearing account. Draw downs from the Reserve Bank of Australia FMS Account to this Trust Fund occur on a bi-monthly basis in order to minimise the level of funds held in this account.

3.8 To give effect to the FMS Programme, Australia is required to maintain a balance of cash in the US Federal Reserve Bank Account of New York that covers the termination liability and about three months advanced payments.⁸⁴ This amount is adjusted, as contracts are awarded and as work progresses. In addition, the Bank Account is required to hold an amount that equates to approximately four months financial activity at the commencement of each quarterly period. The estimates are based on prior activity, and are drawn down upon as work is undertaken (disbursements).

3.9 At any one time, Defence (at the time of audit fieldwork, Defence had not arranged transfer of the Bank Account to the DMO) has upwards of US\$ 80 million in advance payments in the FMS Trust Account, negating the requirement to make large deposit payments when the Letter of Offer and Acceptance is accepted. As at 28 February 2007, the balance of the Reserve Bank of Australia FMS Account was US\$ 207 million.

3.10 Figure 3.2 illustrates the FMS cash flow system, against which the US Government takes payment. The ANAO requested the DMO provide the drawing rights for these accounts in April 2007. The DMO was not able to provide a copy of the drawing rights for these accounts.⁸⁵ The ANAO was advised by Defence in late June 2007 that:

The FMS bank account with the Federal Reserve Bank, New York, was managed by Defence until 1 May 2007. The drawing rights were therefore Defence's responsibility.

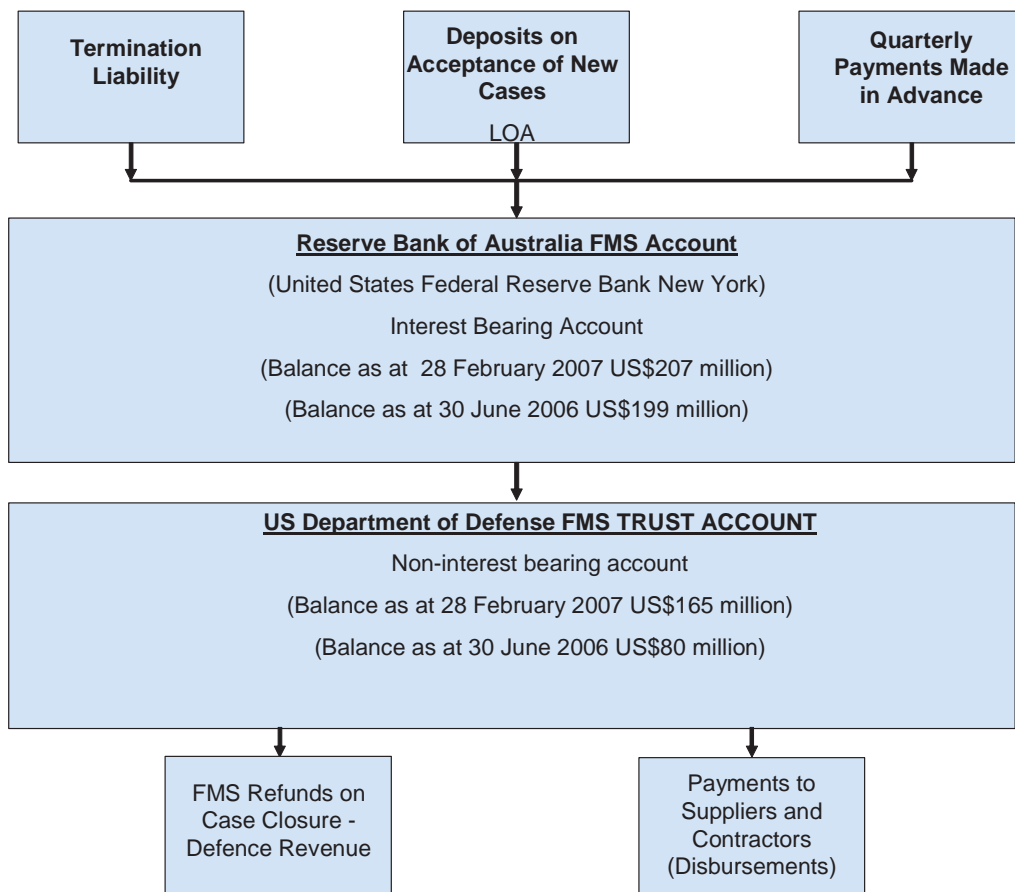
⁸⁴ The termination liability is defined by the FMS agreement, which usually covers the full costs of the entire agreement value.

⁸⁵ Section 26 of the *Financial Management and Accountability Act 1997*—Part 4 Division 2 mandates that: An official or Minister must not do any of the following except as authorised by a valid drawing right:

- (a) make a payment of public money;
- (b) request that an amount be debited against an appropriation;
- (c) debit an amount against an appropriation.

Figure 3.2

Foreign Military Sales Cash Flow System



Source: Defence

3.11 FMS Financial Managers⁸⁶ are required to maintain accurate and accessible records in order to facilitate prompt acquittal, agreement closure, and to satisfy internal and statutory reporting obligations. FMS Financial Managers are also required to periodically review the funding level of all their agreements, to take account of exchange rate movements and other variables, and take action when necessary to ensure that sufficient funds are available, to allow future payment recommendations to be actioned.

⁸⁶ The DMO Chief Finance Officer's (CFO) Group is responsible for the Financial Management of FMS. Estimates of the quarterly FMS payments are developed by individual FMS agreement managers based on historical data, anticipated deposits and refunds, and projections of FMS activity. These estimates are then consolidated.

3.12 The DMO advised the ANAO that, the nature of the FMS Programme is such that it does not allow for a detailed break down of expenditure against work performed.⁸⁷ However, as of late November 2006, the prime FMS contract covering the tanks, trainers, and armoured recovery vehicles, had incurred expenditure of US\$ 236.2 million of a total FMS estimated agreement value of US\$ 302.95 million.⁸⁸

Battle Management System FMS Agreement

3.13 As of late November 2006, Defence had incurred expenditure of US\$ 2.33 million of a total estimated FMS value of US\$3.78 million for the work conducted against the Battle Management System FMS agreement. The ANAO notes that this leaves approximately 38 per cent of the value of the contract outstanding at the time of audit fieldwork, with \$430 868, or 11 per cent, worth of equipment delivered. Total payments for this FMS agreement are expected to include around US\$144 000 in administrative costs.

