The Auditor-General Audit Report No.44 2001–02 Performance Audit

Australian Defence Force Fuel Management

Department of Defence

Australian National Audit Office

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Canberra ACT 24 April 2002

Dear Madam President Dear Mr Speaker

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

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

Yours sincerely

P. J. Barrett Auditor-General

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

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Contents

Abbreviations	7	
Summary and Recommendations		
Summary Background Overall conclusion Key Findings Defence Model for Fuel Management (Chapter 2) Procurement Management Practices (Chapter 3) Fuel Storage and Handling (Chapter 4) National Petroleum Industry Issues (Chapter 5) Recommendations	11 11 13 13 13 14 15 16	
Audit Findings and Conclusions	19	
 Introduction Background Defence restructuring Arrangements for the supply of fuel and lubricants The audit Defence Model for Fuel Management Introduction Supply level management of fuel Strategic management of fuel Integrating fuel management into other Defence goals Coordination of fuel management across Defence Conclusion Procurement Management Practices Introduction Standing offers Lubricants purchasing Price risk management Operational and infrastructure considerations Fuel Storage and Handling Introduction Fuel stockholding requirements Management of storage facilities Environmental aspects of fuel storage National Petroleum Industry Issues Introduction Government industry policies for the petroleum refining sector National petroleum reserve stocks The liquid fuel emergency regime National fuel standards regulation Conclusion 	21 21 22 23 25 29 29 30 36 42 44 49 51 51 51 52 55 56 58 66 66 69 72 81 88 88 89 91 92 94 96	

Appendices	99
Appendix 1: ADF fuel types	101
Appendix 2: Recent Reviews of the ADF Fuel Supply Chain	102
Appendix 3: Critical Infrastructure Project—Fuel Report	103
Appendix 4: National Support Agenda	105
Appendix 5: Bulk Liquid Distribution Study	107
Appendix 6: Performance Audits in Defence	108
Index	111
Series Titles	113
Better Practice Guides	117

Abbreviations

ADF	Australian Defence Force
ANAO	Australian National Audit Office
CDF	Chief of the Defence Force
CJLOG	Commander Joint Logistics
CSIG	Corporate Services and Infrastructure Group
DITR	Department of Industry, Tourism and Resources
DMO	Defence Materiel Organisation
EMP	Environmental Management Plans
HQAST	Headquarters Australian Theatre
JFLA	Joint Fuels and Lubricants Agency
JLC	Joint Logistics Command
MAB	Defence's Management Audit Branch
POL	Petrol, Oil and Lubricants
SLB	Strategic Logistics Branch

Summary and Recommendations

Summary

Background

1. Fuel is a critical component of military capability as it is an essential consumable for the mobility of the Australian Defence Force (ADF). The procurement, storage and distribution of fuel by the ADF represent a complex range of activities in a number of Defence sub-programs and are conducted at geographically dispersed locations.

2. The ADF uses eight different types of fuel, four of which are military specification fuels. Military specification fuels include additives that the ADF considers essential for the operation of its ships, aircraft and vehicles, in a range of demanding environments. Factors underlying the military specific requirements include the wide range of climates where the ADF may be required to operate, the need for longer-term fuel storage and safety requirements in combat situations. Over 750 different oils and lubricants are used by the ADF. The cost of ADF fuel (excluding excise) and lubricants purchases in 2000–2001 was \$223.2 million (Air Force \$118.2 million, Navy \$92 million and Army \$13 million).

3. The objective of the audit was to assess the efficiency and effectiveness of the ADF's management of fuel and lubricants and to identify possible areas for improvement. The audit focused on major aspects of the fuel supply chain, in particular the strategic management of fuel (eg. the coordination of fuel requirements and stockholding policy). The audit also reviewed fuel procurement practices, storage and handling issues. The audit coverage addressed the fuel supply aspects of these matters rather than transport, distribution and equipment issues.

4. Although directed principally towards operational fuels, the audit took into consideration issues associated with the ADF's requirement for oils and lubricants. As such, references to fuel management in this report should be interpreted more broadly to include the management of oils and lubricants.

Overall conclusion

5. The Defence fuel and lubricants supply chain is complex and involves a wide range of processes and control structures. The strategic management of this supply chain is fragmented and insufficiently coordinated. There is significant scope for Defence to improve its liaison and consultation with external agencies, concerning the petroleum industry environment. The audit identified

a number of activities being undertaken by Defence to improve the management of fuel and lubricants, in particular through organisational redesign and administrative reviews. The ANAO also found that Defence does not have a fuel procurement price risk management policy. As well, more needs to be done to effectively identify, analyse and manage these risks.

Key Findings

Defence Model for Fuel Management (Chapter 2)

6. Fuel and lubricants are a significant supply sector for Defence and much activity is taking place across Defence in the various areas and levels of management of this supply chain. Though efforts are being made through organisational redesign to develop a strategic framework for the ADF fuel supply chain, responsibility for planning is distributed over a number of separate and inadequately coordinated areas. The fuel supply chain has not, to date, been identified as a discrete area of supply logistics requiring a specific Defence/industry consultative structure.

7. Defence needs to determine and promulgate a whole-of-Defence approach to strategic management of fuel and lubricants. This includes basic steps such as consolidating research and planning data and making these available across the organisation. Joint Logistics Command is the best positioned organisational unit within Defence to assume the coordinating task.

8. Management processes would be strengthened if Defence's Joint Fuels and Lubricants Agency (JFLA) functions, outputs and responsibilities in higher-level roles were clarified and service-level agreements developed with its primary clients. Performance measures and joint review arrangements should also be developed to monitor performance of the major organisational units in the fuel supply chain and strategic linkages established with the petroleum refining industry.

Procurement Management Practices (Chapter 3)

9. The ADF uses more than 750 different oils and lubricants. Savings in inventory holding costs and the logistics supply chain could result from a rationalisation in the number of different types of oils and lubricants currently purchased for the Services.

10. JFLA's responsibility for the procurement of fuel and lubricants includes the effective management of the risks (or exposures) associated with these purchasing activities. Currently, however, JFLA does not have a price risk management policy; there is no identification and analysis of exposures; and little is done to manage the forward price risk associated with the delivery of fuel. Defence should develop a price risk management strategy incorporating measurable objectives and identify all material exposures. For those exposures that are considered to be unacceptable, alternative risk management techniques can be assessed to determine the most appropriate means of managing the exposure.

11. Improvements in price forecasting techniques and budgeting processes would allow JFLA to make more effective fuel purchasing decisions. There may be scope to negotiate better price outcomes under standing offers by giving suppliers more certainty as to when, and where, fuel will be delivered in a budget year.

12. Current fuel management information systems are a mixture of manual and electronic systems and do not allow for accurate and reliable performance measurement with regard to the purchasing of fuel and lubricants. Furthermore, it is difficult to identify consumption patterns to support risk management activities or to undertake accurate performance measurement. An integrated system of collecting and storing such data, addressing the needs of all three Services, would assist in delivering consistent, timely data and making fuel purchasing decisions more effective.

Fuel Storage and Handling (Chapter 4)

13. As the ADF does not have endorsed fuel contingency reserve stockholding policies in place, the ANAO was unable to assess the adequacy of fuel storage facilities for contingency reserve stocks. Defence would benefit from having fuel stockholding policies derived from preparedness guidance and reviewing the adequacy of fuel storage facilities against endorsed reserve stockholding and operational requirements.

14. Current Defence policies and guidelines for the maintenance of fuel storage facilities vary in their level of comprehensiveness. None is current. The ANAO considers that Defence should ensure that the draft tri-Service Military Bulk Fuel Storage Maintenance guideline is completed and formally issued as soon as possible.

15. Defence documentation indicates that a number of fuel storage tanks are overdue for their programmed inspection and cleaning processes. A rolling program of Defence fuel facility audits would help ensure the adequacy of facility infrastructure and operating procedures.

16. The ANAO identified a number of older ADF fuel installations that did not comply with Australian standards for spillage containment. Remedial action to address fuel installation infrastructure deficiencies would help ensure that spill containment systems and/or leak detection alarm arrangements for fuel facilities meet the minimum specified requirements.

National Petroleum Industry Issues (Chapter 5)

17. Chapter 5 discusses several important areas of government activity relating to the petroleum industry that directly impact on Defence's fuel supply chain management task. There is significant scope for Defence to improve its strategic liaison and consultation with relevant government agencies concerning the petroleum industry environment. In particular, the ANAO sees benefits for Defence if it:

- participated more actively with the related industry monitoring and analysis roles of the Department of Industry, Tourism and Resources;
- participated at a strategic level in National Oil Supplies Emergency Committee deliberations and in national fuel emergency regime arrangements; and
- identified a single point of contact within Defence so as to enhance dialogue with the Department of the Environment and Heritage concerning issues affecting the petroleum industry.

Recommendations

Set out below are the ANAO's recommendations, with report paragraph references and an indication of the Defence response. The ANAO considers that priority should be given to recommendations 1, 2, 3, 4, 6 and 8.

Recommendation No.1 Para. 2.89	The ANAO recommends that, in order to develop a more effective approach to the management of fuel and lubricants, Defence:	
	a) review, refine and clarify the functions and responsibility of its sub-agencies, Strategic Logistics Branch and Joint Fuels and Lubricants Agency. This includes responsibilities in higher-level roles, especially in forecasting Australian Defence Force needs and industry trends;	
	b) develop service-level agreements between the Joint Fuels and Lubricants Agency and its primary clients;	
	c) develop performance measures and joint review arrangements to monitor performance of the major organisational units in the fuel supply chain; and	
	d) establish strategic linkages with the petroleum refining industry.	
	Defence response	
	a) Agreed.	
	b) Agreed.	
	c) Agreed in principle.	
	d) Agreed.	
Recommendation No.2 Para. 3.19	The ANAO recommends that the Joint Fuels and Lubricants Agency review the range of oils and lubricants currently purchased, with the objective of rationalising the inventory for greater efficiency.	
	Defence response: Agreed.	

Recommendation No.3 Para. 3.30	The ANAO recommends that, in order to reduce the cost of fuel and enhance performance measurement, Defence develop a price risk management strategy incorporating measurable objectives; identify all material exposures; and address unacceptable exposures by the application of appropriate risk management techniques.	
	Defence response: Agreed.	
Recommendation No.4 Para. 3.62	The ANAO recommends that, to make more effective fuel purchasing decisions, the Joint Fuels and Lubricants Agency develop:	
	a) improved fuel price forecasting and budgeting processes; and	
	b) an integrated fuel management system.	
	Defence response	
	a) Agreed.	
	b) Agreed.	
Recommendation No.5 Para. 4.28	The ANAO recommends that, in order to determine the adequacy of fuel storage facility capacity, Defence complete the development of fuel stockholding policies that are derived from preparedness guidance. Defence should also review the adequacy of fuel storage facilities against endorsed reserve stockholding and operational requirements.	
	Defence response: Agreed.	
Recommendation No.6	The ANAO recommends that, to maximise the operational effectiveness of fuel facilities, Defence:	
Para. 4.67	a) ensure that a tri-Service military bulk fuel storage maintenance guideline is developed and issued as soon as possible; and	
	b) implement a rolling program of fuel storage facility audits to ensure the adequacy of facility infrastructure and operating procedures.	
	Defence response	
	a) Agreed.b) Agreed.	

Recommendation No.7 Para. 4.95	The ANAO recommends that, in order to minimise the environmental impact of fuel facilities, Defence:		
	a) undertake remedial action to address its fuel installation infrastructure deficiencies and ensure that spill containment systems and/or leak detection alarm arrangements for fuel facilities meet the minimum specified requirements; and		
	b) identify the location of its abandoned underground fuel storage tanks; assess their condition; and take appropriate site rectification action.		
	Defence response		
	a) Agreed.		
	b) Agreed.		
Recommendation No.8 Para. 5.41	The ANAO recommends that, to assist its strategic planning, Defence enhance its level of consultation with relevant departments and other bodies concerning the petroleum refining industry.		
	Defence response: Agreed.		



Navy Fuel Installation storage tank

Audit Findings and Conclusions

1. Introduction

This chapter provides a background to Australian Defence Force fuel and lubricants management practices and examines the impact of Defence restructuring on these arrangements. Both the strategic and operational levels of fuel management are affected by ongoing Defence restructuring and directional change. The chapter also sets out the audit objective, coverage and report structure.

Background

1.1 Fuel is a critical component of military capability as it is an essential consumable for the mobility of the Australian Defence Force (ADF). The procurement, storage and distribution of fuel by the ADF represent a complex range of activities in a number of Defence¹ sub-programs and are conducted at geographically dispersed locations.

1.2 The ADF uses eight different types of fuel, four of which are military specification fuels.² Military specification fuels include additives that the ADF considers essential for the operation of its ships, aircraft and vehicles, in a range of demanding environments. Factors underlying the military specific requirements include the wide range of climates where the ADF may be required to operate, the need for longer-term fuel storage and safety requirements in combat situations. Over 750 different oils and lubricants are used by the ADF.

1.3 The cost of ADF fuel (excluding excise rebates under the Diesel Fuel Rebate Scheme) and lubricants purchases in 2000–2001 was \$223.2 million³. Air Force is the largest user of fuel and lubricants with \$118.2 million, followed by Navy with \$92 million and Army with \$13million.

¹ 'Defence' comprises the Department of Defence and the Australian Defence Force. The latter comprises the three Services: Navy, Army and Air Force.

² Appendix 1 provides more detail on these fuels.

³ Data supplied by the Joint Fuels and Lubricants Agency.

Defence restructuring

1.4 Like many other areas of logistic support the Defence organisational framework for the management of fuel and lubricants has undergone significant portfolio restructuring in recent years following implementation of the Defence Reform Program, the Commercial Support Program and other initiatives.⁴ Fuel management issues were not a major element in these changes; however, the changes have impacted on fuel management. Some aspects of that impact remain to be resolved in the light of operational experience of the new logistics arrangements.

1.5 The Defence Materiel Organisation (DMO) was formed in July 2000 by the merging of the then Support Command Australia, the Defence Acquisition Organisation (DAO) and part of the National Support Division.⁵ All these organisations had interests in fuel management and by integrating them Defence sought effectiveness and efficiency gains in its logistics continuum.⁶ The Joint Logistics Command (JLC) was the organisational unit created to perform this task. JLC was created as part of the divisional structure of DMO in September of that year. JLC is the main organisational unit of Defence with a dedicated fuel management mandate. Prior to that time there was no centralised fuel management function in Defence.⁷

1.6 The National Support Division was disbanded at the time of the most recent restructuring (mid 2000) but its main functions continue to be performed.⁸ Parts of its functions were included in the tasks of a new Industry Division created in the DMO, parts were included as a new branch in the Military Strategy, Preparedness and Support Division (now called Policy, Guidance and Analysis Division) in the Strategy Group of Divisions under a separate Deputy Secretary.

⁴ Commencing in 1997 the Defence Reform Program involved major restructuring of the Defence organisation to achieve savings that were to be applied to operational combat capability and was the subject of ANAO Audit Report No.16 2001–2002, *Defence Reform Program—Management and Outcomes*. The program established the concept of 'service provider groups' (now referred to as 'enabling executives') separate from the policy, operations and combat-related functions. The Commercial Support Program was introduced in 1991 to make greater use of civilian infrastructure by contracting out support functions where this was operationally feasible and cost effective.

⁵ DMO is a central organisation in the present Defence portfolio-level arrangements and is a key enabling executive. Support Command Australia was responsible for fuel policy.

⁶ Not all groups with involvement in fuel and lubricants were brought together in this larger structure. Notably Defence Corporate Support and Defence Estate Organisation, with strong involvement in fuel facility management, remained outside it.

⁷ Although actual management was performed by elements within Army, Navy and Air Force, there were several cross-Service functional entities, in particular the Defence Petroleum and Allied Products Committee (DPAPC), which advised all three Services on technical standards, quality assurance issues and the like, but which had no executive responsibilities. The DPAPC functions were largely absorbed into the Joint Fuels and Lubricants Agency on the latter's establishment in Support Command Australia.

⁸ The National Support Division functions were to broaden, shape and improve national support capabilities and arrangements to better enable force generation, mobilisation and sustainment.

1.7 In February 2002, after fieldwork for this audit was completed, the Strategic Logistics Branch (SLB) was created in JLC. One of the functions of this branch will be to coordinate strategic guidance for the development of a whole of Defence approach to strategic fuel management. The creation of this function will address a number of the organisational issues raised in this report.

1.8 The changes that have been under way over recent years have affected the structure in which the operational and strategic management of fuel is handled in Defence. The creation of the SLB will have a further substantial impact. The report identifies the main areas where the proposed SLB role engages issues identified in this audit. The organisational structure addressing fuel supply chain management is discussed further in Chapter 2.

Arrangements for the supply of fuel and lubricants

1.9 The management of fuel and lubricants in Defence is distributed across a number of operating and planning units and is quite complex. At the level of supply management it has a single procurement system at its centre, which is located in the DMO. Ownership and management of the physical supply infrastructure are distributed across a number of other operating units and some are owned and operated by commercial suppliers.

1.10 Until the late 1990s the individual Services (Army, Navy and Air Force), as end-users of ADF fuel and lubricants, looked after their own needs, dealing separately with procurement aspects of the supply chain, arranging their own contracts and paying for the products used.

1.11 Each Service has markedly different requirements, relating not only to fuel specifications but also to their operating requirements and distribution arrangements. These different requirements have not changed since the centralisation of procurement and desirably they should be satisfied by the centralised system. The centralised system must manage a range of product lines and take account of a wide range of supply needs. The main product lines comprise the maritime, aviation and ground fuels groups, and a lubricants group. The lubricants needs are largely met by packaged products that relate to different end-use requirements spread across all three Services. The fuel product lines also cross Service boundaries; eg Navy utilises ground, aviation and marine fuels.

1.12 The concept of using a single battlefield fuel is currently being investigated by the US military. Reduction in the number of fuels used by combat units could result in significant benefits, in terms of simplifying the logistics supply chain. However, it could impose additional equipment conversion and operating costs. The ADF is monitoring overseas developments in this area.

1.13 Single-Service procurement arrangements were changed in 1998 as part of the implementation of the Defence Reform Program. Within their own domains the single Services continued to provide their operating units' needs, but the supply chain management to the boundary of these domains was centralised in one procurement agency. The purpose of the change was to address more efficiently and effectively those parts of the supply chain external to the 'agreed hand over point', ie where the individual Service-specific supply domains start (and over which they continue to exercise authority). The procurement agency was located in the then grouping of Defence's support functions in Support Command Australia before being transferred into DMO.

1.14 The focus of this centralised management is now in a dedicated agency, the Joint Fuels and Lubricants Agency (JFLA). As indicated, it is located within DMO as part of the Joint Logistics Command. In its management of the tri-Service part of the 'supply chain' for fuel and lubricants, JFLA shares responsibilities with another area of Defence, the Corporate Services and Infrastructure Group (CSIG). CSIG is part of the 'enabling' group of Defence organisations and manages the operations and maintenance of many (though not all) of the ADF's fuel facilities. Many fuel facility management functions had, for a long time, been performed by the corporate services area of Defence before the establishment of JFLA.⁹

1.15 These arrangements leave the single Services with a continuing significant role in the supply and distribution of fuel to their own operations. The single Services generally use their own dedicated assets to supply bulk fuel to their various platforms. It is the responsibility of the single Services to decide their forward fuel requirements. They communicate these to JFLA which procures the relevant stock and pays for it. The Services' role in this regard includes determining their own reserves and stockholding arrangements.

1.16 How effectively Defence can ensure timely delivery of fuel and lubricants into final use by the Services is determined to a significant extent by how well these central systems and the petroleum companies interact. Accordingly, an integrated and well-coordinated effort is required among the various areas and levels of management within Defence, as well as with the external suppliers to the operational supply chain.