FMS equipment acceptance management

3.14 Equipment delivered as part of an FMS agreement is inspected, and certified by the US Government to meet their standards at the time of delivery.

3.15 The ANAO reviewed the Field Inspection Check Sheets associated with the selection of each tank being procured by Defence. The inspection constituted an inventory of equipments undertaken by US Defense staff, and was not a comprehensive analysis of the state of each tank prior to selection for rebuild under the AIMS programme.

3.16 The DMO advised the ANAO that the inspection was used as a discriminator to eliminate vehicles that had major and expensive components missing. For example, one vehicle was missing an entire nuclear, biological and chemical safety system, and was removed from the list of 59 for consideration. The ability to screen specific tanks served as a cost-savings measure for the DMO, noting that the AIMS programme would have replaced missing parts to ensure that final product met specification, at the DMO's cost.

⁸⁷ The DMO advised the ANAO that, Defence effectively owns the tanks as soon as the FMS agreement is implemented, therefore full payment to the FMS agreement is required, despite the deliverables not being receipted by Australia.

⁸⁸ Defence advised the ANAO that the second FMS agreement includes the provision of off-platform equipment intended to be used by the Chief Information Officer Group in provision of the off-platform capability. However, errors in the FMS agreement have resulted in this equipment not being made available for sale at the stated price. Consequently, the full value of the FMS agreement will not be realised and Chief Information Officer Group must seek alternate methods for obtaining the equipment.

3.17 Subsystem design acceptance testing (for equipment such as the radios, and the Battle Management System) was being finalised at the time of audit fieldwork in early 2007. In addition, all major platform Design Acceptance testing had been completed, following trials undertaken by the US Government. Whole of capability Operational Test and Evaluation is scheduled to be conducted in concert with collective training,⁸⁹ utilising the entire capability, and is scheduled for completion by June 2007, prior to the planned capability acceptance date in July 2007. Follow-on testing incorporates the following Critical Operational Issues:

- Army organisational structures required to support the capability;
- costs of operation of the capability;
- training throughput and staff availability to support the capability;
- suitability of the expected support requirements to meet operational demands;
- deployability;
- refuelling capability with the new refuellers;
- survivability associated with non-depleted uranium armour;
- close range infantry support capacity; and
- interoperability with ADF units.

Commercial contract management

Heavy Tank Transporters

3.18 As part of Project Land 907, the DMO was to procure up to 14 heavy tank transporters for the transport of Main Battle Tanks and M88A2 Hercules Armoured Recovery Vehicles. The Acquisition Strategy for this project states that the heavy tank transporters are not intended to be a deployable system, however, their timely delivery was deemed to be a key element of the successful introduction of the complete tank capability.

3.19 In October 2004, Defence issued a Request For Tender to ascertain appropriate suppliers. The submission close date was 15 December 2004, with all five submissions received prior to the required date. In May 2005 a contract

⁸⁹ Collective training involves the use of multiple tanks in formation, as if deployed to accomplish an operational task.

was signed with MAN Military Vehicle Systems Australia PTY Limited to deliver 14 heavy tank transporters by 30 June 2007. A key component in selecting MAN was that it could supply the required quantity of heavy tank transporters and associated repair and maintenance support for three years within the project budget, at a total cost of \$17.37 million.

3.20 The contract required delivery of the first three heavy tank transporters systems and 'train-the-trainer' training before 1 October 2006, and to obtain final acceptance of supplies, excluding repairs and maintenance support, prior to 30 June 2007. The final contract included a provision for a maximum amount of \$16 million of Liquidated Damages to be recoverable from the Contractor in the event of delays. This constitutes some 92 per cent of the total contracted value and significantly mitigates the risk of schedule delay.

3.21 As of March 2007, the DMO had formally accepted 13 heavy tank transporters. The delivery of the fourteenth heavy tank transporter was effected in April 2007, two and a half months ahead of schedule.

Tactical fuel trucks

3.22 Defence identified a requirement to acquire eight 'R-Series' Mack Truck Variants', converted to satisfy the fuel requirements of the ABRAMS tank. Once operational, the tactical fuel trucks are scheduled to remain in service until 2011–15, when they are scheduled to be replaced by a new capability.

3.23 To take advantage of existing capabilities, Defence decided that the tactical fuel trucks would be rebuilt from surplus Mack Army equipment, identified by Army Headquarters.⁹⁰ This rebuild took place through an existing sole source contract that Defence had with Mack Trucks Australia, which included an 'Option for Further Quantities' clause in the contract.⁹¹ The DMO advised the ANAO that the decision to sole source the acquisition was based on Mack's ownership of the intellectual property rights associated with

⁹⁰ The Land 907 element of the contracted work was managed as an extension of an existing Land Vehicles System Programme Office contract for the provision of fuel trucks from Project Land 907 funding. Defence advised the ANAO in June 2007 that the cost was paid directly by Land 907, and there was no inter-project transfer of funds.

⁹¹ As a consequence of the July 2002 Minor Capital Programming Committee it was confirmed that the budget year was under programmed by some \$23 million. In an effort to develop a program consistent with the current agreed level of over programming, Army and DMO staff developed a series of fleet replacement and enhancement proposals totalling an additional \$34.5 Million (2002 dollars) that could be achieved in 2002–03. In response to this requirement Defence entered into a contract with Mack trucks in December 2002 to have eight dump truck Mack Trucks converted to tanker fuel specification and four to truck tanker water specification, at a total cost of \$4.7 million (2002 dollars).

the units. The additional purchase for Project Land 907 was included in the current order and achieved through an inter-project funds transfer.

3.24 In December 2004 Defence formally entered into a sole source contract with Mack Trucks Australia Pty Ltd for the delivery of an additional eight trucks (as Government Furnished Equipment) including associated training, at a total cost of \$4.7 million, to be delivered no later than 31 October 2006. To date Defence has expended approximately \$2.5 million against the contract and has formally accepted all eight tactical fuel trucks delivered individually from late February 2006 to early October 2006.