⁹ The creation the Strategic Logistics Branch in February 2002, under JLC, should provide a level of coordination of strategic guidance for the development of a whole of Defence approach to strategic fuel management.

The audit

1.17 The objective of the audit was to assess the efficiency and effectiveness of the ADF's management of fuel and lubricants and to identify possible areas for improvement. The audit focused on major aspects of the fuel supply chain, in particular the strategic management of fuel (eg. the coordination of fuel requirements and stockholding policy). The audit also reviewed fuel procurement practices, storage and handling issues. The audit coverage addressed the fuel supply aspects of these matters rather than transport, distribution and equipment issues. Discussions were held with the Department of Defence, the Department of Industry, Tourism and Resources, the Department of Environment and Heritage¹⁰ and with the Australian Institute of Petroleum concerning relevant legislation and industry aspects.

1.18 Although directed principally towards operational fuels, the audit took into consideration issues associated with the ADF's requirement for oils and lubricants. As such, references to fuel management in this report should be interpreted more broadly to include the management of oils and lubricants.

1.19 A number of reviews have been undertaken in recent years on the form and structure of the ADF fuel supply chain and these are listed in Appendix 2. These reviews have identified a range of issues relating to the effectiveness of the ADF management of fuel but the findings of these reviews have not always been acted on. This report contains references to some of these reviews.

1.20 The audit was conducted using the following primary criteria:

- The management of the fuel and lubricants supply chain should be effectively structured and should incorporate a whole-of-Defence approach.
- An endorsed ADF fuel stockholding policy should be consistent with national strategic Defence guidance and should be used to determine the level of strategic fuel reserves held.
- Up to date policies and procedures should be in place to satisfy the ADF's day-to-day operational requirements for fuel and lubricants.
- Defence fuel storage facilities and associated infrastructure should reflect operational and contingency reserve stockholding requirements and comply with environmental regulatory requirements.
- Purchasing strategies should be employed to minimise the cost to Defence of fuel and lubricants and up to date procurement practices should be actively managed.

¹⁰ Environment Australia.

- The management of the fuel and lubricants supply chain should be aided by appropriate and realistic performance indicators.
- Adequate systems and procedures should be maintained to accurately record all aspects of the fuel and lubricants supply chain and to provide required reports to senior management.
- Defence should maintain appropriate relationships with the petroleum industry and external agencies in regard to the management of the fuel and lubricants supply chain.

1.21 Audit fieldwork was conducted substantively in the period from July to October 2001. The audit covered a wide range of activities within Defence and involved extensive discussions and review of documents. Matters were discussed with relevant areas of Defence throughout the audit and the audit findings were responded to in a positive manner.

1.22 A discussion paper consolidating the findings from the audit was provided to Defence in December 2001 and exit interviews were held in February 2002. The proposed report of the audit was put to Defence in February 2002 for comment. A consultant, Mr Christopher Conybeare AO, was engaged to provide expert advice to the audit team on strategic fuel management issues. PricewaterhouseCoopers and Nyrippen Creek Holdings Pty Ltd were engaged to provide expert advice on fuel and lubricants purchasing practices. The audit was conducted in conformance with ANAO auditing standards and cost \$337 000.

1.23 The report is organised into four further chapters, as outlined in Figure 1. Chapter 2 outlines the current Defence model for managing fuel, from the operational to the strategic level. Under this model, Chapter 3 outlines procurement practices and Chapter 4 the storage and handling of fuel. Chapter 5 examines national issues in the petroleum industry environment.

Figure 1 ADF fuel management—audit framework

1. Introduction	 Background Defence restructuring Arrangements for the supply of fuel and lubricants The audit 	
2. Defence Model for Fuel Management	 Introduction Supply level management of fuel Strategic management of fuel Integrating fuel management into other Defence goals Coordination of fuel management across Defence 	
3. Procurement Management Practices 4. Fuel Storage and Handling		
 Introduction Standing offers Lubricants purchasing Price risk management Operational & infrastructure 	re considerations	 Introduction Fuel stockholding requirements Management of storage facilities Environmental aspects of fuel storage
 5. National Petroleum Industry Issues Introduction Government industry policies for the petroleum refining sector National petroleum reserve stocks 		

•The liquid fuel emergency regime •National fuel standards regulation



Army Bulk Fuel Installation storage bladders

2. Defence Model for Fuel Management

This chapter examines the arrangements in Defence for the overall management of Australian Defence Force fuel needs. It briefly reviews the activities that are taking place across Defence, initiatives that are under way and what is being done to draw them together at a strategic level. The chapter identifies the need for better coordination and discusses some key issues and priorities.

Introduction

2.1 As outlined in the previous chapter, the management of fuel in Defence is a complex process that involves a range of organisational, command and control structures. The supply chain that delivers fuel and lubricant products to the Services has to be managed at several different levels. The operational or 'supply' level involves: procuring efficiently, storing safely, distributing in a timely way, and budgeting and paying for the stocks needed.

2.2 Another level of management is 'strategic': planning for future supplies, identifying supply risks, anticipating technological developments affecting the use of the products and identifying relevant political and economic trends impacting on the petroleum industry and/or the terms by which Defence may access it.¹¹

2.3 A further level of management responds to the need to embed the supply processes for fuel in wider defence-related policies of the government that apply to ADF fuel needs. This includes the better integration of Defence organic capabilities with industry-wide capabilities, facilitating more robust and effective industry input into the development of ADF capability and aligning Defence activities with other public policy objectives.

2.4 These levels of management are not discrete and separate. They relate closely to one another and, if efficiently managed, would draw from a bank of shared data. They need to be coordinated so that each one is most effective. Each level makes vital contributions to the complex Defence task of maintaining the operational readiness and sustainability of ADF military capability. The following three sections of this chapter examine these different levels of management of the fuel supply chain.

¹¹ This strategic level of management is to be coordinated through the newly created Strategic Logistics Branch.

Supply level management of fuel

2.5 The supply level of management is a core function in the fuel supply chain. It has a number of responsible participants. From the consumption end of the supply chain to the production of petroleum products, these participants include: the three Services (with active roles for their respective Headquarters); Headquarters Australian Theatre (HQAST); Joint Logistics Command (and its subordinate unit the Joint Fuels and Lubricants Agency); the Corporate Services and Infrastructure Group; and the commercial petroleum companies.

2.6 Defence records indicate that Navy, Army and Air Force consumed over 480 million litres of fuel in 2000–2001 (200.9 million litres, 25.9 million litres and 254.7 million litres respectively). The Services operate extensive logistical planning and asset networks that address their fuel needs and perform the supply task. With the overlay command arrangements in HQAST for theatre activity and joint operations, they manage the distribution of products within their own military domains.

The Joint Fuels and Lubricants Agency

2.7 The creation of the Joint Fuels and Lubricants Agency (JFLA) in 1998, within the Navy group of (then) Support Command Australia, followed some years of assessment within Defence of ways of achieving efficiencies and cost savings in fuel supplies to the Services, while meeting operational needs. Its establishment was recommended by a Support Command (Navy) Project Team in September 1997 and was part of the ongoing implementation of the Defence Reform Program.¹² With the establishment of DMO in mid 2000 and the formation of Joint Logistics Command (JLC) in September 2000, JFLA was included as an operating unit of JLC.

2.8 The Commander Joint Logistics (CJLOG) is the head of JLC. CJLOG advised the ANAO that the development of strategic planning, coordination and liaison capabilities in JLC to assist in the performance of the strategic logistics function is a very high priority in the organisation.¹³ At present, the delivery of the higher-level planning and coordination role for these functions is performed by CJLOG, supported by the Director General Materiel Management.

¹² A structural move away from the single-Service management arrangements was decided in principle in a Support Command Directive in 1997. Detailed arrangements for an integrated management process for fuel and lubricants were recommended by a 1997 Support Command (Navy) Review Team. Implementation of that team's recommendations resulted in the creation of JFLA, broadly with its present functions. See Support Command Directive 11/97 and Support Command (Navy) Project Team, *Transfer of Responsibility for the Management of Fuels and Lubricants*, September 1997.

¹³ The creation the Strategic Logistics Branch in February 2002, under JLC, should provide a level of coordination of strategic guidance for the development of a whole of Defence approach to strategic fuel management.

2.9 Figure 2 sets out the organisational framework of DMO and JLC at the time of audit, showing the positioning of the central fuel management agency in the materiel support organisation structure.

Figure 2



The Defence central fuel management organisational framework

Functions of the Joint Fuels and Lubricants Agency

2.10 JFLA's function is to procure fuel and lubricants for the Services' ships, aircraft and vehicles (and also for Defence 'commercial vehicles' for which DMO is responsible), as well as the provision of technical advice. It also arranges the supply of fuel to Navy, Army and Air Force fuel installations and to some other establishments such as communication installations. Increasingly, JFLA supplies fuel to a number of Commercial Support Program contractors via the garrison support arrangements.¹⁴ In addition, JFLA is responsible for the management of 'non-ADF fuel': the sale of fuel to visiting ships and aircraft from foreign governments. These customer groupings correspond to the six Defence outputs specified in budget guidance in the Defence Financial Management Plan.¹⁵

2.11 The fuel supply chain involves offshore as well as onshore provision. Accordingly, JFLA arranges offshore fuel supply to ADF ships and aircraft which may require refuelling while on overseas deployment. But if these units are operating beyond the 'agreed hand over point' to the Services, where JLC and JFLA's functions stop, Service-specific or joint Service logisticians administer and purchase the supplies.

2.12 At the time of audit fieldwork the JFLA Business Plan 2000 was in draft. It stated that JFLA was responsible for the following activities for the whole of the ADF and for other customers, such as foreign military forces visiting Australia: ¹⁶

- procurement of bulk fuel and lubricants;
- quality assurance of petrol, oil and lubricants (POL) supplies;
- management of POL waste disposal;
- provision of management information systems on fuel use;
- financial management of the ADF fuel and lubricants budget allocation;
- provision of POL engineering services; and
- provision of advice related to all technical specifications and standards applicable to POL products.

2.13 In a more recent listing of functions provided internally in 2001, JFLA's functions have been clarified to include:

• provision of logistics and operational support (ie arranging staging areas);

¹⁴ Garrison support arrangements include domestic services such as cleaning, security, pest control, ground maintenance and waste removal.

¹⁵ Joint Logistics Command, 2002/12 Defence Financial Management Plan Narrative: JFLA, p. 1.

¹⁶ Joint Fuels and Lubricants Agency Business Plan 2000 (draft), p. 2.

- requirements determination;
- contractual management;
- payment of all fuel accounts;
- management of ADF vehicle fuelcards;
- management of foreign fuel exchange agreements;
- management of POL-related policy documents;
- provision of advice on strategic and reserve stockholding policies; and
- audits of fuel facility installations and operations.¹⁷

2.14 The draft JFLA Strategic Plan for 2001–2002 does not include any more comprehensive or specific listing of responsibilities and functions than the foregoing.¹⁸ However, in other documentation concerning ADF activities in an offshore operation, JLC stated that 'it will not be the sole provider of logistic support to the ADF... it will be the *predominant* provider' and that JLC 'will have *a role to play* in the coordination of logistic support from other providers' (emphasis added). These comments reflect the consideration described above where JLC and JFLA's role only goes as far as the 'agreed hand over point' to the Service supply chains. They suggest that JFLA's role in the logistic domain of fuel supply is not the unqualified one indicated in the listings of functions above and that the role may be limited by operational realities. Moreover, the JFLA role in monitoring and providing management information about the fuel supply chain is heavily constrained by inadequate information systems (refer Chapter 3). JFLA has no central database on fuel usage or the full costs of the fuel supply chain and this handicaps its ability to carry out its responsibilities.

2.15 The ANAO considers that JFLA (in association with the Strategic Logistics Branch) should specify precisely, and document, the nature of, and any limits to, its operating role. This would enable other units to establish the limit of their responsibilities. The final section of this chapter examines the implications of this finding more fully.

Corporate Services and Infrastructure Group

2.16 With the major Defence reorganisation implemented in mid 2000, the functions of the Defence Estate Organisation, which included responsibility for fuel facilities, were merged into the Infrastructure Division of the Corporate Services and Infrastructure Group (CSIG). CSIG manages contracts for the

¹⁷ Brief for CJLOG on Supply Chain Arrangements for Fuel to the ADF, A/DJFLA, July 2001.

¹⁸ Joint Fuels and Lubricants Agency, *Strategic Plan 2001/2002* (draft), September 2001.

operation of fuel facilities (predominantly Navy and Army, as Air Force continues to operate most of its fuel facilities). CSIG functions also involve:

- facilities construction and maintenance;
- environmental and statutory compliance;
- waste disposal; and
- distribution to assigned asset or platform.

2.17 In some locations CSIG undertakes the fuel requisitioning function as well. This appears to be a legacy of ad hoc arrangements applied in the past, as such functions would normally be the responsibilities of the single Services. Related activities also performed by CSIG are physical delivery (for example, under the garrison support arrangements), stock control, quality surveillance, facility operation and depot-level maintenance. According to a management review undertaken by external consultants for Support Command Australia in September 2000, these arrangements have led to some duplication of fuel service activity on Defence fuel sites.¹⁹

2.18 CSIG's responsibilities accordingly involve a location-specific mix of single-Service responsibilities and some JFLA ones, as well as site-specific management of fuel facilities. Therefore, while having its own discrete role it comprises a complicating overlay to the main model of Defence fuel management. Given this level of complexity in its fuel-related roles, its activities and those of JFLA (and JLC) require particularly close and continuous coordination.

Headquarters Australian Theatre (HQAST)

2.19 As the operational command centre for integrated ADF theatre activity, HQAST provides logistic guidance and/ or coordination for ADF deployments and operations. HQAST works principally with the four Component Commands of Air, Naval, Land and Special Operations, and No.1 Joint Movements Group. Under the present Defence organisation concept, DMO exists to support the capacity of the ADF to conduct operations as one of the key 'enabling' groups for ADF operational capability. DMO must work in close association with HQAST, the Component Commands and the individual Service Headquarters.

2.20 Fuel and lubricants are a class of supply or 'domain' in the complex mix of factors involved in the logistics of combat operations. In this context, fuel and lubricants are but one part of the spectrum of input goods and services

¹⁹ Support Command Australia (Navy), Future Directions for the Fuel & Lubricant Supply Chains, by S.I.P. Pty Ltd Management Consultants, September 2000, Recommendation No. 8, p. 19.

(albeit a very important part) required to enable the ADF to deliver its capabilities in various combat situations. They sit alongside such supplies as explosives ordnance, food rations, water and pharmaceuticals.

2.21 As a component of logistics planning in the deployment of armed forces, planning for the supply of fuel must take into account highly varying, often unique, situational factors. Under Commander Australian Theatre, HQAST synthesises the planning and activities of the Component Commands. It provides an integrated focus of consideration of the logistic needs of combat units in the particular situations in which the CDF orders operations and campaigns to be conducted.²⁰

2.22 The Chiefs of Staff Committee in September 2000 considered logistics aspects of ADF operations and concluded that at the theatre level three distinct roles are required;

- a) a logistics commander to manage the supply chain to an agreed point;
- b) Commander Australian Theatre to direct priorities; and
- c) a Joint Task Force Logistics Component Commander in the Joint Force Area of Operations to receive and distribute materiel.

2.23 Joint Logistics Command, with JFLA as the subordinate operational unit, provides the logistics commander who manages the supply chain to the 'agreed hand over point' to the Services. The other personnel involved in operations are HQAST officers, single-Service personnel seconded for joint operations, or single-Service officers directed by their own commands. The Chiefs of Staff Committee conclusions indicate the close degree of collaboration envisaged and required between logisticians involved in the different commands and units.

2.24 The HQAST responsibility in fuel management requires designated personnel to have considerable knowledge of the fuel supply chain in conjunction with JFLA, especially its strengths and weaknesses in the particular area of operations. The knowledge required includes technical factors, infrastructure and commercial aspects. As for other logistical domains, this function requires personnel to have their own capabilities and expertise, which are linked to campaign planning and control at both the joint Service and single-Service levels. The actual delivery of fuel supplies to the 'agreed hand over points' to the Services, as defined in the specific theatre of operations, and the strategic planning associated with this delivery, is the responsibility of CJLOG.

²⁰ Logistics arrangements are defined in military terms quite broadly but may be understood in some sections of Defence in narrower terms. One broad definition includes in logistic arrangements 'structures, functions, responsibilities, doctrine, definitions, concepts, plans, capacity, capability and mechanisms'. Memorandum Deputy Secretary Strategy, 'Review of Logistics Arrangements at the Strategic and Operational Levels', May 2001.

2.25 These arrangements impose significant coordination tasks on CJLOG and HQAST. The ANAO observed that efforts to perform them properly are extensive.²¹ The arrangements could be improved by the precise definition of the roles and responsibilities of JLC and JFLA, full documentation of these responsibilities and the establishment of performance measures and indicators.

Commercial petroleum companies

2.26 The origin of the supply chain is the commercial petroleum refining industry. The petroleum companies supply product into the bulk fuel installations. They may continue to perform the actual supply role far down the supply chain. In some cases this includes 'purchase for use' replenishment (as distinct from 'purchase for stock' replenishment) eg fuelcard arrangements for ground transport in all three Services where Defence vehicles might use the commercial vendor network for at least part of their supply needs. The commercial vendor network is also used extensively in refuelling ships.

2.27 JFLA conducts an ongoing relationship with the supplying petroleum companies. This relationship is at the marketing and supply levels of the petroleum companies and involves JFLA applying administrative knowledge in facilitating the purchase of fuel and lubricants. JFLA technical staff also have a cooperative relationship with suppliers' technical representatives. No other wider sets of linkages or evaluation processes with the petroleum companies are in place, other than at the level of standing offer review opportunities. The petroleum companies do not have a systemic entry point into supply chain management, through which to input their own views or to receive information about prospective developments in ADF needs.

2.28 The final section of this chapter makes a recommendation on this matter. Chapter 5 of the report reviews wider strategic relationships between Defence and the petroleum refining industry.

Strategic management of fuel

2.29 The ANAO reviewed strategic initiatives under way in Defence related to the management of the fuel supply chain. The audit identified five main areas where initiatives were under way. The principal area of activity was in JLC and JFLA. Other relevant work had been or was being done in Industry Division in DMO; in Policy Guidance and Analysis Division; within Navy Headquarters in conjunction with the Defence Science and Technology Organisation (DSTO) and in Strategic Command Division. The audit found that coordination among these various initiatives was uneven and, in some cases non-existent.

²¹ The creation the Strategic Logistics Branch should facilitate these efforts.
JLC and JFLA

2.30 In May 2001 CJLOG initiated a review of supply chain arrangements for various commodities for which JLC is responsible, including fuel and lubricants. The review under way focuses on problems of 'fragmentation' and other deficiencies in the supply chain, created by: the supply chain not being managed by one authority from its beginning to its end; responsibilities of key players not being clearly defined; IT support deficiencies; costs not being clearly identified; maintenance funding being based on regional, not Defence-wide, priorities; and engineering and policy matters being under-resourced. The ANAO was advised by JLC personnel that the review was to address key issues of: difficulties in determination of requirements; resource levels for policy and liaison work in JFLA and JLC; conversion of management information to IT-generated data; and quality control over the entire supply chain.

2.31 Options being examined to respond to these deficiencies include significant re-engineering of the fuel requisitioning and purchasing arrangements through the introduction of an e-commerce based integrated system and market testing the complete fuel chain from requirement determination to the 'agreed hand over points' with the Services.