3.25 The contract included a provision for liquidated damages to be recoverable from the Contractor in the event of late delivery. The contract notes that Liquidated Damages will be applied in each instance once delivery is delayed beyond five working days from the delivery date specified in the contract. The contract states that the Goods and Services Tax inclusive amount of liquidated damages will be \$1000 per day in total for each working day of the delay. This constituted an effective risk mitigation strategy, and no delay was experienced from this contract.

Risk management

3.26 In July 2004, the DMO Project Assurance Board for this project noted that, even though a risk log had been created, covering a number of cost and schedule risks, some of the assessments did not seem to align fully with the latest information held to hand. The Governance Board noted that Project Management and the Risk Log were not fully integrated, and the assignment of contingency and schedule float to the key risks identified had not been completed. The Governance Board noted that, inter alia, a residual risk concerning risk planning existed.

3.27 The ANAO reviewed the risk management system and risk log being used by the project in late 2006, and noted that, even though the plan was still in draft form, the risk log that supported the plan reflected the Project Office's Critical Success Factor for the project; which is the delivery of the capability within the allocated project budget and schedule, and the ongoing provision of the capability until its eventual replacement.

3.28 The draft Risk Management Plan does not specify the use of then specified DMO standard Risk Management System (RMS2) as the method by which risk should be identified, and managed, in terms of allocating

contingency costings to risks (known as assigned risks).⁹² The Project Office has chosen instead to use an EXCEL spreadsheet, which: identifies and classifies risks; specifies the treatment to be undertaken for that risk; and keeps track of the management of that treatment. The management of assigned project contingency against identified risks could be strengthened by allocating budget to specific risks, rather than broad risk categories,⁹³ on a time managed basis, for the period the risk is prevalent.⁹⁴

Contingency management

3.29 The DMO Finance Instruction relating to the management of contingency budget notes that it is required to allow for sufficient funds to be available to cope with any contingency events that may arise during the conduct of the project. The Finance Instruction notes that the contingency is to be supported by contingency planning intended to ensure the project is able to accommodate the occurrence of any risk events, and is to be formalised in a contingency plan. There was no contingency plan in place for this project.

3.30 The DMO Finance Instruction specifies the management of contingency in terms of whether it is assigned, or unassigned.⁹⁵ The ANAO reviewed the management of contingency, and noted that, of the initial contingency budget of \$58.01 million; \$15.04 million was used to fund a price increase for the Very High Frequency (VHF) radios used on the tanks; \$0.82 million was used to fund the Skilling Australia's Defence Initiative; \$5 million was used to cater for

⁹² The RMS2 system, whilst not linked to the scheduling system used by the Project Office, does afford the ability to allocate contingency funding to specified risks over a specified period. Contingency that remains available for use with unanticipated risks is known as unassigned contingency. RMS2 was, at the time, the specified Defence Risk Management Tool.

⁹³ The current management of contingency is spread across broad areas of risk, such as the prime equipment, facilities, travel, and, amongst others, through-life support, which alone accounts for \$A9 million of contingency provision.

⁹⁴ As an example, the ANAO notes that the contingency log allocates \$A2.145 million of contingency risk to the prime equipment for the period of the contract, in an effort to cater for real cost variations experienced through the FMS acquisition management case, or for additional requirements being placed on the project. One of the risks identified in the risk log is that the project will be directed to procure Tank Urban Survivability Kits (TUSK) without provision of additional project funds, a risk that attracts a classification level of HIGH. The risk log does not allocate a dollar value to this risk, nor does it limit the risk to a specific period in the project schedule, so it is unclear whether contingency funds will be available to cover the risk at that particular time, given other risks that may or may not eventuate before hand. The contingency log records a transfer of \$A10 million for the provision of TUSK, however no TUSK equipment was procured, and the FMS case was not updated to reflect the requirement to deliver TUSK equipment.

⁹⁵ At any point in time, the contingency budget will comprise: the initial Contingency Budget identified in the project approval documentation; the net variations to the contingency budget, approved as part of project real cost increases and decreases; budget transfers from contingency to project work breakdown structure element budgets through application; and transfers of budget from work breakdown structure element budgets to contingency budget through budget return.

a price increase associated with the Battle Management System; \$10 million has been allocated to provide for the delivery of a Tank Urban Survivability Kit capability;⁹⁶ and \$5.23 million was used for providing work breakdown structure budget increases associated procuring rotatable repair parts.

3.31 Throughout the project elapsed time, a number of price adjustments have been made to cater for inflation. The remaining contingency totals \$27.75 million, which is broadly allocated to project risk areas, and is treated as unassigned contingency. Detailed cost analysis of risks associated with specific Work Breakdown Structure elements has not been undertaken.

3.32 The identified known risks carried by the Project Risk Log have not been fully costed, and contingency has not been allocated to the individual lower level Work Breakdown Structure elements.⁹⁷

Australian importation requirements

3.33 In December 2006, the ANAO noted that the declared Customs values associated with the importation of the first batch of 18 tanks, and five recovery vehicles in September 2006 were reported as \$43.09 million, which was not representative of the purchase values of the vehicles. The Customs Declaration Form, submitted as part of the importation process for the tanks understated the value of the 18 tanks and the five transported Hercules Recovery Vehicles imported in September 2006 by some \$91.56 million.⁹⁸

3.34 The *Customs Act 1901*⁹⁹ contains the legal rules for arriving at the valuation of imported goods.¹⁰⁰ The ANAO also notes that there was a corresponding error associated with the DMO Business Activity Statement for the period, and of the monthly importation figures calculated by the Australian Bureau of Statistics for national accounts purposes for international trade in goods and services.

⁹⁶ The ANAO notes that there is no existing requirement for this equipment in any of the capability, or FMS agreement documents either prior to, or following the allocation of contingency to the provision of the equipment.

⁹⁷ The DMO advised the ANAO in March 2007 that contingency is allocated against specific areas of risk in Land 907 Contingency and Risk Logs. The ANAO notes that these areas are very broad categorisation of risk areas, and have not been broken down to cater for individual project events and deliverables.

⁹⁸ The reported Goods and Services Tax for this transaction was based on the declared import value, undervalued, and should have been calculated to reflect the correct import value of the Goods and Services being received.

⁹⁹ *Division 2 of Part VIII (sections 154 to 161L) of the Customs Act 1901.*

¹⁰⁰ A false or misleading statement, not resulting in loss of duty, may have been made to Customs (see *Customs Act 1901 Section 243U*).

3.35 The DMO advised the ANAO that an amendment to the declaration was lodged with Customs in mid February 2007, which represented the importation value of the shipment as \$134.65 million. In addition, the DMO advised the ANAO that the Goods and Services Tax liability arising from the Post Warrant Amendment will be recognised under the Customs Deferral Scheme and the Input Tax Credit will be acquitted under standard Business Activity Statement lodgement procedures.

Insurance management

3.36 The ANAO reviewed the management of the transportation of the first delivery in September 2006 of ABRAMS tanks and Hercules Recovery Vehicles from the US to Australia.¹⁰¹ Of note is that the Project Office sought advice pertaining to insurance for the transport of this equipment via a commercial shipping agent, and were advised by the Australian Embassy in Washington DC that,¹⁰² 'marine all-risks' insurance is very expensive and that the risk of loss is very low. The Project Office was informed that any risk of loss is mitigated by the selection of the carrier which has a high reputation for its standard of vessels and practices and is security-cleared.

3.37 The ANAO understands that no actual costings associated with providing insurance cover were sought by the Australian Embassy in Washington DC. The DMO advised the ANAO that:

moving the tanks by ship effectively represented little more risk than transport by road within Australia. In those cases, we self-insure. The risk of damage was mitigated by the preparations that were made in securing the tanks on the ship and the use of escorts to monitor movement during the voyage.

3.38 COMCOVER provided advice to the ANAO in late 2006 associated with the indicative costs to arrange insurance for the purchase value of an example shipment of Specialist Military Equipment, to the value of

¹⁰¹ The Defence Procurement Policy Manual version 5 of June 2004 provides guidance regarding the types of insurance policies available once formal risk assessment has been completed. In addition, the DMO Project Risk Management Manual refers to the provision of insurance, arranged through COMCOVER rather than through the prime contract, as a risk treatment strategy. COMCOVER is part of the Department of Finance and Administration and operates a self-managed insurance fund for Australian Government agencies.

¹⁰² The Defence Insurance Office is responsible for managing Defence's insurance administration, including the provision of technical advice in Defence and claims management services on behalf of the Department. Defence has insurance policies with COMCOVER for such things as property loss or destruction, director's and officer's liability, motor vehicle accidents, third party injury and third party property damage. The Office also provides a range of insurance-related services including access to industry specialists and advisors for project-specific advice.

\$90 million.¹⁰³ The COMCOVER advice noted that the total loss only coverage¹⁰⁴ for \$90 million of Specialist Military Equipment was of the order of \$63 000 to \$135 000, with a deductible range of \$9 million to \$0.9 million.¹⁰⁵

3.39 The ANAO considers that the DMO would benefit from promulgating the processes that project managers are required to take into account when calculating and considering risks and appropriate mitigation strategies associated with using commercial shipping to transport major capital equipment acquisitions.

¹⁰³ This purchase price was calculated using the Letter of Offer and Acceptance prices, quoted in US dollars, and applying the exchange rate , which was 0.7682, to calculate the manifest value.

¹⁰⁴ Statistics released by the International Union of Marine Insurance, which represents marine underwriters worldwide, indicate that 67 ships (of 500 gross tons and over) were total losses in 2006. The 2006 losses equate to approximately 0.1 per cent of the world fleet, compared to 0.3 per cent in 1996 and nearly 0.5 per cent in 1990.

¹⁰⁵ The deductible amount is the cost to the Australian Government for each claim made, prior to the insurer covering any loss claims. Typically, the higher the deductible amount, the cheaper the coverage.

4. Through-Life Support

This chapter reviews the through-life support considerations associated with the ABRAMS capability, associated interoperability and infrastructure.

Safety management and design acceptance

4.1 Safety management is intrinsically linked to the design acceptance processes for new platforms.¹⁰⁶ The award of design certification requires a progressive level of informed assessment of the safety level associated with the new capability. In addition, specific safety case documentation is developed to identify and manage known risks, prior to final design acceptance. The design acceptance of the tank and recovery platforms is being progressed using three key milestones, which include:

- Provisional Design Acceptance Phase One, which was undertaken prior to the initial delivery of ABRAMS vehicles to Australia, and is granted on the basis of a desk top study of safety, performance and environmental data. This level of acceptance was provided to facilitate training in the US, and transportation of the vehicles to Australia in September 2006.
- The initial DMO plan was to issue the Provisional Design Acceptance Phase 2 prior to commencing training. The decision was taken by the Project Office to extend the scope of Provisional Design Acceptance Phase 1 to include the design acceptance provisions required to commence training in Australia. Provisional Design Acceptance Phase 2 will be issued to retire concessions that were prevalent when the Provisional Design Acceptance Phase 1 was issued. Award of Provisional Design Acceptance Phase 2 consist of a physical safety audit, retirement of ordnance related concessions, and a deeper understanding of the systems. This level of design acceptance requires the provisional acceptance of all of the sub-systems including ammunition, weapons, the communication system, and the Battle Management System. As at the time of fieldwork, Provisional Design Acceptance Phase 2 had not been granted.

¹⁰⁶ The engineering activities required to introduce a capability into service include Design Acceptance, Safety Management, Test and Evaluation, Configuration management and Quality Assurance and Defect Investigation. Through management of these activities, a new capability can be demonstrated to be both compliant with extant engineering standards, and safe for operational use when introduced into service. The DMO manages the assessment of new capability against the required standards via a series of staged, managed acceptance activities.