2.32 Fragmentation and other fuel chain management deficiencies had been noted in an earlier external study of JFLA commissioned by Support Command Australia—Navy as part of its Vision 2001 series.²² JFLA was then a unit within Support Command. This study had significant input from two of the petroleum companies: Shell and BP. Recommendations included: measures for 'defragmentation' of the supply chain (with central coordination by type—Sea, Land, Air); effective elimination of the separate roles in the supply chain of the Defence Estate Organisation (now CSIG); outsourcing of supply chain management to major petroleum companies; and creation of an enhanced JFLA with 'strategic responsibility for the supply chain', that would include managers with sufficient authority to liaise effectively with the wider Defence organisation and be able to 'interface with hydrocarbon suppliers'.²³

2.33 The wider issues in regard to the enhancement of JFLA's capabilities identified in the earlier Support Command Australia study do not form part of the present review. The ANAO considers that these matters should be subject

²² Support Command Australia (Navy), Future Directions for the Fuel & Lubricant Supply Chains, by S.I.P. Pty Ltd Management Consultants, September 2000.

²³ One of the recommendations of this review (no. 7, p. 19) was to establish processes, including appropriate security clearances as required, to make available adequate operational planning information to [oil company] suppliers to ensure stocks are available when and where required. Support Command Australia (Navy), *Future Directions for the Fuel & Lubricant Supply Chains*, by S.I.P. Pty Ltd Management Consultants, September 2000.

to review in the context of articulating the central strategic role of JFLA in fuel supply chain management.

Industry Division

2.34 This Division is, like JLC, located in the DMO. One of its projects initiated in 1999, the Critical Infrastructure Project, is to develop methodologies to identify the priority or 'critical' infrastructure needs of the ADF in the future and how best they might be met from national and international resources.²⁴ The project is operating within policy parameters for 'key ADF interests' determined in the Policy, Guidance and Analysis Division.

2.35 This project involves economic and industry policy issues that lie beyond Defence's portfolio responsibilities and would require significant decisions at Cabinet level. To that end the Division has the responsibility for preparing relevant submissions to government. During audit fieldwork a submission was at an advanced stage proposing a framework in which key capabilities in the Australian industry for the ADF's long term needs could be identified sector-by-sector. Development of the framework would be by CJLOG and the single Services.

2.36 The ANAO was advised that the strategic starting point of this work is that an independent and self-reliant Australian Defence Force will have ongoing needs for both defence-specific and other infrastructure located in the civil sector, some of it critical to the Defence mission.²⁵ Such infrastructure may include fuel and lubricants and the related stockholding, domestic and international supply frameworks. The project had developed Defence Industry Capability Agendas that would require the participation of key stakeholders in other government agencies as well as industry.²⁶ Fuel and lubricants, though not the subject of a Defence Industry Capability Agenda at present, were thought likely to be on the program in due course.

2.37 The ANAO considers that the ongoing development of the Defence Industry Capability Agendas could provide an opportunity for JFLA to canvass the issues involved in the petroleum refining industry's future and the ways in which the ADF can continue to access secure and reliable supplies. If the petroleum refining industry is not, in the end, identified as a 'critical infrastructure need' of Defence, this would then be on the basis of considered

²⁴ Refer to Appendix 3 for details of the Critical Infrastructure Project Fuel Report. This was a precursor study to work now being done in the Division.

²⁵ The Defence Mission: 'The Defence of Australia and its national interests'.

²⁶ Defence Industry Capability Agendas are strategic whole-of-nation mechanisms to facilitate long term Defence access to identified, critical industry capabilities within the national support base.

analysis at the strategic level, taking into account the full capabilities of those knowledgeable about fuel supply chain management. This issue does not seem to be engaging such attention at present.

Policy, Guidance and Analysis Division

2.38 The Policy, Guidance and Analysis Division is one of the three Divisions reporting to the Deputy Secretary Strategy. Its National Support Policy Branch inherited some of the residual functions for the National Support Agenda²⁷ from the former National Support Division that was disbanded in the Defence reorganisation in mid 2000.

2.39 The National Support Policy Branch function is to plan the development of 'National Support' capabilities and it facilitates coordination and mobilisation of national resources to the Defence effort. It is intended to provide policy guidance to the rest of Defence on national policy in the civil sector and on civil infrastructure. Its orientation is long term. It houses the Defence National Support Relationship Management Directorate that liaises with civil authorities and supports the conduct of the Defence dialogue with the State governments. It authored the 'Concept for National Support to Defence' policy statement, a benchmark document approved by the Defence Committee in 2000.²⁸

2.40 The Division has developed an electronic database of industry and economic facilities, part of which is relevant to fuel supply chain analysis. It has sought to maintain and develop relationships with other departments with economic and industry policy responsibilities. It conceived and developed initial planning for a possible Defence approach to government for the establishment of a broad strategic industry policy approach that would address key issues in industry support for mobilisation and sustainment, including for fuel. The initiative has been put on hold pending progress being made to clarify directions in the Critical Infrastructure Project.

2.41 The Division and its predecessor initiated, in 1999 and 2000, several studies that have significant implications for the strategic conduct of fuel management. These studies, in different ways, sought to explore prospective developments in the Australian and international petroleum industry and their implications for Defence activities.

2.42 One report in the Critical Infrastructure Project series was on fuel. The consultants employed on this project consulted with industry representatives

²⁷ Refer to Appendix 4 for details of the National Support Agenda.

²⁸ 'National Support to Defence: Optimising Combat Capability Through Access to National Resources', 2000.

in two workshops held in November 1999 and compiled a report that was produced in April 2000.²⁹

2.43 In another initiative, as part of its analysis of Defence's ability to access petroleum products in possible supply emergencies, a review was commissioned in 2000 analysing the broad legal framework in the Commonwealth and State spheres in Australia that would apply to Defence's access to the petroleum refining industry. The review found that legislation in Australia affords no statutory recognition of the ADF's needs to access supplies and that the legal regimes in the various States are diverse. It identified key threshold issues that Defence would need to address in dealing with local or national supply shortages. No similar review has been undertaken before. It is understood that Defence consideration of the issues and recommendations presented in the report is continuing.

2.44 The National Support Policy Branch (headed by DGNSP) was commissioned by the Defence Committee in April 2001 to head a study team to review logistic arrangements at the strategic and operational levels, to mount and sustain prolonged ADF offshore operations.

2.45 This project arose from a report on the 'second order impacts of the Defence Reform Program and the Commercial Support Program on ADF ability to deploy and sustain forces in the region'. The 'second order impacts' study, undertaken in March 2001, identified opportunities for improvements in strategic level organisational structure, planning, direction and doctrine in relation to the support of ADF operations of a protracted nature. The report analysis of logistics arrangements included petroleum supplies and recommended that CJLOG take the lead in implementing the improvements, in consultation with other executives and the Service Chiefs.³⁰

Navy Headquarters

2.46 The Navy's current strategic work on its forward fuel needs has arisen out of a decision by the Directorate of Navy Preparedness and Plans (DNPP) to examine fuel and stockholding requirements for the Navy in the light of experience of the deployments in East Timor and concerns about RAN stockholding levels falling below prescribed minima. These matters are pursued in Chapter 4 of this report.

²⁹ Refer to Appendix 3 for a summary of the KPMG/National Support Staff, Critical Infrastructure Project Phase 2, Fuel Report, KPMG, April 2000.

³⁰ Memorandum AG Houston HSC 'Report to the Defence Committee on Second Order Impacts of DRP/CSP on ADF Ability to Deploy Forces in the Near Region', 6 March 2001, p. 7 paragraph 23.

2.47 Separately, the Navy commissioned a study in November 2000 on 'Global Oil Production and the RAN'. This project was conducted as part of the Navy 2030 Initiative, and was a joint product of the Directorate of Naval Strategy and the RAN Sea Power Centre (formerly the Maritime Studies Program). The Navy 2030 Initiative is an umbrella activity that informs the RAN of the strategic, military, economic, technological and personnel developments that will shape the Navy out to 2030.³¹

2.48 The ANAO notes that this Navy study on the international petroleum environment, although having a wider scope than the Critical Infrastructure Project fuel study, arrived at conclusions that were consistent with those of the fuel study. The Navy study made no reference to the Critical Infrastructure Project fuel study either in its text or its list of references. There is no evidence that its commissioning arose out of any wider consideration of Defence's fuel needs at the strategic level. It has a strong Navy client orientation even though its findings are relevant to the Defence organisation as a whole. In the case of one of its recommendations, this is recognised by the suggestion that JFLA should have a wider coordination responsibility.

2.49 Actions being taken in consequence of the findings of this Navy study are confined to Navy. Defence has not established mechanisms to act on the findings of such studies, where the findings are relevant to ADF-wide strategic requirements.

Strategic Command Division

2.50 Strategic Command Division contains a broad range of logistic experience within the Joint Operations and Plans Branch. The Division's role is to support the CDF in the command and control of the ADF by providing military strategic options and advice to government, and planning and directing joint and combined military operations. These personnel also support the operational level commanders by seeking clarification on issues and providing strategic level coordination to access logistic enablers required at the operational level to successfully mount and sustain a campaign or operation.

2.51 The logistics advisers in Strategic Command Division also act as 'trouble shooters', identifying possible gaps and weaknesses in command structures and systems including problems arising out of the logistic setting. Strategic Command staff originated review work on logistic arrangements at the strategic and operational levels, to mount and sustain prolonged ADF offshore operations.

³¹ Navy Headquarters/RAN Sea Power Centre, Future Fleet Study Eight, *Global Oil Production and the RAN*, April 2001.

Integrating fuel management into other Defence goals

2.52 The integration of fuel management into other Defence goals is a level of management that is furthest removed from Defence's operational concerns with the fuel supply chain. It nonetheless directly impinges upon supply chain management in fuel. It deals with the relevance of Defence's activities as a significant customer of the petroleum industry, and a major consumer of its products, to wider defence-related policies of the government. Such matters identified in the audit included:

- integrating Defence organic capabilities with industry-wide capabilities in Australia under the National Support Agenda;³²
- facilitating more robust and effective industry input into the development of ADF capability; and
- ensuring that Defence conducts its operations as a 'good corporate citizen', fully respecting and supporting civil sector national policies such as those relevant to environmental protection and sustainable development.

2.53 The ANAO found that coordination of these management functions with the important operational and strategic level activities described earlier is inadequate. Fully functional internal coordination arrangements would form a basis on which Defence could engage more effectively with outside organisations to better achieve Defence's mission. Chapter 5 of this **e**port examines key government policy and industry linkage issues that arise out of all three of these Defence-specific areas of concern.

National Support Agenda

2.54 Petroleum industry capabilities are already closely linked with Defence capability, as commercial suppliers provide all the stock utilised by the ADF. The roles of commercial suppliers in the industry, together with transport operators, are crucial in ADF operations, especially in remote areas of Australia and in neighbouring regions. The Commercial Support Program entails the use of many private industry operators to have fuel actually delivered to ADF combat units.

2.55 The National Support Policy Branch maintains a strong strategic-level monitoring capability of petroleum industry developments. This capability, even though it has an explicit long term supply orientation, would be useful to JFLA in operational fuel supply activities as well as at any higher strategic management levels. At present however the level of interaction between these areas is limited.

³² Refer to Appendix 4 for details of the National Support Agenda.

Petroleum industry input into ADF capability

2.56 The ANAO was unable to locate a central point in Defence that coordinates petroleum industry inputs into fuel management. Some petroleum industry companies have been involved in Defence studies of aspects of the industry that have resulted in recommendations for more systematic application of petroleum industry inputs to policy development.

2.57 Defence's then Capability, Programs and Resources Branch convened a 'Defence Fuel Conference' in February 1999. The conference was intended to enable Defence to brief companies on the results of a Bulk Liquid Distribution Study undertaken by the Strategic Policy and Plans Division (now the Policy Guidance and Analysis Division) in Defence Headquarters.³³ It was intended to elicit a response from industry to this study. The ANAO was unable to ascertain the specific results of this exercise from available Defence documentation.

2.58 In the context of community consultations in the Defence Review 2000, the Defence Industry Associations Forum placed a submission before the Review advocating an enhanced Defence/industry partnership. The submission stated that 'accountability would be strengthened through the introduction of stronger and clearer linkages between strategic assessments, capability analysis and identification of requirements from industry'. It argued that:

as a matter of some urgency we encourage Defence to address the issue of civilian contractors in the field. For example, the ADF has demonstrated a reluctance to contract support to civil contractors in East Timor despite potentially significant cost savings. The East Timor experience alone has highlighted significant opportunities for industry to augment (not displace) Defence's support capabilities in areas such as port and harbour services, air movements, heavy lift and petroleum management.³⁴

Defence noted that the subject of civilian contractors in the field has been the subject of considerable strategic planning work and the issues noted in the above quote have been substantially resolved.

2.59 The documentation reviewed by ANAO indicates that Defence has received some input from petroleum industry participants at a strategic level over the years but that coordination, tracking and use of this input has been deficient.

³³ Refer to Appendix 5 for details of the Bulk Liquid Distribution Study.

³⁴ Joint Submission from Industry—Defence Review 2000, 31 August 2000, pp.3,5.

Responsiveness to other areas of government policy

2.60 The Defence portfolio has many opportunities as well as obligations under public sector policies and legislation. Fuel is a key area of concern in environmental protection. Defence attaches great importance to the task of acquiring, storing and delivering fuel to ADF units in ways that achieve environmental standards. Chapter 4 of this report outlines the role played by the Corporate Services and Infrastructure Group in the environmental aspects of fuel management.

2.61 In its current Strategic Plan for 2001–2002 JFLA lists support to operators and maintainers of fuel installations among its mission objectives, as well as 'Quality Control and Assurance Assessors of the POL Product Supply Chain'.³⁵ It would seem appropriate for JFLA to include a function related to ensuring compliance with environmental standards and the environmental performance of all operating units in the fuel supply chain. Such a monitoring role could be performed as part of its fuel facilities audit function and should involve close coordination with the Corporate Services and Infrastructure Group.

2.62 The Australian Institute of Petroleum operates the Australian Marine Oil Spills Centre. This is a centre of expertise for remediation of marine oil spills and has specialist knowledge and a range of training equipment that Defence could make arrangements to access. Audit fieldwork indicated that there is limited contact between Defence and this organisation. The ANAO considers that Defence should actively engage organisations such as the Australian Institute of Petroleum and Environment Australia in regard to the environmental aspects of fuel management.

2.63 Chapter 5 discusses other aspects of environment protection policy and legislation developments which impact on fuel supply chain management and which suggest the need for Defence to be able to pursue a more systematic dialogue with the relevant Commonwealth environment protection authorities.

Coordination of fuel management across Defence

Defence-wide coordination

2.64 Taking the foregoing survey of activities in Defence into account, the ANAO considers that Defence has initiated valuable review and development research on issues involved in strategic management of fuel across Defence. Numerous activities are under way that could lead to enhanced Defence effectiveness in fuel supply chain management.

³⁵ Joint Fuels and Lubricants Agency, Strategic Plan 2001/2002 (draft), September 2001, p. 7.

2.65 The coordination of these initiatives, however, has been sporadic and piecemeal. The capacity of Defence to draw benefits from the work being done within the organisation is constrained by unclear delineation of roles and responsibilities, lack of understanding of the expertise and capabilities of major organisational units in regard to fuel and lack of Defence-wide focus on the task of identifying pathways for resolving problems. One result is that Defence does not possess adequate information on the operation of the fuel supply chain and is unable effectively to evaluate alternative structures which may be introduced, over time, to better manage that supply chain.

2.66 The ANAO is cognisant of the work-in-progress nature of internal Defence reforms that have a bearing on logistics coordination issues and that the period of the audit fieldwork coincided with the implementation of new Defence structures. The Defence model for fuel management is, in this sense, still under development and the evolving arrangements could change in the light of experience with recent overseas deployments.

2.67 Having created the new fuel and lubricants management agency within JLC, Defence has the opportunity to achieve the alignment of the 'physical logistics continuum' and the 'conceptual logistics continuum' for fuel, which the 2001 JLC Strategic Plan envisions being necessary to obtain the efficiency and effectiveness gains of the Defence reforms.³⁶ The ANAO considers that this could be achieved, without new structures being created, if Defence could systematically identify and prioritise key strategic issues that need to be addressed. Such issues include:

- clarification of JFLA's position across the Defence organisation: its functions and responsibilities in higher-level roles especially in forecasting ADF needs and industry trends;
- establishment of JFLA's outputs, how they are to be achieved, and what is required of partner agencies to make them work;
- the negotiation of service-level agreements (especially with its primary clients, the individual Services, in the form of customer service agreements but also with cooperating partners such as CSIG, perhaps in the form of memoranda of understanding). These service-level agreements would contain performance measures and targets;
- obtaining appropriate input to strategic planning from the petroleum refining industry; and
- establishing joint review arrangements to monitor performance of the major organisational units in the fuel supply chain.

³⁶ Joint Logistics Command, Strategic Plan, March 2001, p. i.

Clarification of JFLA's role within the Defence organisation

2.68 The ANAO considers that JLC (and JFLA within it) is the appropriate centre of effort in Defence for the overall coordination task of fuel policies and management. JLC and JFLA possess relevant operational data on Defence needs, patterns of usage in the ADF and on the part of other customers, and much of the relevant technical engineering expertise. In developing the JLC and JFLA fuel management roles, full account should be taken of the single-Service fuel management responsibilities.

2.69 The level of functions undertaken by JFLA will need to be developed further, in order to reflect those listed in its current documentation. JFLA needs to clarify the scope of its operational role in regard to fuel in precise terms and how it relates to other units' responsibilities. As JLC performs relevant higher-level strategic management functions, JFLA's definition of its role will need to take full account of JLC's developing role. With the creation the Strategic Logistics Branch in February 2002, an important centre of coordination has been created that should support both JLC and JFLA in this task.

2.70 One initial area for strategic planning consideration is the future of the petroleum industry in Australia and the availability of its products to Defence in foreseeable circumstances. Because of its operational knowledge of ADF needs, JFLA is in a good position to understand the issues involved with the petroleum industry as a source of secure and reliable supplies.

2.71 For JFLA to undertake higher-level functions, such as the provision of advice on strategic and reserve stockholding policies (as JFLA documents indicate are among its functions), it will need to be resourced for, and equipped with, these capabilities and this role will need to be recognised by areas outside DMO. It would also have to develop a strategic level of knowledge about the data held by other Defence organisational units that are involved in the fuel supply chain. Formalisation of its role through appropriate directives or decisions of the Defence Committee would also seem necessary in due course.

Specifying JFLA outputs in supply chain management

2.72 Precisely specifying the outputs JFLA should deliver to the fuel supply chain management process would fill an evident gap in current arrangements and define JFLA's role in relation to the roles of other agencies and units. This would need to be achieved through joint workshop sessions with other organisational units. The ANAO suggests that an early priority might be the clarification of outputs with CSIG in relation to JFLA's outputs provided to fuel facilities.

2.73 The ANAO notes that the Defence Fuels Group (DFG) in the UK Ministry of Defence has drawn up Customer Supplier Agreements, and is developing output costs, which it uses as a basis for the negotiation of performance targets with its Service customers. Many of the DFG's functions are similar to JFLA's, though at present the DFG does not own funds appropriated for aviation and ground fuel stock purchases by Service units.³⁷ In Australia, allocation of the funds to JFLA for commodity acquisition (ie. fuel and lubricants stock) helps define JFLA's service outputs.

Service-level agreements

2.74 JFLA's draft Strategic Plan for 2001–2002 includes a 'Business Strategy - Operational Excellence' statement in which the first objective is the establishment of service-level agreements for the role of JFLA with its customers, its suppliers and its stakeholders.³⁸ Given that the negotiation of service agreements with customers can be useful in identifying 'customers' and customer relationships, this is an important objective that JFLA should work energetically to implement.

2.75 If JFLA were to specify its outputs in precise terms, in joint discussion with its customers, suppliers and stakeholders, the resulting list of outputs would form the basis for discussion of service-level agreements.

2.76 Although JFLA's relationships with partners such as CSIG might not be in the form of customer service relationships, the ANAO considers that it would be useful for similar arrangements to be established with these bodies. They could be in the form of memoranda of understanding (between enabler organisations) rather than the more detailed customer service agreements (between enabler organisations and output managers).

2.77 The Strategic Logistics Branch and JFLA should develop a service-level agreement to document the roles and responsibilities for the strategic management of the fuel and lubricants supply chain. Air Force noted that it is currently developing a Customer Service Agreement with DMO that will incorporate fuel.

2.78 Key elements of service-level agreements and other documentation would be:

• specification of the service provided by individual output; its limitations; responsibilities; geographical extent; 'agreed hand over points' to the Services;

³⁷ The DFG owns the funds for marine fuel and lubricants stock purchases and internally charges units for their consumption of its stock; however it is pursuing a single central fuel stock fund for all fuel, arrangements akin to the single line allocation made to DMO for fuel and lubricants usage by the ADF.

³⁸ Joint Fuels and Lubricants Agency, *Strategic Plan 2001/2002* (draft), September 2001, p. 11.

- differentiation of services to be provided, for example, as between stock replenishment or consumption replenishment;
- responsibilities for usage data collection, monitoring and reporting;
- identification of responsibilities of the customer unit, including in relation to civilian contractors;
- specification of performance measures and targets; and
- financial arrangements.

2.79 The ANAO suggests that the development of appropriate performance measures and targets would be a particularly important component of the service-level agreements as these would provide operating linkages with performance management.

Petroleum refining industry inputs into strategic planning

2.80 As there is no central point in Defence for liaison and consultation with the petroleum industry, JFLA should establish a function for this purpose and incorporate the activities of such a function in its business planning. JFLA business planning documents show that it intends to provide some emphasis on developing relationships with 'suppliers'.³⁹ However, the ANAO noted that Defence has not yet established, among the several areas involved in Defence, a central point of contact with the petroleum industry to enable these interests to be carried forward.

2.81 Although Defence has stated that it is a member of the Australian Institute of Petroleum (AIP), senior executives of the AIP indicated to the ANAO that there has been no discussion with Defence on strategic issues relating to fuel supplies either at the company level or through the AIP. The AIP is the chief representative of the petroleum refining industry in Australia and in that role closely monitors conditions and developments in the industry. It advised the ANAO that there would be merit in regular meetings between AIP and Defence to discuss a range of strategic issues.⁴⁰

2.82 The National Support Policy Branch maintains a position of National Relationships Manager to coordinate aspects of Defence's liaison with industry participants and commercial parties involved in the National Support Agenda. It does not have any particular focus on the petroleum industry, nor does the comparable industry liaison function in the Industry Division in DMO.

³⁹ ibid.

⁴⁰ This issue is discussed further in Chapter 5 in the context of Defence's interest in developments in the national petroleum industry environment.

2.83 The ANAO considers that JFLA is the appropriate organisational unit in Defence to provide the central liaison function and to have as part of its mission the development of higher levels of input from industry into the fuel area of logistics planning.⁴¹ It would need to operate in close collaboration with the National Support Policy Branch and the Industry Division in this task. This would be an appropriate area for the negotiation of agreed memoranda of understanding between JFLA and these other Defence groups.

Joint review arrangements

2.84 In the absence of other coordinating structures in Defence for management of the fuel supply chain, JFLA should move to create the basis of a Defence-wide monitoring mechanism for performance of the central liaison function.

2.85 Equipped as it would be, under these proposals, with documented Defence-wide management relationships and responsibilities in this area of supply, JFLA would be the appropriate body to operate a secretariat function for a consultative grouping of the major organisational units in the fuel supply chain. The secretariat's purpose would be to monitor developments, review the adequacy of follow-up measures taken in response to commissioned studies and to identify organisational gaps. This consultative body could report to a higher level of the Defence executive structure such as the Defence Committee or a delegated body.

Conclusion

2.86 Though efforts are being made through organisational redesign to develop a strategic framework for the ADF fuel supply chain, responsibility for planning is fragmented and distributed over a number of separate, overlapping and inadequately coordinated areas. There is no Defence management plan or process map for the management of fuel and lubricants. The fuel supply chain has not been identified as a discrete area of supply logistics requiring a specific Defence/industry consultative structure.

2.87 Defence needs to determine and promulgate a whole-of-Defence approach to strategic management of fuel and lubricants. This includes basic steps such as consolidating research and planning data and making these available across the organisation. Joint Logistics Command is the best positioned organisational unit within Defence to assume the coordinating task.

2.88 The ANAO considers that management processes would be strengthened if the Joint Fuels and Lubricants Agency functions, outputs and responsibilities

⁴¹ The Strategic Logistics Branch is likely to have a major role in facilitating this central liaison function.

in higher-level roles were clarified and service-level agreements developed with its primary clients. Performance measures and joint review arrangements should also be developed to monitor performance of the major organisational units in the fuel supply chain and strategic linkages established with the petroleum refining industry.

Recommendation No.1

2.89 The ANAO recommends that, in order to develop a more effective approach to the management of fuel and lubricants, Defence:

- a) review, refine and clarify the functions and responsibility of its sub-agencies, Strategic Logistics Branch and Joint Fuels and Lubricants Agency. This includes responsibilities in higher-level roles, especially in forecasting Australian Defence Force needs and industry trends;
- b) develop service-level agreements between the Joint Fuels and Lubricants Agency and its primary clients;
- c) develop performance measures and joint review arrangements to monitor performance of the major organisational units in the fuel supply chain; and
- d) establish strategic linkages with the petroleum refining industry.

Defence response

- **2.90** Defence provided the following response to Recommendation No.1:
 - a) Agreed.
 - b) Agreed. This is being implemented under the DMO program for Customer Service Agreements (CSA). CSA comprise an agreement for the provision of goods and/or services at a price, with associated performance criteria. DMO's CSA will include responsibility for the provision of certain assets, including consumables, such as fuel.
 - c) Agreed in principle. There is scope for some further refinement of existing Defence review processes.
 - d) Agreed.

3. Procurement Management Practices

This chapter outlines the fuel and lubricants procurement management practices undertaken by Defence. It provides details of the standing offer purchasing arrangements and outlines price risk management considerations. The chapter then addresses a series of operational and infrastructure considerations for the procurement of fuel and lubricants.

Introduction

3.1 Most of the fuel for Navy and Air Force is purchased in bulk. There are some bulk deliveries to Army, but a much larger proportion of Army fuel is made up of ad hoc purchases at commercial service stations using fuelcards.

3.2 Table 1 details cost data for ADF fuel (excluding excise rebates under the Diesel Fuel Rebate Scheme) and lubricants purchases for 2000–2001. The data includes the sale of fuel to foreign military forces. The data indicates that Air Force is the largest user of fuel followed by Navy, with Army having a relatively small usage. As the value of lubricant purchases is far smaller than that of fuel, this chapter focuses on fuel procurement.

Table 1

Cost of ADF fuel and lubricants purchases, 2000-2001, \$m

Cost	Navy	Army	Air Force	Total
Fuel Cost (excluding excise)	90.6	11.6	116.8	219.0
Lubricant Cost	1.4	1.4	1.4	4.2
Total Cost	92.0	13.0	118.2	223.2

Source: Joint Fuels and Lubricants Agency records.

3.3 Table 2 details the fuel types in use by the ADF, their relative usage (proportion of ADF fuel usage) and the major users of each type (Navy, Army, Air Force or foreign military forces). Appendix1 pr ovides more detail on the fuels used by the ADF.

Table 2ADF relative usage of the major fuel types

Fuel Type	Relative Usage	Major Users
F18 (AVGAS)	0.3%	Air Force, Army, Foreign
F34 (AVTUR + FSII) ª.		Air Force, Army, Foreign
F35 (AVTUR or Jet A1)	53.9%	Air Force, Army, Foreign
F44 (AVCAT+ FSII)		Navy, Foreign
F76 (Naval Distillate)	39.3%	Navy, Foreign
Automotive Diesel Oil	5.1%	Navy, Army, Air Force
Unleaded Petrol	1.4%	Navy, Army, Air Force
Lead Replacement Petrol		Navy, Army, Air Force

Source: Joint Fuels and Lubricants Agency records.

a. FSII is an icing inhibitor fuel additive.

3.4 The Joint Fuels and Lubricants Agency manages fuel and lubricants procurement in Defence. JFLA's primary objective is to ensure the timely supply of correctly specified fuel and lubricants to the desired location (volume risk management). In JFLA's documentation there is no specific objective stated for its fuel purchasing, ie. what JFLA should be achieving, how to measure and report on its fuel purchasing performance or how to manage the fuel price to deliver cost effective prices and forward price certainty (price risk management).

Standing offers

3.5 JFLA currently purchases most fuel by way of bulk fuel standing offers for each fuel type. These standing offers are purchasing agreements that set the details of the price, delivery, payment and quality of fuel at the commencement of the standing offer period which, with the exception of the price, generally remain unamended for the period of the standing offer. The agreements are negotiated through a tender process approximately every three years. The successful tenderers are then required to submit price variations on a monthly basis. Some fuel is purchased outside the standing offers, although this is mostly ad hoc or when required by operational considerations. Table 3 details the standing offers corresponding to the major fuel types in use by the ADF.

Table 3 Current standing offers against the major fuel types

Fuel Type	Current Standing Offers
F18 (AVGAS)	Shell, Mobil, BP
F34 (AVTUR+ FSII)	Shell, Mobil, Caltex, BP
F35 (AVTUR or Jet A1)	Shell, Mobil, Caltex, BP
F44 (AVCAT+ FSII)	Shell, BP
F76 (Naval Distillate)	Shell, Mobil
Automotive Diesel Oil	Shell, Sea Swift, Mobil, Gaseng
Unleaded Petrol	Currently being negotiated
Lead Replacement Petrol	Currently being negotiated

Source: Joint Fuels and Lubricants Agency records.

3.6 Based on annual budget estimates, a bulk purchasing order is raised by JFLA with each supplier, indicating the volume of fuel expected to be used. During the course of the year, the Services place delivery orders with suppliers, utilising the bulk purchasing order. A mid-year budget review indicates whether the bulk purchasing order will be sufficient. Should additional fuel be required for the remainder of the year, a further bulk purchasing order is raised. Bulk orders are typically made for Navy and Air Force, with Army ordering fuel more on an 'as required' basis. This is primarily driven by the nature of Army operations, requiring smaller quantities at disparate locations.

3.7 Although JFLA provides historical fuel consumption data to suppliers, the standing offers do not detail the amount of fuel to be used at any location. This is because of the ADF's uncertainty in predicting the expected annual fuel usage, due to unanticipated operational tasking. Some fuel standing offers adjust the price according to volume used.

3.8 Marine, aviation and ground fuel standing offers are negotiated independently of each other, by JFLA, following the end of each three year agreement period. Due to the large administrative effort required to negotiate the agreements by tender, the expiry dates are staggered.

3.9 For many years the Services have purchased ground fuels under agreements delivering prices on par with the retail market price. At the time of audit fieldwork no ground fuels standing offer was in force and the ANAO discussed with JFLA the potential for savings by implementing a ground fuels standing offer. The ANAO estimates that a standing offer could result in a lower cost per litre for fuel and that Defence could have saved \$630 000 in 2000–2001. JFLA recently called for tenders for a standing offer that is expected to deliver

lower prices for ground fuels. The ANAO considers that Defence should ensure that up to date standing offers are in place for all fuels used by the ADF, in order to minimise the cost of fuel.

3.10 Automotive diesel is included in the ground fuels standing offer.⁴² Although automotive diesel comprises only 4.7% of the total fuel cost, it is an ideal fuel for negotiation of better price outcomes under a standing offer, as it is the only fuel in use by all Services, in sufficient volume. The ANAO considers that JFLA should investigate the possibility of negotiating the automotive diesel agreement on a separate standing offer.

Standing offer monthly price variations

3.11 Each standing offer has a monthly price variation formula (which includes exchange rate calculations for the month) and sets the price of fuel delivered to different locations. The adjustment in prices is based upon the average price of the particular fuel type, for the previous month. This type of pricing arrangement implicitly decreases the amount of variability in the underlying price, which fluctuates daily on global markets. This is because large movements in the fuel price are effectively smoothed, decreasing the overall volatility. Smoothing occurs over a period longer than a year, which may experience a few large movements in price.

3.12 Platts' marker prices are used in the standing offers.⁴³ Platts provides daily pricing for a wide range of petroleum products across most geographic areas. As such, it is often used as an independent source of price discovery. For each fuel product, there is a corresponding Platts marker. All ADF fuel standing offer price markers relate to a Singapore Fuel Product and they are all included under three common markers as summarised in Table 4.

⁴² Defence advised that Automotive Diesel and Naval Distillate (F76) have the same technical specification AS 3570:1988, but, F76 is refined to a higher level.

⁴³ Platts is a specialist energy market reporting company that covers the international oil and petrochemical markets.

Table 4

ADF standing offer price variation markers

Fuel Type	Price Variation Marker
F18 (AVGAS)	Platts Singapore Motor Spirit
F34 (AVTUR + FSII)	Platts Singapore Jet Kero
F35 (AVTUR or Jet A1)	Platts Singapore Jet Kero
F44 (AVCAT + FSII)	Platts Singapore Jet Kero
F76 (Naval Distillate)	Platts Singapore GasOil
Automotive Diesel Oil	Platts Singapore GasOil
Unleaded Petrol	Platts Singapore GasOil
Lead Replacement Petrol	Platts Singapore GasOil

Source: Joint Fuels and Lubricants Agency records.

Standing offers conclusion

3.13 Purchasing fuel under current Defence standing offers results in:

- suppliers delivering fuel at a monthly floating price with no contractual certainty of volume;
- very little monitoring of fuel prices by JFLA apart from checking the price adjustment formula under the standing offers; and
- little consideration of forward purchasing of fuel at a fixed price.

3.14 Consultants employed by the ANAO concluded that the standing offers produce a relatively competitive price for fuel, but provide little opportunity to manage the forward certainty of fuel costs.

Lubricants purchasing

3.15 The ADF uses more than 750 different oils and lubricants, including greases, lubricating oils, cutting fluids, damping fluids and waxes. Approximately 80% of lubricants are purchased under standing offers. The Services operate a range of different distribution mechanisms and storage sites for these products. Some of the lubricants used by the ADF are unique to specific pieces of equipment. Manufacturers' specifications may require specific oils and lubricants to be used on their equipment, to satisfy the warranty.

3.16 The Defence Fuels Group (DFG) in the UK Ministry of Defence identified the proliferation of lubricants products in its lubricant inventory as a major issue. This not only increases supply chain costs but it also has a major impact on

deployment logistics. To address this issue the DFG identified and recorded the range of products and their specifications on a database (currently it has over 700 active items). Items with identical specifications were then rationalised. DFG has achieved annual savings by bringing the three Service inventories together and rationalising the stock holdings by up to 30%.

3.17 Another means of addressing this issue is to specify, to the extent practicable, that existing lubricants in the Defence inventory be used for new equipment brought into service. This should be enforced by way of a Defence instruction requiring that, wherever possible, project acquisition teams negotiate the use of existing Defence lubricants with equipment manufacturers.

3.18 In the draft JFLA 2001–2002 Strategic Plan, one of the business development initiatives is to minimise the inventory holding costs.⁴⁴ The ANAO considers that savings in inventory holding costs could result from a rationalisation in the number of different types of oils and lubricants currently purchased for the Services. Savings would result from a reduction in infrastructure requirements to store and distribute the lubricants in the logistics supply chain. The ANAO was informed that Defence had undertaken a study into the oils and lubricants inventory in the past, but it could not locate records of the study.

Recommendation No.2

3.19 The ANAO recommends that the Joint Fuels and Lubricants Agency review the range of oils and lubricants currently purchased, with the objective of rationalising the inventory for greater efficiency.

Defence response

3.20 Defence agreed to Recommendation No.2.

Price risk management

3.21 JFLA's responsibility for the procurement of fuel and lubricants includes the effective management of the risks (or exposures) associated with these purchasing activities. Better practice in financial risk management involves the establishment of a risk management policy (including measurable objectives), the identification and analysis of exposures and the management of unacceptable exposures. Currently, however, JFLA does not have a price risk management policy; there is no identification and analysis of exposures; and little is done to manage the forward price risk associated with the delivery of fuel.

⁴⁴ Joint Fuels and Lubricants Agency, *Strategic Plan 2001/2002* (draft), September 2001, p. 12.

3.22 JFLA should develop a price risk management policy that identifies specific objectives for its fuel purchasing, eg. the management of fuel price risk to deliver cost effective prices or to increase forward price certainty. A risk management process should be adopted that identifies all material exposures and analyses them to determine the possible cost savings that can be achieved from different risk management techniques. Steps should then be taken to cost-effectively manage any identified exposures that are considered to be unacceptable.⁴⁵

3.23 Currently, very little bulk spot buying occurs outside standing offers. Ad hoc purchases from suppliers do occur but these are a small proportion of the overall fuel cost. Bulk spot buying outside standing offers could provide a price benefit if there were better prices elsewhere, but at present there is very little capacity within JFLA for price discovery, with no price monitoring done apart from that associated with the standing offers. Defence noted that bulk spot buying has more potential for Navy fuel although other considerations such as storage capacity, tank maintenance and the contamination risk for fuel held for long periods, would need to be taken into account.

3.24 Defence noted that the military specifications of much of the fuel purchased and the time and administration required to ensure quality and delivery service commitments are met make it difficult to take advantage of low prices. This is not to say that cost savings could not be achieved when ad hoc purchasing is required and there is the information available to make an informed decision about such purchases.

3.25 Similarly, there will be occasions where a large future fuel usage is known and prices are at levels attractive to forward buying, but Defence will need to access risk management expertise and market information in order to undertake these activities. To pursue price sensitive buying, Defence needs to be able to monitor price fluctuations closely.

Price monitoring

3.26 The adjustment in prices under the standing offers is carefully monitored, but there is currently no monitoring of forward prices outside standing offers to determine whether prices paid throughout the year are representative of prices paid in commercial practice. This could be a difficult exercise given that the ADF uses specialised marine and aviation fuels for which it is the only customer in the

⁴⁵ The fuel price risk could be managed by a range of techniques including spot buying outside standing offers, price forecasting to lessen budget variances, adjusting the standing offers to include a greater fixed price component or by using financial market instruments to hedge. Although hedging and the use of fixed price contracts manage risk by reducing uncertainty, a reduction in forward variability can imply extra cost. Any decision by JFLA to hedge should be made only when it is able to hedge as efficiently as its suppliers. Whether JFLA can achieve this is dependent on its ability to efficiently implement hedge transactions.

domestic market. Pricing for commercial automotive fuels (in particular diesel) at numerous locations around Australia is easily obtainable at negligible cost.

3.27 Although it may be difficult to obtain pricing on military specification fuels, prices for corresponding commercial fuel products (such as marine and jet fuel) would be obtainable through an industry consultant. If a spread from a commercial to a military fuel price is applied, it is then possible to construct prices for non-commercial products.

3.28 From this, a greater understanding could be gained of the relationship between Australian fuel product prices and the reference marker prices in Singapore. This is useful from a performance measuring point of view and introduces opportunities to perform spot buying outside of standing offers and bulk forward buying.

Price risk management conclusion

3.29 The ANAO considers that Defence should develop a price risk management strategy incorporating measurable objectives and identify all material exposures. For those exposures that are considered to be unacceptable, alternative risk management techniques can be assessed to determine possible cost savings and decisions made as to the most appropriate means of managing the exposure.