- Final Design Acceptance is planned to be accomplished following an Operational Test and Evaluation report fielded by Army Headquarters. The Operational Test and Evaluation report is undertaken to confirm no unacceptable safety and operational issues have been identified throughout the training phase prior to operational deployment. This Final Design Acceptance also serves to certify that Army Headquarters accepts that the capability meets with the requirements of the Operational Concept Document. Final design acceptance is planned to be accomplished during June 2007.

4.2 The Australian Safety Case associated with the tanks and Hercules Recovery Vehicles had not been completed prior to the start of training activities in Australia, using the first batch of delivered tanks.¹⁰⁷ The DMO assessed that prior acceptance by the US Armed Forces of similar platforms, in conjunction with a managed hazard assessment log and integrated instructor training by experienced US Defense Force instructors, mitigated the risks associated with using the delivered tanks in the absence of a completed Australian Safety Case.

4.3 In August 2006, the US Army provided a recommendation for a Safety Confirmation for the M1A1 ABRAMS AIM Tanks with Australian unique components, based on a series of tests with two Australian ABRAMS tanks. In doing so, the US Army concluded that: the tanks, with Australian unique components are safe for operation; the main weapon and secondary armaments are safe to fire while stationary or moving at stationary or moving targets; the laser range finder is safe to operate; and the use of the Tank Infantry Phone, located at the rear of the tank was safe, given the Tank Commander's permission has been first sought and acknowledged, and it is used when the tank is stationary.

Test and evaluation

4.4 The DMO divided the Test and Evaluation for the capability into two complementing, and overlapping phases. Phase 1 (from May 2006 to June 2007) concentrates on the Acceptance Tests and Evaluation, while Phase 2 (from February 2007 to June 2007) is concerned with Operational Testing and Evaluation. The endstate of Phase 1 is Design Acceptance, while the endstate of

¹⁰⁷ The safety case for the Hercules Recovery Vehicles was approved in November 2006. Of the managed safety issues identified, the ability to ford deep water (1.4m to 2.2m) presents a tangible risk to operators through suffocation. The Recovery Vehicles' Safety Case recommends the use of night vision equipment as standard practice in reduced light scenarios.

Phase 2 is Operational Release, which means the capability is able to be deployed operationally. At the time of audit fieldwork, neither Design Acceptance, nor Operational Testing and Evaluation had been completed.

4.5 The DMO note that the 'Military Off-The-Shelf' nature of the project, and the very tight procurement schedule precluded the opportunity to conduct any Test and Evaluation on either the ABRAMS tanks, or the recovery vehicles before taking delivery, and then, until training commenced. Test and Evaluation is being undertaken in conjunction with training.¹⁰⁸

US engineering assistance

4.6 The US Government assists Defence by providing the benefits associated with advice flowing from field problem review boards, and system safety working groups in the US, based on operational management of the US, and all other national ABRAMS fleets.

4.7 The benefits associated with this arrangement alert the DMO and Defence to emerging issues that may impact on current, and future maintenance, safety and operational issues.

Interoperability considerations

4.8 The Operational Concept Document prepared prior to Government approval interpreted interoperability to mean the successful provision, exchange and acceptance of ammunition, fuel, information, medical support and lift (operational and strategic) within an American, British, Canadian, or Australian environment, in accordance with mission specific rules of engagement and Australian Government guidance.

Transport options

4.9 In September 2006, the Minister for Defence announced that the options for transporting the tanks included C-17 heavy airlift aircraft; amphibious ships; the Adelaide to Darwin rail network; and the new tank transporter trucks. The DMO advised the ANAO that road transport arrangements for the ABRAMS tanks and Hercules Recovery Vehicles provides an ability to deliver

¹⁰⁸ The Project Office intends to implement a configuration audit programme to ensure the configuration of Australian tanks is maintained in accordance with the approved baselines. Configuration changes to platforms are authorised by the Programme Manager after design acceptance by the Design Acceptance Authority Representative. Requests for configuration changes, including changes to maintenance, repair and operator documentation are to be endorsed by the unit commander and submitted to the Programme Manager Tank for consideration.

the tanks and recovery vehicles to all of the areas where Leopards would otherwise have been transported, as illustrated at Figure 4.1.

Figure 4.1

Tank Transporter with embarked Australian ABRAMS Tank



Source: Defence

4.10 Where roads and bridges have total weight limits less than the combined weights of the transport truck and load, the ability to transport the tanks and recovery vehicles across these particular bridges may be impaired. However, the Project Office advised the ANAO that any such restrictions have not compromised the ability for Defence to deploy tanks and recovery vehicles to meet their current operational, training, equipment relocation and maintenance requirements, which remains contingent on the existing Environmental Clearance Certificate, as issued in September 2006.¹⁰⁹

¹⁰⁹ In March 2007, the DMO advised the ANAO that Defence will seek standing permits for some configurations of the heavy tank transporters, as well as seeking coverage in the Defence Force Road Traffic Exemption Framework that aims to standardise permit requirements in all states for military vehicles and approve use of specified routes without the requirement to seek permits each time.

4.11 Road Permits were acquired to move tanks in Victoria, in preparation for the first delivery of vehicles in September 2006. The trailer and prime mover loadings do not exceed stated maximum allowable limits, with the Gross Vehicle Mass, when loaded, being 97.2 tonnes for the ABRAMS load, and 98.7 tonnes for the M88A2 load, which are both below the total Gross Vehicle Mass maximum design weight of 110 tonnes.¹¹⁰

4.12 Special, built to order rail carriages are being investigated by Defence as part of an ADF Rail Study to assist with carrying the new capability to and from maintenance activity centres, and other sites as required. The ANAO was advised by Army that long range transport via rail is preferred to road, and reduces risks associated with accidents and equipment damage when transporting equipment between the Northern Territory and southern training and maintenance destinations. Defence advised that the rail study has been completed and that the Request for Tender for heavy rolling stock has been released. Consideration will be given to responses against that Request For Tender.

4.13 The ability to operate tactical sea lift, as is currently possible with the Leopard tanks, is not possible with existing ADF equipment. Table 4.1 illustrates the current capabilities to move Leopard tanks by sea, and the considerations or concessions required to use those same assets to move ABRAMS tanks by sea.