Recommendation No.3

3.30 The ANAO recommends that, in order to reduce the cost of fuel and enhance performance measurement, Defence develop a price risk management strategy incorporating measurable objectives; identify all material exposures; and address unacceptable exposures by the application of appropriate risk management techniques.

Defence response

3.31 Defence agreed to Recommendation No.3.

Operational and infrastructure considerations

Purchasing expertise within JFLA

3.32 JFLA sees its primary role as facilitating the purchasing of fuel through the management of standing offers and accounts payable. As such, much of JFLA's administrative effort involves the processing of Service initiated fuel orders and payment of supplier invoices. This requires considerable knowledge of the workings and infrastructure of each of the Services.

3.33 JFLA notes that it operates with a minimum number of staff in the areas of fuel purchasing and reporting, as fuel purchasing decisions are made by each Service depending on their operational needs. The standing offers are negotiated once every three years, but the tender process typically requires a significant amount of time and effort to manage.

3.34 JFLA's knowledge of risk management techniques and the fuel market (outside of standing offers) is limited. This constrains JFLA's ability to manage fuel cost and price risk outcomes. JFLA has sufficient experience to manage the delivery of fuel to the Services in an effective manner, but it currently lacks the necessary experience to manage the price risk associated with the delivery of fuel. This becomes important as more emphasis is placed on budgeting, future price forecasting and in taking advantage of favourable market prices should they become apparent from time to time. Specifically, JFLA requires expertise in:

- general risk management techniques including knowledge of spot and forward markets as well as the instruments used to manage such risks; and
- specific fuel markets knowledge to tailor any risk management strategies to the unique requirements of the fuel market.

3.35 Developing this knowledge in-house could require substantial investment in training and recruitment. An alternative is to utilise the services of an external risk management advisor or an oil broker (though conflicts of interest could arise through possible dual roles as supplier and advisor). An external specialist risk management advisor could help JFLA to manage fuel price risk and develop skills in-house through exposure to commercial expertise and methodologies.

Fuel procurement budget process

3.36 The two primary inputs required to compile a fuel budget are the expected usage volume and the cost price per unit of volume. The annual budgeting process involves each Service estimating their expected usage volume (based upon their expected operational activities for the following year) and submitting funding bids to the Joint Logistics Command.⁴⁶ The uncertainty that exists in the expected usage of fuels typically arises due to unplanned operational activity that occurs each year.

3.37 JFLA compiles the Service estimates into a budget and develops a monthly summary of fuel cost and usage against the budget estimates. The monthly summary takes some days to complete, due to the large number of systems in

⁴⁶ The Services' operating stock forecasting processes are described in more detail in Chapter 4.

use by the Services, and the need to reconcile these with ROMAN, the Defencewide financial transactions recording system. A mid-year budget review uses updated details of operational activities and fuel prices. From this, a decision is made concerning the adequacy of the budget estimates and this process may result in a formal bid for additional funds.

3.38 There may be scope to negotiate better price outcomes under standing offers by giving more certainty as to when and where fuel will be delivered within a budget year. The feasibility of this will depend on how firm, at a detailed level, JFLA can be in preparing the budgets and their ability, if forecasts are inaccurate, to manage the logistics aspects (eg use of available storage capacity and the need to buy an agreed minimum amount of fuel). To be able to achieve better price outcomes, the Services will need to provide JFLA with more detailed information relating to the volumes of fuel intended to be consumed and the locations.

Price forecasting considerations

3.39 Different methods of price forecasting can be used in budget estimation eg. the most recent fuel price can be applied to the following year's estimated volume usage or a Consumer Price Index (CPI) price escalator can be applied to the previous year's fuel price. Two recent reports were commissioned by Defence to investigate forward fuel price forecasting and the use of CPI escalators.⁴⁷ The reports found very little relationship between forward fuel prices and the CPI.

3.40 The reports detailed other methods for price forecasting including the use of fuel forward curves and price forecasts from industry analysts. The fuel forward curves represent prices at which the market is prepared to buy and sell oil up to 10 years ahead. They can be considered as the market's forecast of future prices because they are based on the price that the market is trading at and they reflect the level at which actual contracts are being transacted.

3.41 Forecasting forward market rates is difficult, as petroleum markets tend to be affected by international supply factors relevant to the particular refined product. However, the use of petroleum market intelligence from oil brokers or information providers such as Platts would provide greater perspective on fuel prices.

3.42 Regardless of the method used to forecast fuel prices, JFLA, as the central manager of fuel purchasing and fuel price risk, should provide the expected unit cost of fuel for the budget process. Market forecasting services could be used to estimate forward fuel costs (based on recent fuel prices), for incorporation

⁴⁷ Macquarie Risk Advisory Services Limited, *Fuel price forecasts and analysis of historical CPI and fuel prices*, March 1999 and Bankers Trust Risk Management Advisory, *Report on Fuel Price Movements Analysis*, March 1999.

into the monthly budget reports. Improvement of price forecasting techniques and their integration into the budgeting process by JFLA would enhance the reliability and usefulness of forecasting activities and therefore JFLA's ability to employ strategies to better manage price risk.

Fuel management systems

3.43 The main systems that JFLA operates are a payments system (which processes the billing associated with fuel purchases) and a number of smaller manual and electronic fuel management systems (which record fuel usage and cost information). ROMAN is used to process payments to suppliers.

3.44 JFLA can access data monthly on a disaggregated basis (eg by Service, by product) but has not automated the aggregation of data (eg total usage and cost by product in a rolling year-to-date format). The result is that, although data is generally available, it is located over a number of systems and spreadsheets and it would be a laborious manual task to aggregate the information and open to error. A brief description of the fuel management systems used by each Service is provided below.

Navy

3.45 Navy currently operates a paper-based system that can be reconciled with supplier invoices. This is possible as there is only a relatively small number of bulk deliveries and the administrative burden is not great.

Army

3.46 A majority of Army's fuel purchases are transacted through a system operated by Transponder Technologies, a third party provider. The company operates a fuelcard system (FUELSCAN) that uses transponders at fuel depots to record fuel usage information. Only 80% of total usage can be tracked by FUELSCAN as a number of Army bases with fuel facilities are not linked to the FUELSCAN system.

3.47 JFLA obtains information from this system via an e-mail request. This is usually done monthly for the 25 000 vehicle fuelcards presently on issue. Fuelcards are allocated to units rather than vehicles and most of the fuel is purchased as required. The information can then be reconciled with supplier invoices to ensure payments are correct. As this is a manual reconciliation it imposes a significant administrative burden on JFLA.

3.48 At present, Army purchases approximately 43% of its fuel at commercial retail service stations. Fuelcards used at Defence facilities deliver prices under standing offers. Purchases made at commercial retail service stations are at the

prevailing retail rate at that station. The ANAO suggests that JFLA should seek to negotiate a discount with the petroleum companies for fuel purchased under the fuelcard system at retail sites. JFLA has noted that recent tender activity will ensure that the majority of commercial retail service stations will be subject to a standing offer price in the future.

3.49 All other fuel and lubricants purchased by the Army are paid through the receipt of an invoice from the supplier, on orders raised by JFLA (based on requests for delivery from the Army). JFLA is unable to reconcile these payment receipts to supplier invoices accurately and efficiently, as much of the information is transferred on paper manually.

Air Force

3.50 Data on fuel purchases from Air Force bases are provided monthly to JFLA via a spreadsheet. Purchases made at commercial airports are reconciled via e-mails with the commercial airports and the suppliers. Supplier fuelcards also provide significant information (by aircraft tail number) related to fuel purchases at commercial airfields.

Integration of fuel management systems

3.51 At present, fuel management activities use a mixture of manual and electronic processes. There is no integration between the fuel management systems and ROMAN. Much of the administration work undertaken by JFLA is to reconcile the supplier invoices for payments, with fuel receipt information generated by the wide variety of systems currently in use.

3.52 JFLA acknowledges the need to better integrate its fuel management systems and has taken steps to address this important objective by engaging commercial operators with well developed fuel management systems to help develop a solution. The benefits sought from such a system relate to the capture of operational efficiencies including:

- reduced administration in reconciliation of usage and payments;
- better reporting and forecasting ability due to one single database; and
- increased ability to utilise storage facilities and greater understanding of fuel usage patterns.

UK experience

3.53 The UK Defence Fuels Group is seeking a new information system for managing bulk fuels at headquarters and base level that gives it global stock visibility. It wishes to be able to understand the full cost of supplying fuel to the front line along the physical supply chain as well as the utilisation of supply

chain assets. The 'Bulk Fuel Inventory Solution' that it is developing will manage all the bulk fuel stocks using a single, tri-Service business process. DFG is willing to modify its business process to enable the rapid introduction of an economical commercial off-the-shelf solution. DFG intends the solution should cost less than 0.4% of the value of the fuel supply business and should be provided as a managed service by a contractor.

Other payment considerations

Supplier payment discounts

3.54 Due to system constraints, performance measurement of supplier discounts is difficult. JFLA has noted that until October 2001 its systems allowed for the payment of fuel purchases within seven days of receiving the invoice, thereby receiving supplier discounts. This was focused on bulk delivery of fuel to Navy and Air Force, as the Army has few deliveries of bulk fuel.

3.55 In October 2001, the Director of Treasury and Banking within the Department of Defence directed that only those early payment discounts that were more cost effective than the current overdraft rate for the Department should be taken. At present no early payment discount is taken up by JFLA as it notes that the current overdraft rate is 5.95% per annum and no discount offer by any supplier is more cost effective than this rate. JFLA currently uses a spreadsheet (based on policy provided by the Defence Treasury and Banking Directorate) to determine whether to take up early payment discounts.

Diesel Fuel Rebate Scheme

3.56 The Diesel Fuel Rebate Scheme provides a rebate when certain diesel fuels (primarily marine fuels) are used in particular circumstances. As the excise component of the fuel price can be significant, JFLA currently receives a rebate in the order of \$60 million per annum for marine fuel usage. Discussions between JFLA and the Australian Taxation Office have indicated that Defence could claim some automotive diesel fuel rebates. This is being investigated further, but current information systems do not facilitate the identification of the level of automotive diesel fuel rebate that should be sought.

Selling of fuel

3.57 JFLA sells Navy and Air Force fuel to parties external to the ADF. This typically takes the form of sales to foreign defence forces requiring fuel and to domestic operators (eg. garrison support contractors). Sales to local commercial operators usually occur when the fuel specification falls below ADF standards or if commercial operators require fuel in an emergency. Fuel is sold at a pass-

through cost with an administrative margin from 5% to 20% (depending on the status of the customer eg. commercial or other Government). This arrangement allows for the recoupment of administrative costs and ensures that there is no additional cost to JFLA.

3.58 Defence currently has three Fuel Exchange Agreements in place (with the US Navy, Royal Navy and Royal NZ Navy) to facilitate the sale of fuel to overseas military forces. JFLA has noted that fuel is mostly provided to US forces and that, on average, 15% of the fuel purchased by Navy is used by overseas military forces each year. The Fuel Exchange Agreements allow for the netting off of fuel usage between nations and payment only for the cost of fuel outstanding. Air Force sales to foreign defence forces are on a direct invoice basis and account for up to 8% of total Air Force fuel purchases.

3.59 At the time of audit fieldwork foreign military forces were \$15.6 million in arrears with fuel payments, for fuel supplied by the ADF. Invoices are sent (and are followed up on a regular basis), but JFLA noted there is little it can do to enforce the payment of monies owed. The ANAO suggests that Defence should negotiate a late payment penalty clause in its Fuel Exchange Agreements with overseas military forces. JFLA is pursuing this with the current US Navy Fuel Exchange Agreement.

Operational and infrastructure conclusions

3.60 To make more effective fuel purchasing decisions, JFLA needs to further develop its fuel price forecasting techniques and improve its budgeting systems and procedures. There may be scope to negotiate better price outcomes under standing offers by giving suppliers more certainty as to when, and where, fuel will be delivered in a budget year. Opportunities to isolate base level usage should be investigated with the Services and considered in future price negotiations with suppliers.

3.61 Current fuel management information systems are a mixture of manual and electronic systems and do not allow for accurate and reliable performance measurement with regard to the purchasing of fuel and lubricants. Furthermore, it is difficult to identify consumption patterns to support risk management activities or to undertake accurate performance measurement. An integrated system of collecting and storing such data, addressing the needs of all three Services, would assist in delivering consistent, timely data and making fuel purchasing decisions more effective.

Recommendation No.4

3.62 The ANAO recommends that, to make more effective fuel purchasing decisions, the Joint Fuels and Lubricants Agency develop:

- a) improved fuel price forecasting and budgeting processes; and
- b) an integrated fuel management system.

Defence response

- **3.63** Defence provided the following response to Recommendation No.4:
 - a) Agreed.
 - b) Agreed.

4. Fuel Storage and Handling

This chapter discusses the fuel storage and handling requirements of the ADF and looks at the mechanisms the ADF uses to calculate its operating and contingency stockholding requirements. It also considers the management of storage facilities and environmental aspects of fuel storage.

Introduction

ADF fuel storage facilities

4.1 In each Australian State and Territory a statutory body administers legislation on the storage and handling of flammable and combustible liquids. Australian standards, in particular AS1940,⁴⁸ along with Australian Institute of Petroleum codes of practice, supplement the legislative requirements.

4.2 ADF fuel storage facilities are generally constructed on Commonwealth land and are operated by both Service personnel and contractors. As detailed in Chapter 2, the Corporate Services and Infrastructure Group manages contracts for the operation and maintenance of most ADF fuel facilities, as well as ensuring that environmental requirements for the storage facilities are met. The flammable nature and environmental risk posed by fuel and lubricants storage place responsibility on CSIG and the Services to ensure that tanks and auxiliary equipment are suitably maintained and proper fuel handling procedures are followed.

4.3 The ANAO conducted a qualitative survey of ADF fuel installations and distributed it to CSIG Regional Managers (as CSIG manages contracts for the operation of fuel facilities) and Service fuel facility operators. The survey covered facility issues in the areas of maintenance, environment, staff training and safety, where information could not be centrally supplied by Defence. The findings of this survey are referred to in this chapter.

Navy fuel storage facilities

4.4 Navy stores bulk fuel at six port locations around Australia, with the largest of these being Fleet Base East (Sydney), Fleet Base West (Perth) and Darwin Naval Base. Constructed between the 1920s and the 1980s, Navy's fuel storage

⁴⁸ Australian Standard AS1940, *The Storage and Handling of Flammable and Combustible Liquids*, 1993. This standard sets out requirements for the design, construction and operation of installations for the storage and handling of flammable and combustible liquids in locations that are generally industrial, commercial or rural in nature. It includes matters relating to facility operations and the management of emergencies.

facilities are the oldest and largest in the ADF. Tanks at Navy facilities range in size from 500 000 to 13 million lites. The facilities comprise predominantly above-ground tanks with associated pump and pipeline distribution infrastructure terminating at a loading wharf.

4.5 Navy fuel installations primarily store marine diesel (F76) along with aviation fuel (F44). F76 is stored at all locations and F44 storage is determined by the operating demands of the fleet. Navy's storage facilities were originally operated by uniformed personnel but contractors now operate the facilities, with a uniformed supervisory presence at most sites.

Army fuel storage facilities

4.6 The Army operates a decentralised network of minor fuel facilities throughout Australia. These are, in effect, large 'service stations' that store commercially available fuels (primarily automotive diesel and petrol). Tanks at Army facilities range in size from 2000 to 227 000 lites and comprise both under and above-ground facilities, with associated pump and pipeline networks. Army's fuel storage capability is designed for distributing small quantities of ground and aviation fuels to a dispersed inventory of fighting assets in support of training, logistics and operational needs.

4.7 Data on the location and total number of Army fuel storage facilities (including abandoned storage facilities on Defence property) are not readily available. However, Defence documentation noted that storage tanks vary greatly in their age and condition. Army's ground fuel facilities are operated and maintained by contractors with a small permanent military presence.

Air Force fuel storage facilities

4.8 Air Force stores fuels at 18 bases around Australia in a combination of under and above-ground covered storage tanks. Tanks at Air Force facilities range in size from 80000 to 7.9 million litres. Underground pipes are used to connect fuel tanks and to enable distribution to tarmac refuelling areas. In addition to aviation fuels, Air Force also stores ground fuels for the operation of base equipment such as fuel tanker trucks ('pie carts' to transport fuel from the storage facility to refuelling areas), for emergency generator use, ground support equipment and commercial vehicles.

4.9 Air Force storage facilities range in age from a number of modern fuel installations equipped with state-of-the-art electronic monitoring equipment to sites that are decades old. Fuel facilities are operated by both contractors and uniformed personnel.

Transport and distribution

4.10 As mentioned above, Australian Standard AS1940 sets out requirements for the handling of flammable and combustible liquids. Defence seeks to comply with these requirements, even though the standard exempts Defence from certain transportation and distribution requirements (eg. Defence does not have to comply with the standard for 'temporary field storage and associated facilities in remote locations').⁴⁹

4.11 Navy stores and distributes fuel in bulk amounts, the size of which depends on the fuel capacity of its vessels and length of time to be spent at sea. Fuel is transported from fuel installations to vessels either by road tanker, pipelines at the wharf or by 'Self-Propelled Water and Fuel Lighters'. These lighters are used when the vessel cannot come into the port or when a ship is unable to refuel at the dockside. At some ports there is a large network of piping used for fuel transfer although there is an increasing component of the pipelines that is not fully utilised due to its physical state of repair. Navy has two bulk fuel tankers HMAS SUCCESS and HMAS WESTRALIA, both capable of refueling Navy vessels with F76 and F44.

4.12 Army has a fuel transportation network consisting of 'B-double' bulk fuel tankers and 'Truck Tanker Fuels'. All are capable of travelling to remote locations in support of activities. Army also has the capability to construct fuel facilities (known as Bulk Fuel Installations) in the field environment. Collapsible fuel bladders, bunding⁵⁰ and spillage preventative sheeting are used when deployed in the field environment.

4.13 The vehicle fleet supported by the Army fuel supply chain consists of 618 commercial ('white fleet') vehicles, 4695 specifically designed vehicles for off road activities ('green fleet'), and 3909 other pieces of equipment requiring fuel, such as generators, plant equipment and forklifts. Army vehicles can refuel directly from storage facilities, a civilian petroleum operator (when military supplied fuel is unavailable) or from units in the field environment.

4.14 Air Force uses pipelines, tankers and medium sized 'piecart' trucks (used in conjunction with underground pipeline hydrants) to distribute fuel to its aircraft. Tankers are used in the uptake of fuel from storage facilities to the refuelling area when pipeline hydrants are unavailable.

4.15 The transportation of bulk fuels is an area that is currently receiving much attention by the ADF in the form of Joint Project 2059 (JP2059), the Bulk Liquid Distribution Study. Part of the project's aim is to review the Services' fuel

⁴⁹ Australian Standard AS1940, *The Storage and Handling of Flammable and Combustible Liquids*, 1993, para 1.6.

⁵⁰ A bund is an impervious embankment or wall around a fuel facility designed to contain spills.

distribution assets and enhance the ADF's capability to transfer bulk quantities of aviation and ground fuels. Appendix 5 details the proposed phases of this project. As the Services' fuel distribution assets were not central to the focus of this performance audit, this aspect of the fuel supply chain was not covered in depth.

Fuel stockholding requirements

Operating stock requirements

4.16 A number of different planning techniques are used by the Services to forecast their fuel operating stock requirements each year. For Navy, Maritime Headquarters projects its annual Fleet Fuel Allowance for marine diesel by reference to the Fleet Activity Schedule (FAS). The FAS is derived from known operational commitments and training requirements necessary to 'work-up' its fleet units to an operational state of readiness. An allowance is also made for known demand from visiting foreign warships. The forecast of aviation fuel requirements is based on the aircraft 'rate of effort' published in Plan Green. The projection for ground fuel is based on the previous year's requirements, modified by known significant variations.

4.17 Land, Training and Joint Logistics Command units bid through their individual planning and estimates programs for Army's ground and aviation fuel funding. These bids are developed in accordance with planned training exercises and activities. Army Headquarters consolidates the bids and develops the final allocation of fuel to units and this is subsequently endorsed by the Chief of Army Senior Advisory Group. The estimate for lubricants is based on the previous year's requirements.

4.18 Air Force aviation fuel requirements are derived by Air Force Headquarters each year from the flying hours and rates of effort required from each of the Force Element Groups. The Air Force makes allowance for Navy and Army usage of aviation fuel at its bases. The estimates for ground fuel are based on the previous year's requirements, modified by known significant variations. Air Force monitors the holdings of AVTUR and AVGAS at its fuel facilities, updated weekly.

4.19 The ANAO sought to analyse fuel stock turnover data in order to assess the adequacy of storage capacity at ADF fuel installations for its ongoing operational requirements. As Defence was unable to provide this data readily, the ANAO referenced an analysis conducted in 1996 by Defence's Management Audit Branch.⁵¹ This report noted that Navy's F76 stockturn ratio was low for

⁵¹ Department of Defence, Management Audit Branch, *Fuel Management in Defence*, No 96004 ACT, September 1996, p. 57.

the four Naval Fuel Installations at Sydney, Perth, Darwin and Cairns;⁵² that, of the Army's numerous facilities, only the Bandiana and Guildford capacities were inadequate; and that Air Force's Darwin stockturn ratio indicated insufficient fuel storage capacity.

4.20 Since then the ADF's operational tempo in northern Australia has continued to increase and Air Force has increased its storage capacity in Darwin. This audit highlighted some concerns within Navy as to the capacity of its northern aviation fuel storage facilities. The ANAO considers that Defence should analyse fuel stock turnover data for its major fuel installations, in order to assess the adequacy of fuel storage capacity for ADF operational requirements.

Reserve stock requirements

4.21 ADF reserve stockholding policy⁵³ provides guidance for the determination and management of ADF reserve stocks (those stocks held in peacetime to support possible future contingency operations), including fuel. The policy sets out the basis for determining reserve stock requirements and seeks to quantify and cost the stockholding implications of preparedness objectives.

4.22 The policy notes that reserve stocks are required to cover the increment of contingency demand over and above normal peacetime requirements. It takes into account supply factors such as contingency provisioning lead time (the time from the start of readiness notice until supply of materiel at the full contingency demand rate can be maintained) and demand factors (such as operational activity levels and platform usage rates), in determining reserve stock requirements to satisfy preparedness objectives.

4.23 Despite the policy guidance, the ANAO established that the Services had not derived endorsed fuel contingency reserve stockholding policies from preparedness objectives. The principal reasons for this are insufficient detail in the guidance that is available and an immaturity in the degree of development of the sustainability aspects of the preparedness management framework.⁵⁴ Current preparedness reporting systems provide limited visibility of fuel consumption and costs against operational activities and this constrains the Services' ability to determine fuel usage against preparedness objectives and therefore the storage capacity required.

⁵² A low stockturn ratio indicates that the storage capacity is more than adequate.

⁵³ Defence Instruction DI(G) LOG 06-4 outlines ADF reserve stockholding policy guidance. ADF preparedness doctrine is promulgated in 'ADFP 4 - Mobilisation Planning' and preparedness objectives are stated in the Services' preparedness directives.

⁵⁴ Decision Making for Preparedness, P Preston, D Wood, D Cox, October 2000, p. 33.

4.24 In the past the Services have developed their own planning assumptions and operational scenarios, upon which fuel consumption estimates and stockholding levels have been generated. Although these assumptions are based on the military judgement of individuals, they have not been endorsed at the Defence Committee level. Funding limitations and competing priorities may preclude full resourcing of identified fuel stockholding requirements. Consequently, support for supplementation for any unresourced stockholding requirements.⁵⁵

4.25 In recent years the Navy has undertaken several studies into its fuel stockholding requirements, covering issues such as projected world crude oil production and expected future consumption of fuel oil by its fleet. A report in November 2000 examined contingency stock arrangements for F76 diesel fuel.⁵⁶ In an April 2001 study the Navy analysed the fleet's current and projected oil allowance and consumption and recommended that fuel stocks be increased.⁵⁷ Navy Headquarters' documentation indicated, however, that the results of these studies have been inconclusive and that the methodology to determine appropriate fuel stockholding levels needs to be developed further. Issues in Navy's reserve stockholding capacity for fuel needs are continuing to be examined in work currently under way. As part of this work Navy Headquarters is developing a new fuel stockholding policy based upon methodology and modelling undertaken by the Defence Science and Technology Organisation.

4.26 Army and Air Force have not undertaken any recent studies into their fuel stockholding requirements and neither Service has a current fuel stockholding policy in force. The Air Force has made its Force Element Group commanders responsible for determining the level of fuel they require in storage. Army relies on an out-of-date Defence Instruction (DI(A)SUP 63-1, issued in 1979) and local commanders determine the fuel stockholding levels for their areas.⁵⁸

4.27 As the ADF does not have endorsed fuel contingency reserve stockholding policies in place, the ANAO was unable to assess the adequacy of fuel storage facilities for contingency reserve stocks. The ANAO suggests that Defence should proceed with the development of fuel stockholding policies that are derived from preparedness guidance, seek endorsement of the policies by senior Defence management and review the adequacy of fuel storage facilities against endorsed

⁵⁵ Preparedness Task Force, December 2000, p. 26.

⁵⁶ Directorate of Navy Capability, Study into the Requirements for Contingency Stocks of F76 Dieso, November 2000. Also referred to in Chapter 2.

⁵⁷ Global Oil Production and the RAN, April 2001, A Gaczol, A Dallwitz, C Thomson, p. 14–18.

⁵⁸ Support Command Australia (Navy), Future Directions for the Fuel & Lubricant Supply Chains, by S.I.P. Pty Ltd Management Consultants, September 2000, p. 13.

reserve stockholding and operational requirements. This review should involve consultation with CSIG to address any identified facility requirements.

Recommendation No.5

4.28 The ANAO recommends that, in order to determine the adequacy of fuel storage facility capacity, Defence complete the development of fuel stockholding policies that are derived from preparedness guidance. Defence should also review the adequacy of fuel storage facilities against endorsed reserve stockholding and operational requirements.

Defence response

4.29 Defence agreed to Recommendation No.5.

Management of storage facilities

Service maintenance policies

4.30 The Services currently have separate instructions for the maintenance requirements for fuel facility plant and equipment. These instructions have a range of issue dates from 1977 to 1994. The JFLA draft Business Plan 2000 contains a business initiative to 'develop single and tri-service policy for fuel and lubricant issues'. The Estate Technical Services Section of CSIG and JFLA have collaborated to develop a draft of the Military Bulk Fuel Storage Maintenance guideline as part of the Defence Estate Management Guide.⁵⁹ The guideline is intended to outline maintenance requirements for fuel installations and will be released once areas of responsibility have been determined between CSIG and JFLA. It will be used to develop a tailored maintenance routine for installations. Installation staff will be able to incorporate local issues such as climate, requirements and maintenance schedules recommended by equipment manufacturers.

Navy maintenance policy

4.31 Navy's current policy 'Marine Fuels and Lubricants Handbook' ABR 6107 was published in May 1994. It is concerned with the management of marine and aviation fuel, ashore and afloat. ABR6107 is acknowledged by Navy to be out of date. It lists the Director General Naval Logistics Policy as being responsible for the establishment of logistics policy for bulk fuel, lubricants and the procurement and management of allied products. JFLA is now tasked with these functions and the policy therefore requires updating to reflect the change of responsibilities.

⁵⁹ Defence Estate Management Guide, Book 4 Part 5 Chapter 12, Military Bulk Fuel Storage Maintenance.
4.32 The policy is to be replaced by a new Navy Instruction, with work envisaged to commence in the next 12 months by JFLA and CSIG. The new instruction will be developed from the tri-Service Military Bulk Fuel Storage Maintenance guideline. Until a new policy is issued, matters that are not appropriately covered by ABR 6107 will be resolved by amendments issued from JFLA.

Army maintenance policy

4.33 The Army Manual of Equipment Management and Accounting provides broad guidance on receipting, accounting for stores and equipment and includes a chapter on petrol, oil and lubricants (POL). The manual aims to 'detail the procedures to be used when demanding, receiving, issuing and accounting for POL'.⁶⁰ Specific instructions for the maintenance of Army's ground fuel tanks could not be found when requested by the ANAO.

4.34 Army has no current endorsed policy that comprehensively addresses the management of fuel and lubricants. An Army logistic instruction⁶¹ provides guidance for the safe handling of fuel and lubricants products, in the absence of more specific Defence instructions. The instruction covers minimum standards of practice, fuel installation and field operating procedures, operations for marine, aviation and LPG, and fuel quality control procedures. The instruction is currently being reviewed by JFLA. In the absence of its own detailed policies Army uses Air Force's instructions for aviation fuel management and for the maintenance of its aviation fuel storage facilities.

Air Force maintenance policy

4.35 An Air Force instruction on fuel storage facilities designates responsibility for the servicing and maintenance of Air Force mobile and fixed fuel installations. Another instruction concerns quality control of aviation and ground fuels, fuel sample testing and refuelling safety procedures.⁶² The ANAO was advised that the policies require updating.

4.36 Air Force has a Base Fuel Quality Control Officer who, along with CSIG regional office staff, have coordination responsibilities for the maintenance of fixed aviation facilities. In addition, the quality control officer also provides 'engineering certification that maintenance carried out on aviation fuel installations (by any party) is done so against appropriate Defence instructions and is satisfactory'.⁶³

⁶⁰ Manual of Equipment Management and Accounting, 1994, Vol 2, para 1602.

⁶¹ Army Logistic Instruction MM7-1 (draft), Preface, para 2.

⁶² DI(AF) AAP 7743.001-6 issued October 1977 and DI(AF) AAP 7002.012-2 issued March 1994.

⁶³ DI(AF) AAP 7743.001-6 (1977:103).

Service maintenance policies conclusion

4.37 Current Defence policies and guidelines for the maintenance of fuel storage facilities were developed by the individual Services. These policies vary in their level of comprehensiveness. None is current. The ANAO considers that Defence should ensure that the draft tri-Service Military Bulk Fuel Storage Maintenance guideline is completed and formally issued as soon as possible. This would bring Service fuel storage maintenance procedures up to date and provide a uniform basis for the servicing and maintenance of ADF fuel installations.

Fuel facility maintenance

4.38 The CSIG Infrastructure Division manages on a national basis all buildings, infrastructure and property and is responsible for all 'building owner' functions, such as property policies, repairs and maintenance. Within this Division the Infrastructure, Planning and Environment Branch has responsibilities that include the formulation of environmental policy, advice on environmental aspects of Defence activities and compliance with environmental requirements. Under the Division, the Estate Management Branch is responsible for the corporate property management of the 12 CSIG Regional Infrastructure Centres in the delivery of facility operations.

4.39 Maintenance work on fuel facilities is contracted out by CSIG under Comprehensive Maintenance Contracts (CMC). These contracts include responsibilities for undertaking routine and unscheduled work for General Building and Facilities Maintenance and Fixed Plant and Equipment Maintenance in a single contract. These performance-based contracts are used to engage sub-contractors to undertake maintenance work for a tendered sum. Contractors are to provide all necessary personnel and resources to undertake the work detailed in the maintenance specification. When work is sub-contracted the primary contractor is responsible for ensuring that the sub-contractor's work meets Defence requirements.

4.40 The contracts refer to Defence Instructions on routine maintenance of facilities and require the contractor to become familiar with the content of the instructions. Defence should seek to ensure that contractors fully understand the servicing requirements for fuel facilities, and that the primary contractor informs sub-contractors of these requirements.

4.41 There is no designated CSIG position with responsibility for assessing the work of contractors. Instead the primary CMC contractor is responsible for supervising the maintenance work. The current CMC arrangements are designed to give the contractor an incentive to undertake the maintenance well, in order to have the contract renewed. Although it is in the contractor's best interests to

ensure the work is of a high standard, Defence personnel indicated that this is not always the case, as rectification work is sometimes required.

4.42 The survey results for Navy and Air Force fuel facilities indicated a low level of satisfaction with facility maintenance, as shown in Figure 3.⁶⁴ Fuel facility supervisors stated in the survey that it was often necessary to explain the work required and to supervise the sub-contractor. Others commented that contractor staff lacked experience and familiarity with the equipment and operations of a fuel facility, were poor at communicating and took too long to complete maintenance work. The ANAO considers that Defence should ensure contractors have appropriate experience and qualifications prior to the commencement of work and that the work is carried out according to Defence requirements.



Figure 3 Navy & Air Force satisfaction with fuel facility maintenance

Source: ANAO fuel facility survey results, 2001.

4.43 The draft tri-Service Military Bulk Fuel Storage Maintenance guideline states that 'all maintenance on bulk fuel installations and regulated equipment be clearly documented ... regardless of service'.⁶⁵ Maintenance records for some fuel facilities were unable to be produced during audit fieldwork as the records were stored away from the fuel facility. The ANAO considers that maintenance records should be readily available to staff involved with the management of the fuel facility, in order to determine if appropriate work has been undertaken.

⁶⁴ There were insufficient Army responses to the survey to provide for a statistically valid sample.

⁶⁵ Defence Estate Management Guide, Book 4 Part 5 Chapter 12, Annex A:13.

Facility inspections

4.44 The Code of Practice issued by the Australian Institute of Petroleum states that fuel storage facilities should be regularly inspected by qualified personnel to assess the condition of the tanks and auxiliary equipment and to identify any anomalies in operational procedures.⁶⁶ A routine inspection program and associated systematic record keeping enables the condition of key components of the facility to be monitored and the rate of deterioration to be determined. Judgements can then be made on the integrity of the facility to store fuel and to operate according to its design specifications.

Navy inspection policy

4.45 In outlining the maintenance requirements of Navy fuel installations ABR 6107 refers to the development of a Fuel Installation Maintenance Plan. A draft was prepared but not formally issued, although it has been used as a maintenance guide for Navy. Navy fuel installations have adapted the maintenance plan to suit local requirements and to assist in the determination of inspection requirements.

4.46 The draft maintenance plan outlines the responsibilities for the installation supervisor and servicing periods for the fuel installation. However, it does not identify either Navy or contractor staff responsibilities for the conduct and supervision of inspections. The plan requires the arrangement of timely maintenance, the provision of adequate fire protection and the promulgation of emergency procedures.

Army inspection policy

4.47 Generally Army does not operate military bulk fuels installations, with the exception of its aviation fuel holdings. Army's aviation fuel facilities are operated by contractors and follow Air Force instructions for inspection requirements. Army has no instructions specifying the inspection requirements for ground fuel storage facilities.

Air Force inspection policy

4.48 The Air Force instruction 'Aviation Fuel Installations—Basic Servicing Schedule' contains requirements for the periodic servicing and inspection of aviation fuel installations. Servicing and inspections are specified at regular intervals. At the six monthly interval filters, pumps and fuel storage tanks are checked against various criteria. Specific positions are nominated in the instruction as responsible for undertaking the inspections.

⁶⁶ Australian Institute of Petroleum, Code of Practice for Inspection and Integrity Monitoring of Large Steel Vertical Petroleum Storage Tanks, 1993.

4.49 A weekly update is provided to Headquarters Air Command on the fuel holdings at each installation and any problems that may exist with the tanks. The ANAO considers these reports to be a useful information tool.

Frequency of inspections

4.50 In the absence of a tri-Service policy for inspections, ADF fuel storage facilities are inspected and maintained in accordance with outdated single-Service instructions. Navy's policy ABR 6107 requires aviation fuel tanks to be internally cleaned biannually and marine diesel tanks to be cleaned every three years. During cleaning, a full tank integrity inspection is undertaken. An internal tank clean requires sediment to be removed and surfaces to be repainted. Air Force requires its aviation fuel tanks to undergo an internal inspection every two years.⁶⁷ Army does not specify the frequency of inspections for its ground fuel storage facilities. Service documentation indicates that a number of fuel storage tanks are overdue for their programmed inspection and cleaning processes.

4.51 The draft of the Military Bulk Fuel Storage Maintenance guideline requires different levels of servicing (and inspection) to be undertaken at appropriate time intervals ranging from daily to ten yearly. The guideline would provide fuel facility operators with scope to modify inspection requirements according to a number of requirements eg. climatic variations and equipment manufacturers' instructions. The Service representatives at JFLA have expressed interest in updating current inspection and maintenance instructions and have noted that the Military Bulk Fuel Storage Maintenance guideline being developed should enable the implementation of an appropriate inspection regime for ADF fuel storage facilities.

Security of fuel storage facilities

4.52 The fuel installation inspection checklists developed by the petroleum industry include a section on security of the facility. Checks are made on security procedures, the visits register, control of keys, fencing and gates. During the course of audit the ANAO was not made aware of any major security issues in relation to fuel facilities. However, in the fuel facility survey, one location commented that a lack of security fencing enabled unauthorised entry to the facility. Defence noted that it has now undertaken a vulnerability and security assessment of its assets including fuel installations and that any security deficiencies will be addressed. The ANAO considers that security should be upgraded at those fuel installations with known security deficiencies.

⁶⁷ DI(AF) AAP 7743.001-6.

Management information

4.53 The Defence Estate Management System (DEMS) provides estate management information to CSIG personnel. DEMS is based on the Defence intranet. Maintenance requests are logged into DEMS/FM (Facility Maintenance) at the regional level and central office has the ability to review data input to the system.

4.54 However, Defence has no systematic means of giving fuel facility operators and others visibility of maintenance inspections. Instead some of the Service groups record inspection dates and maintenance on a spreadsheet, with data input manually. The ANAO considers that a central system for recording the results of all fuel facility inspections should be available to facility operators and central facility managers.

Facility inspection checklists

4.55 Service instructions do not have a uniform approach to detailing the scope and content of inspection procedures. The range of inspection items in these instructions is not as wide as the range included in inspection documentation used by the petroleum industry. Additional items on petroleum industry inspection checklists include: staff training; licences and documentation; driver safety; and vehicles.

4.56 Current industry practice includes an environmental health and safety checklist when inspecting fuel facilities. The checklist covers the areas of licences and documentation, staff training, work permits, emergency response, tank security and integrity, customer relations, incident reporting and investigations. Although an Occupational Health and Safety Manual for Defence exists, Army and Air Force currently have no comprehensive health and safety check list for operations at fuel facilities.

4.57 Navy's safety manual⁶⁸ covers requirements for the operation of machinery, chemical, electrical and fire hazards, and equipment to ensure the safety of personnel. It also contains a summary of procedures to be adopted for confined space entry requirements (ie. inside fuel storage tanks).

4.58 Inadequate training of personnel received comment during the course of audit fieldwork. The fuel facility survey revealed that 55% of Navy and Air Force fuel spills were due to human error. The ANAO considers that facility inspection checklists should incorporate a check on the adequacy and currency of staff training.

⁶⁸ ABR 5225 'Precautions against accidents—safety or personnel'.

4.59 JFLA is developing an inspection checklist for aviation fuel facilities. The checklist will cover topics such as environmental, vehicle and personnel safety. The ANAO considers that Defence should develop a tri-Service facility inspection checklist that incorporates industry best practice. This should be undertaken as a collaborative effort between CSIG, JFLA and the Services. In developing the checklist scope should be allowed for the incorporation of Service specific requirements.