¹¹⁰ The ANAO was advised that Defence will seek Permits from respective State and Territory Roads Authorities, each and every time vehicles are moved on Main Roads using the tank transporter vehicles.

Table 4.1

ADF ability to land and recover ABRAMS Tanks by sea

Existing Water Craft	LEOPARD Tank	ABRAMS M1A1 AIM Tank	Comment
Landing Craft Heavy	Yes	Yes, with restrictions	The ABRAMS tanks need to be craned onboard, and also disembarked by crane. The ramp cannot be used to drive ABRAMS ashore. The ANAO has been advised that modifications to the bow ramp are to be undertaken in 2007 that will allow ABRAMS tanks to traverse the bow ramp.
Navy Landing Ship Heavy (LPA) Watercraft ^(a)	Yes	No	
Landing Craft Medium (LCM)	Yes	Yet to be confirmed	The requirement to replace the LCM8 was identified before the Tank Replacement Program was initiated. The Army has initiated a program to validate the ability to carry the ABRAMS, with the process set to be complete by June 2007.
Army Lighterage Equipment	Yes	Yes, with restrictions	This is a cumbersome operation, and not considered tactically feasible, and requires several days to set up.
Self Propelled Barge	To be confirmed	To be confirmed	
Navy Landing Ship Heavy (LPA) – HMA Ships Kanimbla and Manoora	Yes	Yes (limited by deck weight)	

Notes: (a) An LPA can only load, or unload an ABRAMS tank via its crane at some risk.

Source: Defence

4.14 Trials associated with operations involving movement of Australian ABRAMS tanks and C17 aircraft have not been undertaken. However, the ANAO were informed by the DMO and Defence that the US Government have successfully transported ABRAMS tanks using C17 aircraft.

Fuel management

4.15 The ABRAMS tanks are powered by the Honeywell AGT 1500 horsepower multi fuel capable gas turbine engine. The tank engine is capable of running on a wide range of fuel types, including diesel, with no loss in capability.

4.16 Fuel for both M88A2 recovery and ABRAMS vehicles is provided by eight Tanker Fuel Trucks. These vehicles were provided by rebuilding surplus Mack R-series chassis and fitting them with a new tank and pump assembly, using an existing design and an extant contract managed by the DMO. The DMO advise that this arrangement reduced technical, schedule and cost risks.

Maintenance arrangements

4.17 The maintenance concept for the ABRAMS tanks will consist of two levels of repair; light and heavy. The ANAO was advised that Army will continue to provide first line maintenance to its tank capability in Darwin utilising uniformed tradesmen, and in Puckapunyal utilising contracted staff, as per the current arrangement for the Leopard AS1 tanks.

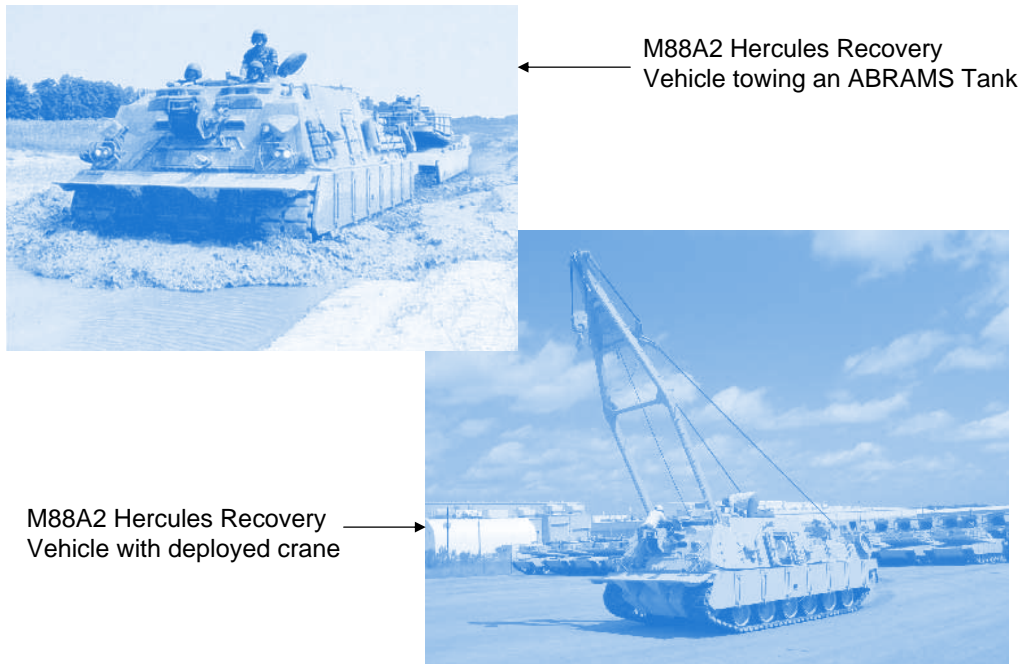
4.18 The DMO advise that heavy maintenance will be offered to industry by mid May 2007 through the release of a Request for Tender for support services.¹¹¹The stated aim of this process is to deliver the best value for money for the Government, and there is no preference or mandate for any particular geographical location.

4.19 In the immediate term, all support not rendered by Defence staff is being delivered by the US Government, via the FMS acquisition agreement arrangements. In the longer term, Defence have a preference to contract for a single supplier to deliver support services for the ABRAMS and Hercules Recovery Vehicles (see Figure 4.2) and associated support systems. This includes the maintenance and overhaul of maintenance supply items (which include repairable and rotatable items), and the associated supply support, which includes support services management, engineering support, maintenance support, supply support and the provisioning of enabling support services. A Request For Tender to seek industry proposals to support this programme of work was, at the time of completion of audit fieldwork, yet to be issued.

¹¹¹ Defence advised the ANAO that the intention to the release the Request for Tender in May 2007 has been overtaken by the recent decision to delay the release of the Request for Tender until late 2007. This delay will be mitigated through consultation with industry towards the adoption of a better performance based approach.