Fuel facility audits

4.60 JFLA documentation identifies the conduct of fuel facility audits as one of its functions. Fuel facility audits are conducted independently of the facility operators and comprise a review of the adequacy of facility infrastructure and operating procedures. The audits involve a wider range of test procedures than those used in the routine inspections currently undertaken as part of scheduled facility maintenance (eg. the audits incorporate environmental health and safety checks). At the time of audit fieldwork, JFLA commenced two fuel facility audits: one of an Air Force fuel facility and the other at an Army aviation fuel facility. The criteria used in these audits to assess the fuel facilities are similar to those used in the commercial petroleum sector.

4.61 The UK Defence Fuels Group is responsible for conducting 'independent inspections and licensing' of all Ministry of Defence bulk fuel installations. All bulk fuel installations are inspected every three years and, if satisfactory, a licence is issued for the facility to operate. The inspections cover operating procedures, maintenance (eg. tanks, pumps, pipelines and electrical systems), pollution control, environmental aspects, training, and health and safety. If installations fail inspection, rectification works are required before a licence can be issued. If there is an unacceptable safety or environmental risk, a prohibition notice may be issued. A prohibition notice places responsibility for continued operation on the officer in charge, who may subsequently be liable to civil prosecution in the event on an incident. In the two years that DFG has undertaken the program, a high percentage of Defence fuel installations have been inspected.

4.62 A similar approach to that used by DFG could be adopted by JFLA in its audits of ADF fuel facilities. The ANAO considers that Defence should implement a rolling program of Defence fuel facility audits to ensure the adequacy of facility infrastructure and operating procedures.

Emergency response procedures and equipment

4.63 Australian Standard AS1940⁶⁹ requires emergency response plans to be available at all bases. The Defence (Navy) Instruction on reporting and managing oil spills specifies responsibilities for oil spill reporting and emergency management.⁷⁰ The environmental protection section of ABR 6107 requires updating to reflect the requirements of this instruction.

4.64 Under the Defence (Navy) Instruction the Harbour Master is to be informed of all oil (fuel) spills originating from Naval assets. Pollution reports must also be given to the local Naval authority, MHQAUST and MA-Sydney. The instruction details the equipment required to address initial containment of oil spills for ships and establishments, and also notes that the most likely oil spill to be encountered in the Navy will be F76. F76 is light, with a high dispersion rate and containment is difficult. Each Navy establishment has various types of booms and absorbent materials to contain spills. Other methods that can be used to disperse fuel spills include natural wave action and surface agitation using boat propellers. Ships have standing orders on oil spills that are to be reviewed annually.

4.65 Army has no formal emergency response policy for operations at fuel facilities or for the handling of fuel spills. A draft Army Logistic Instruction, MM 7-1, is intended to cover safety and emergency response procedures when working with fuel. It is intended that the instruction will contain procedures for working in confined spaces, pollution prevention and control and safety precautions. An Air Force instruction identifies the risks associated with aircraft refuelling and provides precautions.⁷¹

4.66 All facilities inspected by the ANAO had emergency response procedures and equipment available. In office areas emergency response plans were clearly displayed. At refuelling areas spillage materials and fire fighting equipment were available and located within distances according to Service instructions and AS1940.

Recommendation No.6

4.67 The ANAO recommends that, to maximise the operational effectiveness of fuel facilities, Defence:

a) ensure that a tri-Service military bulk fuel storage maintenance guideline is developed and issued as soon as possible; and

⁶⁹ Australian Standard AS1940, The Storage and Handling of Flammable and Combustible Liquids, 1993.

⁷⁰ DI(N) LOG 21-4, issued August 2000, is based on The International Convention for the Prevention of Pollution from Ships 1973, as modified by the Protocol of 1987 (MARPOL).

⁷¹ DI(AF) AAP 7002.012-2 Fire risks' Section 3, Chapters 1–2.

b) implement a rolling program of fuel storage facility audits to ensure the adequacy of facility infrastructure and operating procedures.

Defence response

4.68 Defence provided the following response to Recommendation No.6:

- a) Agreed.
- b) Agreed.

Environmental aspects of fuel storage

4.69 ADF fuel storage facilities vary greatly in their location, capacity, state of repair and, therefore, in their potential impact on the environment. Other factors relevant to this impact include the type of construction and age of the facilities. Modern installations are designed to minimise contamination, are generally constructed above ground and have an adequate level of 'bunding' or capacity to contain a spill.

4.70 Defence currently requires that all fuel transfer capabilities be exercised annually in order to maintain expertise in handling and safety, as well as environmental procedures. The *Environmental Protection and Biodiversity Conservation Act 1999* sets parameters for Defence to assess the environmental impacts of its fuel storage and handling activities, using Environmental Certificates of Compliance.⁷² These certificates are issued by CSIG and set conditions on the manner in which the training is undertaken. The conditions are designed to reduce contamination and therefore limit the environmental impact of the training activities.

4.71 Environmental Certificates of Compliance outline potential impacts, safeguards, controls and reporting procedures for fuel and lubricants transport and handling. After a training activity, post exercise reports are used to record the environmental impact of the activities, noting any environmental incidents.

4.72 As a Commonwealth entity Defence is not bound by State, Territory and local government environmental legislation.⁷³ However, where possible, Defence has committed itself to complying with that legislation. Environmental protection and management sections have been incorporated into Defence policies and procedures, where necessary.⁷⁴

⁷² The Environmental Protection and Biodiversity Conservation Act 1999 replaces the Environment Protection (Impact of Proposals) Act 1974.

⁷³ DI(G) 40-1 issued May 1995.

⁷⁴ DI(ADMIN) 40-2 Environmental Management DRAFT May 1997.

Environmental management and reporting

4.73 National Environmental Protection Measures are broad framework-setting statutory instruments that reflect national objectives for protecting particular aspects of the environment.⁷⁵ The implementation of these measures is the responsibility of each participating agency. All Commonwealth departments and agencies must report on implementation of relevant National Environmental Protection Measures to the Minister for Environment and Heritage by 31 July each year.

4.74 The National Pollutant Inventory database is one of the National Environmental Protection Measures. This is a public database designed to provide the community, industry and government with information on the types and amounts of chemicals being emitted to the air, land and water.⁷⁶ As this public reporting requirement has security implications, Defence is currently negotiating an appropriate level of reporting with Environment Australia. The ANAO was informed that fuel installations will be included in this reporting process.

4.75 Defence has undertaken an environmental management initiative to develop a geographic information system for mapping environmental site risks for Defence managed properties, including fuel facilities. The system will include identification of the 90 chemicals listed in the National Pollutant Inventory that could trigger an environmental problem. To date pilot studies have been completed for HMAS CAIRNS, Robertson Barracks and RAAF Pearce and the intent is to repeat the study for all major Defence establishments. In these studies fuel and lubricants were substances identified with the risk of triggering an accident. Once the system has been trialed successfully, the Department advised that it will be tailored to meet the needs of other areas in Defence.

Environmental Management Plans

4.76 Environmental Management Plans (EMP) are produced by Defence to establish a regime of effective environmental management, facilitate the implementation of environmental safeguards and provide a policy and management framework. An EMP describes the environment, identifies activities undertaken within the facility area and their likely impacts and prescribes the means for ongoing environmental management and for the

⁷⁵ National Environmental Protection Measures are developed by the National Environmental Protection Council, a body established by Commonwealth, State and Territory governments. The operation of the Council is covered under the National Environmental Protection Council Act 1994.

⁷⁶ Review of the National Environment Protection NPI NEPM for the National Pollutant Inventory: Discussion Paper, October 2000, p. 1.

avoidance and remediation of impacts.⁷⁷ EMPs detail the management tasks and monitoring procedures to minimise potential adverse environmental effects resulting from the development and use of an area such as a fuel facility. They include plans for pollution control, fire management, hazardous materials and waste management. EMPs for fuel storage and supply areas include environmental indicators and monitoring measures. Fuel storage and handling activities are analysed for potential environmental effects to surface or ground water, soil contamination, fire and explosion. CSIG is responsible for the provision of advice and assistance in the implementation of EMPs.⁷⁸

4.77 Defence notes in its EMPs that they should be regularly monitored to assess the effectiveness of Defence environmental management and to update their contents to reflect changed environmental management obligations or new, more informed environmental data. The EMP for Robertson Barracks, produced in 1995, states that 'the EMP will be formally reviewed every three years'. The Robertson Barracks EMP has not yet been reviewed, but Defence noted that this is now in progress. The ANAO considers that Defence should ensure that Environmental Management Plans covering fuel facilities are reviewed at the specified time intervals.

4.78 EMPs seek to minimise potential problems from fuel facilities, and establish positions of responsibility. Taskings include ensuring fuel storage and dispensing facilities are designed, constructed and operated in accordance with Australian Standards and accepted good industry practice, ensuring that bulk fuels are stored only in approved containers at approved locations and implementing inspection schedules for all fuel lines and storage tanks. A spillage response plan is also required to be constructed for the containment and control of leaks and fuel spills.

4.79 As not all Defence facilities currently have EMPs, a decision to develop EMPs is based on potential and probable environmental issues identified by regional environmental managers. It is intended that, ultimately, EMPs will be available for all defence bases and formally reviewed every five years. The ANAO considers that these Defence initiatives are appropriate and should continue to be pursued.

Environmental contamination

4.80 There can be a number of reasons for fuel contamination of the environment. Fuel spillages can result from either the poor condition of storage facilities (due to inadequate levels of maintenance) or to human error in fuel

⁷⁷ DI(ADMIN) 40-2 Environmental Management DRAFT May 1997, Annex B, para 1.

⁷⁸ ibid, para 10.

handling. Small spills often occur as a result of human error when refuelling aircraft and ships, and are generally cleaned up without environmental contamination.

4.81 Defence documentation detailed a range of more significant contamination incidents that have occurred in recent years. In 1998 contamination occurred at HMAS CAIRNS from a leak in a former jointly leased pipeline. A diesel spill of 2000 litres also occurred at HMAS STIRLING in October 1999. The oil spill response team deployed oil booms that contained the spill. Weaknesses in procedures, responsibilities and facilities were identified as contributing factors to the spill, in a subsequent investigation.

4.82 Significant spills occurred at RAAF Williamtown between 1993 and 2001. In 1993 AVTUR was discharged onto the Hunter Water Corporation's Water Reserve via a stormwater drain. The spill was attributed to the sub-standard performance of the trade waste intercept system. Once booms had been placed across the drain, AVTUR was removed using absorbent material. In 1999 a spill of approximately 4000 litres of AVTUR was found in an open stormwater drain on land adjacent to the base. The cause of the incident was the overflow of the contents of the fuel wash-down collection system into the stormwater system after heavy rain. Most of the fuel was recovered and disposed of safely. In February 2001 AVTUR was released from an upright tank into the quality control inspection holding tank. The amount exceeded the waste fuel tank capacity and excess spilled into the bunded area, out onto the roadway and into the stormwater drain. After activation of the emergency response plan, the fuel was contained and a defuelling tanker pumped fuel from the bund. Spill soaker pads were used on the stormwater drains.

4.83 The management systems in place at RAAF Williamtown did not detect possible problems or prevent the environmental incidents. Preparation of an EMP for this base has begun with the engagement of a consultant. The consultant's draft report commented that there had been limited investigations to assess the extent of contamination within soils on site but that ground water assessments have now been conducted.

Reporting of environmental incidents

4.84 Defence does not currently have a policy on reporting fuel spills.⁷⁹ A draft policy is being developed to cover the reporting of incidents, identification of responsibilities and the classification of incidents according to the size of the spill. The ANAO considers that this policy should be developed as soon as possible.

⁷⁹ Navy, however, uses DI(N) LOG 21-4 (dated 21 August 2000) for the reporting and management of oil spills.

4.85 CSIG Regional Environmental Officers (REOs) provide advice and environmental input for issues occurring on the base such as fuel spills and act as a liaison point between the base commanding officer and CSIG. Regions that contain environmentally sensitive Defence properties, such as the Northern Territory and North Queensland, tend to have more REOs.

4.86 A recent ANAO report⁸⁰ noted that REOs often became aware of environmental incidents indirectly, with the implication that REOs may not always be informed about fuel spills. Defence documentation obtained in the current audit also noted that fuel spills occur more frequently than are reported. CSIG considers that impacts of environmental incidents appear to be small, but risk assessments undertaken when EMPs are developed, as well as the ANAO fuel facility survey results, indicate that environmental incidents occur more frequently than are reported.

4.87 The ANAO survey asked fuel facility managers about the occurrence of environmental fuel incidents. All spills identified in the survey were investigated either at the fuel facility or base level. Current incidents are reported within the Service chain of command and involvement of the REO is at the base commander's discretion. Defence documentation noted that 'unless there is some real analysis as to why and how often these spills occur, and whether they are correctly handled in the clean up, we can't improve'.⁸¹ The ANAO considers that Defence should ensure that all significant spills are documented and their causes investigated. Given the wide range of environmental responsibilities for fuel facilities shared between CSIG and JFLA, there is a strong argument for these responsibilities to be clearly articulated in a customer service agreement.

Infrastructure issues

4.88 The ANAO identified a number of older ADF fuel installations that did not comply with the spillage containment requirements of AS1940 in that they were incapable of holding 110% of the capacity of the largest tank.⁸² Fuel facility survey results also indicated that operators had concerns over the suitability of containment bunding eg. some locations had bunding constructed from porous gravel. In some regions known to experience heavy rainfall the construction of containment bunding around the tankage was incapable of retaining fuel spills during heavy rainfall. No mechanisms were in place to pump out rain water and the facility simply relied on evaporation. In the event of a spill occurring at these facilities after rainfall, fuel could overflow from the bunding.

⁸⁰ ANAO Audit Report No.3 2000–2001, Environmental Management of Commonwealth Land, p. 58.

⁸¹ CSIG, Environmental Practice Section memorandum, 17 March 2000.

⁸² Australian Standard AS1940, *The Storage and Handling of Flammable and Combustible Liquids*, 1993, para 3.2.6.

4.89 Internal Defence correspondence has noted that 'some of our systems designed to contain minor spills, often proved to be inadequate'.⁸³ Past spills at RAAF Williamtown have resulted from the inadequacy of the facility infrastructure to retain fuel spillages.

4.90 The ANAO considers that Defence should undertake remedial action to address fuel installation infrastructure deficiencies and ensure that containment bunding and/or leak detection alarm arrangements for fuel facilities meet the minimum specified requirements. Defence has now advised that a works program for rectification of immediate problems at RAAF Williamtown commenced in 2001–2002.

Decommissioning of underground storage tanks

4.91 The ANAO was unable to identify a Defence policy for the decommissioning of Underground Storage Tanks (USTs). Australian standards specify the procedures to be adopted when abandoning USTs.⁸⁴ Tanks are to be removed from the ground and taken to an appropriate place for safe disposal. Alternatively they can be filled with an inert solid and all pipes and lines disconnected. Some abandoned Defence USTs have not been disposed of by these means, as some of these tanks have been found to contain liquids.

4.92 Old and abandoned Defence USTs are located throughout Australia. They require ongoing inspections and maintenance to ensure their structural integrity and to avoid environmental contamination. The ANAO was informed that Defence has suspended disposal activities for abandoned USTs in case the tanks may need to be recommissioned in the future.

4.93 The ANAO asked Defence about the number and location of abandoned USTs. The information was unable to be provided. CSIG has, however, undertaken work in some regions to identify the number of abandoned USTs. As part of this work UST management plans, forming a component of EMPs, are being prepared for some regions. Of the 145 storage tanks recorded in the Southern NSW region, 30 have been abandoned and the location of 10 of these is unknown. Without information on the number and location of abandoned USTs, CSIG is unable to maintain USTs according to Australian Standards.

4.94 The inability of Defence to identify the location of all underground fuel storage tanks could have environmental implications for the future. The ANAO considers that Defence should seek to identify the location of its abandoned underground fuel storage tanks; assess their condition; and take appropriate site rectification action.

⁸³ CSIG, Environmental Practice Section memorandum, 8 July 2001.

⁸⁴ Dangerous Goods Series, DG 310.

Recommendation No.7

4.95 The ANAO recommends that, in order to minimise the environmental impact of fuel facilities, Defence:

- a) undertake remedial action to address its fuel installation infrastructure deficiencies and ensure that spill containment systems and/or leak detection alarm arrangements for fuel facilities meet the minimum specified requirements; and
- b) identify the location of its abandoned underground fuel storage tanks; assess their condition; and take appropriate site rectification action.

Defence response

4.96 Defence provided the following response to Recommendation No.7:

- a) Agreed. Noting that remedial works will need to be managed within available funding. Any works program will address the highest potential environmental risks in the first instance with emphasis being placed on those fuel establishments that have a long term future.
- b) Agreed. The location, assessment and remediation of abandoned fuel tanks will form part of the ongoing program of prioritising environmental issues. However, this could involve significant funding impacts and would need to be considered and prioritised within Defence's budget.



Air Force 'above ground' aviation fuel storage facility

5. National Petroleum Industry Issues

This chapter identifies features of government policy bearing on the petroleum industry environment in which Defence conducts its fuel supply chain management functions. It briefly reviews those features relating to developments in the industry, the statutory framework for ensuring supplies and government environmental policies affecting the industry. The chapter finds that Defence's strategic liaison and consultation with the relevant government agencies could be improved in depth, extent and effectiveness. This would be facilitated by enhanced internal coordination within Defence.

Introduction

5.1 Since the end of World War II Australia has not faced significant petroleum shortages. With a strong petroleum exploration and development sector and four major refining corporations operating eight refineries around the Australian coastline, it has developed a measure of self-sufficiency in some refined products. It is less import-dependent on fuel oil than the United States and it is a net exporter of energy.⁸⁵

5.2 These circumstances have been favourable for Defence, which has generally been able to access the domestic sources of fuel it has needed while also being able to tap as necessary the international supply market (buying on the spot market offshore, for example, in situations of overseas deployments). The Southeast Asia petroleum refining industry has expanded considerably in a period of high economic growth, providing expanded sources of supply, especially from Singapore. These production facilities, while offering supply opportunities to the ADF, are also impacting on the shape and extent of the Australian industry through both surplus capacity and reduced refining costs.

5.3 The Australian petroleum industry is part of the global economy and is subject to continuing change. Prices and availability of products internationally are determined significantly by Middle East producers. Political developments affect these decisions. As the consumption of the industry's products results in production of hydrocarbons, the industry is exposed to the effects of anti-pollution measures and greenhouse gas controls imposed by governments. In the future, Australian production of oil is expected to decline, with oil self sufficiency reducing to 50% by 2005.⁸⁶

5.4 Defence has an interest in these wider developments in view of the dependence of the ADF on the continuing and timely availability of fuel for the

⁸⁵ Global Oil Production and the RAN, April 2001, A Gaczol, A Dallwitz, C Thomson, p. 6—quoting DOE-EIA 'Australia Country Analysis Brief'.

⁸⁶ Ibid., p.6—quoting CSIRO, 'Petroleum', www.csiro.au.

normal peacetime operation of its platforms, for surge capability in its supply chain, as well as for the sustainment of combat operations. Chapter 2 of this report identified a range of studies undertaken in different organisational units in Defence that reflect sensitivity to these matters. That chapter drew attention to the lack of any apparent underlying Defence-wide strategic coordination of the work being done and noted that a well-coordinated effort within Defence would involve obtaining the petroleum refining industry's input into strategic coordination of supply chain management.

5.5 This chapter identifies some key policy areas bearing on Defence's interests in fuel where government agencies outside Defence have prime carriage. These are:

- government policies for the petroleum refining industry—the Downstream Petroleum Products Action Agenda;
- national petroleum reserve stock policies, practices and arrangements which may directly affect Defence strategic capability;
- the liquid fuel emergency regime; and
- national fuel standards regulation.

5.6 The chapter examines the extent and nature of Defence's relationships with each of these policy areas which directly impinge on the fuel supply chain.