Figure 4.2

The M88A2 Hercules Recovery Vehicle



Source: Defence

Simulator support maintenance

4.20 The Tank Driver Trainer, and six Advanced Gunnery Training Systems are geographically located in Puckapunyal (for the Tank Driver Trainer and two relocatable Advances Gunnery Training Systems) and at Robertson Barracks in Darwin. The DMO estimated the maximum costs associated with through-life support will not exceed \$4.8 million for the first seven years. The planned life of type for the simulators is 10 years.

4.21 The DMO advise that the Original Equipment Manufacturer recommended a specific Australian firm be engaged as the sole source provider for the simulator through-life support. The DMO acquisition strategy, which was approved following Second-Pass Approval, notes that the single source arrangement is preferred because the Original Equipment Manufacturer’s arrangements with the preferred through-life support supplier would ensure long term access to the Original Equipment Manufacturer’s technology. In March 2007, the DMO advised the ANAO that the decision to engage the through-life support supplier took into account the company’s

Original Equipment Manufacturer links, intellectual property provisions and US Government recommendations.

4.22 Commonwealth Procurement Guidelines state that competition is a key element of the Australian Government's procurement policy framework, and that effective competition requires non-discrimination in procurement and the use of competitive procurement processes. In this case, the Equipment Acquisition Strategy for the simulators notes that the original US based equipment manufacturer will remain the design authority for the simulators, and irrespective of the through-life support arrangements in place, any through-life support contractor will not be able to work independently of the Original Equipment Manufacturer.

4.23 The Equipment Acquisition Strategy also states that a high level of Original Equipment Manufacturer accreditation is preferred because it will minimise Defence involvement in the ongoing management of the simulators, increase the proportion of work performed in Australia, and expand Australia's experience with these technologies. The Equipment Acquisition Strategy notes that there are several potential suppliers of through-life support, that is, companies that are managing equivalent simulators in Australia, however many of these are direct competitors of the Original Equipment Manufacturer.

4.24 The ANAO notes that by prepositioning the Equipment Acquisition Strategy for the procurement of through-life support services for the simulators to exclude competitive bids, the DMO may have diminished any potential benefits associated with seeking competition based bids from industry for the certainty associated with contractor access to the Original Equipment Manufacturer.¹¹²

Training management

4.25 The planning and integrated nature of the training to introduce the new capability, relied heavily on the ability to utilise simulation equipment. In addition, the strategy called for a progressive training plan to train Australian instructors in the USA, who were then to train Australian instructors in

¹¹² The Commonwealth Procurement Guidelines 2005 prescribe the conditions associated with direct sourcing for procurement purposes, and note that direct sourcing must not be used for the purposes of avoiding competition, or to discriminate against any domestic or foreign business and in all such circumstances, the general procurement policy framework still applies, including the requirement to achieve value for money. The Guidelines do not specifically include the reasons stated by the DMO in the Equipment Acquisition Strategy as a valid argument for selecting a sole source supplier.

Australia, and finally, train equipment operators, maintainers and logisticians in Australia.

4.26 The Project Office developed a detailed training plan, incorporating the staff, periods and skill levels required to introduce, and operate the capability through its Introduction Into Service. This plan was supported, and implemented as required to successfully deliver the new capability into service, which included the use of operational simulation equipment, which was delivered as required to meet Training Command–Army’s requirements.

4.27 In addition, the Project Office identified the requirement to provide Gap Training, which constitutes conversion training for Defence personnel who have not received Introduction Into Service Training, and posted to a unit operating the new capability.

4.28 The steady state training requirement has been mapped, and courses have been developed, and will be accepted and approved for delivery to meet projected staffing and career development requirements during 2007. The DMO did not procure the Close Combat Tactical Vehicle Training System option for the simulators, which provides for an ability to deliver tactical training at the Squadron level.¹¹³ Army advised the ANAO that the Close Combat Tactical Vehicle Training System holds the potential to further reduce track kilometres, and extend the potential life of the tanks, if procured in future as an add-on to the existing training system.

Logistics and facilities

4.29 The ANAO reviewed work undertaken by the DMO to ascertain the spare parts required to be held in physical inventory for the ABRAMS tank. The assessments were based on operating data provided by the US Government, which was quantitatively adjusted to reflect the tanks geographical dispersion within Australia, planned track mileage and the intended operating terrain. The ANAO notes that by late January 2007, some 99 per cent of the total items ordered and required to support predicted tank equipment usage rates had been shipped to Australia.

4.30 The DMO advised the ANAO in March 2007 that:

The long term financial/cost arrangements associated with supporting the capability are being developed in conjunction with the development of the

¹¹³ The Close Combat Tactical Vehicle Training System was not in the scope of the project. The DMO advised the ANAO that it concurs that there are future benefits associated with more simulation to reduce vehicle usage and increase vehicle life.

Materiel Support Agreement. The DMO note that, until such time that the final value of the Through-Life Support contract is known, and more detailed Australian operating costs are known, final figures will be unavailable.

4.31 The DMO intends to conduct the through-life support for the ABRAMS tank and the M88A2 Hercules Recovery Vehicles, utilising a mix of FMS and Australian industry involvement. As at the time of audit fieldwork, Defence advised the ANAO that this would be facilitated through a Request For Tender to seek industry proposals to support this programme.

4.32 In addition to supplying additional infrastructure required for the new capability, Defence identified existing infrastructure that required modification. The Defence Service Group undertook to deliver a range of facilities prior to the arrival of the tanks, with the remaining requirements scheduled to be complete by late 2007, at a total budgeted cost of around \$19 million.¹¹⁴ Acquiring the necessary facilities for the ABRAMS capability was stated as Army's number one facilities priority.

4.33 In December 2004, Defence split the facility requirements into two main elements: Robertson Barracks and Mount Bundy; and Puckapunyal and Bandiana. Of these projects, the Robertson Barracks/Mount Bundy element was to be managed as part of a broader Robertson Barracks upgrade project, with an initial budgeted cost to Project Land 907 of \$10.428 million, revised in February 2006 to \$11.2 million. For the Puckapunyal/Bandiana phase of the project, Defence provided an initial estimate of \$3.4 million revised in February 2006 to \$3.5 million.

Robertson barracks

4.34 Robertson Barracks will be the base for the majority of the tanks and support vehicles and equipment. The facilities provided will be for the use of 1 Armoured Regiment and 1 Combat Support Services Battalion, to support the operation and maintenance of the capability.

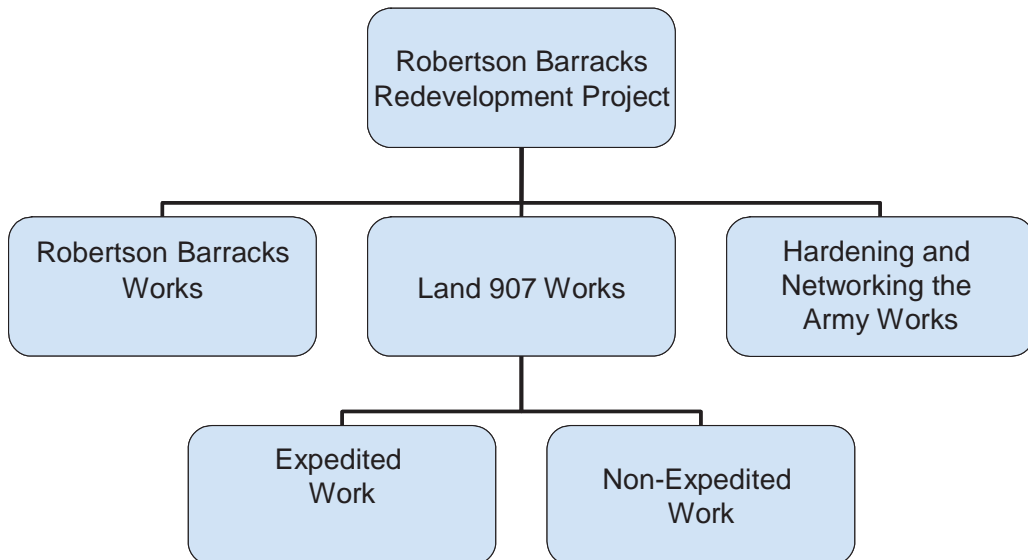
4.35 Initially, work required in Darwin was intended to be delivered as part of the Robertson Barracks Redevelopment Project, however in order to expedite the delivery of the capability, Defence sought and received Public Works Committee approval to expedite select components of the tank requirement (see Figure 4.3). The work currently underway includes; expanding the Fuel Truck parking area and providing hangars for eight

¹¹⁴ This value is at 2006 prices, including contingency amount.

vehicles; providing modifications to dehumidifiers in the tank hangars; and a refit to the unit armoury, ready for use from March 2007.

Figure 4.3

Scheduled Darwin Facility Development Activities



Source: Defence Support Group

4.36 Work yet to be completed against the tank requirement for Project Land 907 in Darwin includes: an Armoury Refit; parking for the heavy tank transporter; work to improve the engine run up bay; electronics, instruments and radio repair facilities; and the works at Mount Bundy training range, which is scheduled for completion by June 2009.

Puckapunyal

4.37 The Puckapunyal Military Area is located approximately 90 km north of Melbourne and has 42 440 hectares of land, which is dedicated to the conduct of live fire and manoeuvre training. The facilities provided are for the use of the School of Armour, to provide both individual and armoured vehicle training courses for drivers, gunners and commanders. The School will operate nine ABRAMS tanks and two Hercules Armoured Recovery Vehicles.

4.38 Defence conducted the acquisition to acquire the facilities required for the tank capability through a medium work project.¹¹⁵ A Project

¹¹⁵ A medium work project is more than \$250 000 but currently less than \$6 million, with this limit rising to \$15 million in 2007.

Manager/Contract Administrator was employed, in addition to a Design and Construction Contractor, at a contracted cost, including price variations, of \$1.66 million, with expenditure to December 2006 totalling \$1.4 million.

4.39 The work completed at the School of Armour includes: facilities for relocatable Advanced Gunnery Training Systems and a Tank Driver Simulator, both of which were completed before the simulators arrived in August 2006; exhaust extraction facilities; a communications training classroom; temporary armoury racking; and a temporary engine run-up shed.

4.40 The work required at the Puckapunyal Training Range is aimed at providing upgrades to support the ABRAMS tanks on the live fire training range, as well as the armoured fighting vehicle driver training circuit.

Bandiana

4.41 The Albury Wodonga Military Area, known as Bandiana, consists of five separate Defence facilities located to the east of the townships of Albury (NSW) and Wodonga (Victoria). The main Defence activities at Bandiana, in relationship to the ABRAMS capability are: trade training; and logistics support. The facilities provided are for the Army Logistics Training Centre, and the Joint Logistics Unit (Victoria).

4.42 The DMO has advised the ANAO that it has not been decided whether ABRAMS or HERCULES vehicles will require access to workshops, engine or track testing facilities at Bandiana, and that if it is decided that access is required, this work will be funded from the Land 907 budget. Notwithstanding this advice, a Defence Draft Public Environmental Report notes that a facilities upgrade to the existing capability is required. The work required for the Bandiana Facility to support the new capability was classified as a minor project by Defence.

4.43 The facilities requirement in Bandiana is to provide a building that will accommodate two ABRAMS tanks, and comprises an overhead gantry crane and appropriate exhaust and hot air outlets to enable the engine of the tanks to be operated inside the building. As of early February 2007 all work had been complete and the facilities formally handed over to Defence.



Ian McPhee
Auditor-General

Canberra ACT
17 July 2007

Appendix

Appendix 1: Defence and DMO Response

Defence considers that the acquisition of the Abrams tank capability through Project Land 907 has been an outstanding success, and is pleased that this ANAO audit reinforces that judgement. The Defence Materiel Organisation has successfully managed the delivery of the Main Battle Tank capability ahead of schedule and on budget.

It is noted that the audit has not raised any matters that the ANAO considered warranted a recommendation for action. All issues that have been noted in the report have been addressed or are being addressed. Release of a Request for Tender for through-life support has been delayed until slightly later in 2007, to allow time for the Defence Materiel Organisation to engage more fully industry. With respect to the battle management systems, Defence expects to have suitable satellite support in place by mid 2007.

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