Government industry policies for the petroleum refining sector

5.7 The 'downstream' part of the Australian petroleum industry (ie, the petroleum refining and marketing component) has been experiencing declining profitability. It is facing high levels of competition, with the combined effects of new entrants, the developing import sector accessing an over-supply of petrol and diesel in the Asian region, and the very low international refining margins. In the year 2000 it reported its first underlying loss since 1991.⁸⁷

5.8 As one part of its industry policy statement initiatives the Commonwealth government launched the Downstream Petroleum Products Action Agenda (DPPAA) in November 1999. The DPPAA report, prepared with extensive inputs from industry and government agencies, stated that the Australian petroleum refinery industry 'is in crisis'.⁸⁸ It identified a number of issues, including taxation

⁸⁷ Downstream Oil Industry Financial Survey January 1996 – December 2000, Ernst & Young on behalf of the Australian Institute of Petroleum, December 2001, p. 2. See also Turning Point of Crisis: a Study of the Australian Oil Refining and Marketing Industry, for the Australian Institute of Petroleum, ACIL Economics, November 1997.

⁸⁸ Downstream Petroleum Products Action Agenda (DPPAA), Canberra, November 1999, p. 5.

and other regulatory arrangements, that affect the industry's international competitiveness, as well as the impact of tighter fuel standards in the greenhouse gas environment. It outlined directions that might lead to the industry's growth but stressed that it was the industry itself which was the traveller down any particular road, making the necessary investments: the government itself had no role in directing individual players on any course.⁸⁹ The government's function was to remove impediments to ongoing production and investment and to ensure that whole-of-government consideration was given to industry restructuring proposals.

5.9 The DPPAA recognised that the kind of industry restructuring that could emerge would be closure of certain refineries. The new structure might have fewer but bigger refineries and local refiners might produce the higher quality, cleaner fuel that Australia needs to meet its air quality and greenhouse emission targets.⁹⁰ This would leave considerable scope for imports, in respect of which the government stated its view that '…imported fuel and petroleum products should be able to compete equally with domestically-produced fuel and products, and that the outcome should be determined by the market, not by any proscribed [sic] ratio of imports to domestic production.^{'91}

5.10 The DPPAA noted that the ability of Australia to obtain continuous supplies of essential transport fuel and other refined petroleum products was of strategic importance, both from a national security and an economic perspective. It noted that this took on particular significance at times of international energy crisis or when there were transport fuel shortages.⁹²

5.11 The document stated that, although the Department of Defence 'does not regard the Australian refining industry as being critical infrastructure, it has indicated that it regards the industry as being of strategic importance in terms of meeting the nation's defence needs'.⁹³

5.12 The DPPAA tasked a working group with membership linking government and industry personnel to oversight the implementation of the DPPAA process. The Downstream Petroleum Working Group operates under the auspices of the Ministerial Council for Energy and is serviced by the Petroleum Industry Branch of the Petroleum and International Energy Division in the Department of Industry, Tourism and Resources (DITR). This Branch of DITR also monitors and advises on developments in the petroleum refining industry in Australia.

⁸⁹ *'Petroleum refining: at the crossroads—which way does government point?'*, 2000 Outlook Conference paper by Rick Pickering, DITR, February 2000.

⁹⁰ Downstream Petroleum Products Action Agenda (DPPAA), Canberra, November 1999, p. 14.

⁹¹ ibid, p. 31.

⁹² ibid, p. 13.

⁹³ ibid, p. 65.

5.13 The ANAO notes that the DPPAA raises a number of matters that are of direct concern to management of the fuel supply chain, including possible significant changes in patterns of production of specialised products and the whereabouts of key supply points across the Australian continent. The DPPAA foreshadows possible significant change in the distributed structure of the Australian petroleum refining industry and in the technical specifications of products products.

5.14 Chapter 2 briefly examined the Defence analytical work being undertaken in DMO's Industry Division that may result in a form of Defence Industry Capability Agenda status for the petroleum industry. This work, if associated closely with DITR's analytical activity on the industry, may impact on Defence views concerning the strategic importance of self-sufficiency in certain products.

5.15 There is therefore a sound basis for the Defence analysis to be considered in developing a whole-of-government approach to these matters. To this end it would be appropriate for Defence to establish a closer relationship with the activities of the DPPAA Working Group and with the related industry monitoring and analysis roles of DITR.

National petroleum reserve stocks

5.16 The Department of Industry, Tourism and Resources has responsibility for administering Australia's international obligations, as a member of the International Energy Agency, to hold minimum reserve stocks of crude oil and/ or petroleum to meet national and international emergencies. Australia's obligation to hold the equivalent of a minimum of 90 days of imports is met by the quantity of stocks in the petroleum supply chain. This includes the petrol and diesel in the fleet of delivery tankers. DITR officers informed the ANAO that Australia currently holds reserves of petroleum and petroleum products within the supply chain equivalent to over 310 days' net imports. As the International Energy Agency framework does not require Australia to hold a separate physical strategic reserve stockpile, the market operates to control demand. Supply and utilisation are thus closely balanced.

5.17 These circumstances underline the importance to Defence of bringing rigour to the maintenance of adequate reserve stockholdings of relevant fuel products within ADF fuel installations (this matter is examined more fully in Chapter 4). DITR officials were unaware of any Defence activity in associating strategic Defence reserve stockholding policies with national infrastructure arrangements.

5.18 Another dimension of the finely balanced pattern of national reserve stocks in Australia is that unforeseen ADF surge requirements can impose unwelcome

strains on regional availability of products for the wider economy. In discussing issues involved in requirement determination for fuel, JFLA stated in an internal document in 2001 that:

Accurate long term forecasting to the Oil Companies especially surge usage or sustainability requirements at remote locations is the major challenge for requirements determination. This is due to the fact that there is limited flexibility for Oil Companies at present to meet surge usage unless commercial customers are affected by shortfalls and that the distribution assets in remote locations are limited. Also in the past normal forecasting by the different Services has largely been haphazard. All three Services and HQAST are working on this aspect of the supply chain.⁹⁴

5.19 The ANAO was advised during audit fieldwork that the replenishment needs of a visiting US Navy vessel during the exercise Tandem Thrust in North Queensland in early 2001 had such a regional surge impact. The vessel's needs were supplied. The adverse effects on the local economy were not of long duration on this occasion, but they resulted in adverse media coverage for Defence.

5.20 Neither JFLA nor JLC have flagged in their detailed business planning the development of an analytical or research-based assessment of petroleum product stocks, their distribution in areas of Australia that may come under pressure to supply exceptional ADF needs and ways in which supply continuity might be preserved for all customers of the refining industry. They have not sought to establish a policy-level consultative dialogue with DITR nor with the industry (see Chapter 2) on this issue.

5.21 The ANAO suggests that JLC and JFLA should take the lead, in consultation with the single Services and HQAST, to pursue the ADF's fuel stockholding needs and issues with DITR.⁹⁵ DITR officers indicated to the ANAO field team that the Department would welcome such contact as it would assist the government in obtaining sound whole-of-government perspectives on petroleum industry issues when policy decisions were taken.

The liquid fuel emergency regime

5.22 Arrangements for ensuring availability of goods and services in emergencies are regulated by legislation. Both Commonwealth and State spheres have relevant peacetime statutory instruments in the fuel area. The centrepiece of the system is at Commonwealth level, with the *Liquid Fuel Emergency Act 1984* (the LFE Act)

⁹⁴ 'Brief for CJLOG on Supply Chain Arrangements for Fuel to the ADF', p. 1.

⁹⁵ The ANAO notes that the creation the Strategic Logistics Branch should provide an opportunity to pursue these needs and concerns in a more integrated way.

which replaced the *Liquid Fuel (Defence Stocks) Act 1949.* The Act provides that the Governor-General may declare a 'national liquid fuel emergency', to help ensure supply of refined liquid petroleum products from 'relevant fuel industry corporations' (though its transport is not so mandated by the legislation). The Act provides the structure in which the Commonwealth would declare and manage a national fuel supply emergency. The legislation is of general application: it is not specific to Defence needs and does not specify particular arrangements for the ADF. The ADF could, however, be included among the essential users of liquid fuel products.

5.23 The LFE Act is administered by the Minister for Industry, Tourism and Resources. In DITR the Petroleum Industry Branch is responsible for day to day administration. It chairs the Commonwealth/State administrative mechanism set up under the Act to implement its provisions. This mechanism is the National Oil Supplies Emergency Committee (NOSEC).

5.24 A Defence Instruction provides the framework for Defence liaison with the national emergency authorities in seeing that Defence needs would be met in such an emergency.⁹⁶ This instruction dates from mid-1995 and requires revision to take account of administrative changes in the Commonwealth, States and Territories over the last six years. The point of contact in Defence is specified as Assistant Chief of the Defence Force (Logistics). The current equivalent position in Defence is CJLOG.

5.25 DITR officers advised the ANAO that NOSEC is currently reviewing Australia's National Fuels Supply Emergency Response Plan.⁹⁷ The review will update existing procedures and take account of arrangements that have been developed by State and Territory governments to manage fuel supply disruptions. State and Territory jurisdictions are also reviewing fuel supply emergency response measures with a view to achieving greater consistency in fuel shortage management options.

5.26 JFLA has participated in the NOSEC, including the meeting initiating the evaluation. JFLA representation has not brought to the NOSEC deliberations a strategic Defence interest in this review of the national emergency regime's arrangements. The ANAO notes that parts of Defence's strategic review work in the civilian infrastructure area of fuel supply chain management (see Chapter 2) would provide Defence with a basis to inject relevant ADF perspectives into this interdepartmental and joint Commonwealth/State planning forum.

⁹⁶ DI(G)LOG 07-3 Management of Fuel During Periods of Shortage or Supply Disruption, 5 July 1995.

⁹⁷ The review was commissioned at the last NOSEC meeting in December 2000. Prior to this, NOSEC had not met since April 1999.

5.27 In particular the Defence study commissioned by the then National Support Division to examine the legislative framework impacting upon the ability of the ADF to access civilian infrastructure, services and products of the fuel industry (see Chapter 2), is directly relevant and useful to the NOSEC review process. That study had concluded that there exists no express recognition of ADF fuel supply needs in any of the existing legislative regimes. It found that there is no uniformity in the legislative regimes applicable in the different Australian jurisdictions and that the Commonwealth, State and Territory governments have different procedures for engaging statutory processes. It recommended that standardisation of the regimes would assist the ADF to act quickly in times of fuel shortage.

5.28 The ANAO considers that JFLA needs to be able to participate in the Commonwealth's policy-level consideration of issues involved in ADF access to fuel supplies at an appropriate strategic level. The current review presents an opportunity to be involved at a possible turning-point in consideration of national and Commonwealth/State arrangements.

National fuel standards regulation

Legislation

5.29 The *Fuel Quality Standards Act 2000* implements key parts of the Commonwealth government's policy for reducing fuel related pollution and emissions, facilitating the adoption of better engine and emission control technology and enabling more effective operation of engines. The Act, and attendant Regulations that set the relevant technical specifications, took effect from 1 January 2002, and will replace State legislation on fuel pollution, thus establishing uniform, nationally consistent fuel standards across Australia in the period 2002 to 2008.

5.30 The legislation will be monitored and enforced along the fuel supply chain. It was developed against the background of the Downstream Petroleum Products Action Agenda. The government has stated that significant investment will be required by the refining industry to meet tighter fuel standards. It notes that, as the different refineries have different capacities to meet the new fuel specifications, one or more refineries may consider closing, depending on the final fuel standards implemented and the current world turndown in the refining industry.⁹⁸

5.31 Accordingly, although the scheme does not at this stage regulate standards for diesel products used for marine purposes, nor AVTUR/AVGAS for aviation

⁹⁸ Fuel Quality Standards Bill 2000, Explanatory Memorandum, p. 22, p. 28.

use, the industry consequences could directly affect supply of products in these groups to the ADF.

5.32 The Act sets up a National Fuel Standards Consultative Committee to advise the Minister for the Environment and Heritage on determinations, decisions and guidelines issued under the legislation. The Minister appoints the members of this committee.⁹⁹ The Minister has power under the Act to issue variations or exemption provisions for standards that are promulgated in the Regulations.

Future developments and consultation opportunities

5.33 Administration of the scheme involves a range of technical issues in the management of the standards. Policy development under consideration deals with measures to encourage use of alternative fuels such as diesohol and compressed natural gas. Utilisation of the additive 'cleanerburn' to diesel in lieu of reduction in sulphur content (as prescribed in the Regulations¹⁰⁰), but with similar environmental benefits, was under active review during audit fieldwork. The extension of the regulatory system to marine and possibly aviation use is not ruled out. All these activities would seem relevant to the ADF's use of petroleum products.

5.34 As noted in Chapter 2 of this report, internal Defence-commissioned studies have identified government environmental policy directions as having a possible impact on continued availability to the ADF of fuels with specifications matching ADF equipment requirements. These studies create a framework for Defence to articulate a strategic position on these matters and to communicate its interests to the relevant Commonwealth agencies, in this case Environment Australia.

5.35 The ANAO considers that Defence should position itself to obtain full and ongoing information about policy and technical developments in environment protection measures affecting the petroleum industry. This information would, in turn, facilitate the capacity of Defence to influence policy developments so that they take account of Defence strategic interests. The Environment Quality Division of Environment Australia has responsibility for many relevant issues.

5.36 A number of different areas within Defence have interests in these matters. They include those responsible for the development of Defence's own environmental protection obligations and standards in regard to fuel facilities, the focus of which is in CSIG (see Chapter 4).

⁹⁹ Fuel Quality Standards Act 2000, s25, s26.

¹⁰⁰ The legislation provides for the reduction of sulphur content in diesel from 1300 parts per million (ppm) to 500 ppm on 1 January 2002, with further reduction to 50ppm in 2006.

5.37 Environment Australia officers indicated to the ANAO that Defence has expressed views on these matters from time to time and provided coordination comment on relevant Cabinet submissions on proposed new policy. They indicated, however, that the contacts have been from different areas of Defence and no single point of coordination on Defence's fuel needs was evident.

5.38 The ANAO noted that enhanced internal coordination in Defence would be required to establish an agreed 'environment' contact point among all the Defence units with fuel interests. Decisions on the nomination of such a primary contact point, and the *modus operandi* for such a position, would be possible if the improved internal coordination arrangements and service-level agreements proposed in Recommendation No 1, in Chapter 2, were implemented.

5.39 The ANAO understands that Environment Australia would welcome a fuller dialogue with Defence on these issues, both to obtain better information on Defence needs and to allow Environment Australia to access Defence thinking on technological and other development activities with regard to its utilisation of petroleum products.

Conclusion

5.40 The issues highlighted in this chapter suggest that there is significant scope for Defence to improve its strategic liaison and consultation with relevant government agencies, concerning the petroleum industry environment.¹⁰¹ The ANAO considers that Defence should:

- participate more actively in the Downstream Petroleum Products Action Agenda Working Group and with the related industry monitoring and analysis roles of the Department of Industry, Tourism and Resources;
- pursue the ADF's fuel stockholding needs with the Department of Industry, Tourism and Resources;
- participate at a strategic level in National Oil Supplies Emergency Committee deliberations and in national fuel emergency regime arrangements; and
- identify a single point of contact within Defence so as to enhance dialogue with the Department of the Environment and Heritage concerning issues affecting the petroleum industry.

¹⁰¹ The potential for Defence to obtain value from closer liaison with the petroleum refining industry, for example, with the Australian Institute of Petroleum, is identified in Chapter 2.

Recommendation No.8

5.41 The ANAO recommends that, to assist its strategic planning, Defence enhance its level of consultation with relevant departments and other bodies concerning the petroleum refining industry.

Defence response

5.42 Agreed. Noting that there is scope to build on existing liaison and consultation with industry.

an

Canberra ACT 24 April 2002

P. J. Barrett Auditor-General

Appendices

ADF fuel types

Fuel Type	Name	Description
F18	AVGAS	Military specification for aviation gasoline (used in piston engine aircraft).
F34	AVTUR + FSII	Military specification for jet turbine fuel with additives such as lubricants and anti-icing inhibitor.
F35	AVTUR or Jet A1	Commercial jet turbine fuel.
F44	AVCAT+ FSII	Military specification for jet turbine fuel with additives to provide a higher than standard flashpoint (used in ship-borne aircraft).
F76	Naval Distillate or Marine Diesel Oil	Military specification for marine diesel fuel.
ADO	Automotive Diesel Oil	Commercial fuel for diesel engine vehicles.
ULP	Unleaded Petrol	Commercial fuel for petrol engine vehicles.
LRP	Lead Replacement Petrol	Commercial fuel for petrol engine vehicles.

Source: Department of Defence documentation.

Recent Reviews of the ADF Fuel Supply Chain

A number of Defence initiated reviews have been undertaken in recent years on the form and structure of the ADF fuel supply chain. These include:

- Defence Inspector-General Division, Management Audit Branch, Audit Report *Fuel Management in Defence,* No ACT96004, September 1996;
- Support Command (Navy) Project Team, *Transfer of Responsibility for the Management of Fuels and Lubricants*, September 1997;
- KPMG/National Support Staff, Critical Infrastructure Project Phase 2, *Fuel Report*, KPMG, April 2000;
- Support Command Australia (Navy), *Future Directions for the Fuel and Lubricant Supply Chains*, S.I.P. Pty Ltd, September 2000;
- Directorate of Navy Capability, *Study into the Requirements for Contingency Stocks of F76 Dieso*, November 2000; and
- Navy Headquarters/RAN Sea Power Centre, Future Fleet Study Eight, *Global Oil Production and the RAN*, April 2001, Dr Andrew Gaczol, Ms Anne Dallwitz and Mr Chris Thomson.

Source: Department of Defence documentation.

Critical Infrastructure Project—Fuel Report

1. The Critical Infrastructure Project—Fuel Report, undertaken by consultants KPMG, was intended to enable Defence to develop 'a targeted approach to engagement with Industry and government' (Report, p2). Starting with an analysis of the Australian refining and marketing industries, international connections and the main regulatory features, the report commented on trends in the industry and its capacity to restructure to become more efficient in the light of Competition Policy requirements. Over three time points (1999, 2005 and 2020) the report analysed and identified a range of 'critical interdependencies' for the fuel sector, such as those with the 'Information Technology' sector and the 'Third Party Logistics Providers' sector. It identified 'industry vulnerabilities', 'Defence vulnerabilities' and offered advice to Defence on 'mitigation strategies' to deal with these vulnerabilities.

2. Specific industry vulnerabilities or broad risk areas were defined in such categories as 'Political', 'Supplier', 'Substitutes', 'Barriers to Entry' and for 'Social, Cultural and Environmental'. This last category reflected assessments that there would be an increasing influence of environmental policy and compliance on the industry in the periods of the two forward timeframes. The report found a mismatch between the industry's and Defence's strategic planning horizons in that the 2020 timeframe attracted very little debate or comment from the industry representatives, compared to its focus in Defence planning scenarios.

3. In the conduct of the project, 'Defence vulnerabilities' were identified in a mini-forum of Defence stakeholders held between the two industry workshops. These vulnerabilities were rated across the same categories of risk that had been set up for the industry. The project report consolidated them in the 'Broad Vulnerability Areas' of 'Supplier', 'Operational' and 'Political' where the risk rating for Defence had been assessed as 'High'.

4. The project developed a number of 'potential mitigation strategies' to address these identified Defence vulnerabilities. These were for Defence to:

- work in conjunction with industry to leverage established emergency management strategies already in place, and adapt to reflect Defence needs for utilisation during a fuel emergency;
- establish fora to facilitate effective lobbying of government and industry to articulate Defence requirements during periods of mobilisation, and to emphasise the continuing requirement of domestic refining capability to guarantee national security;

- address 'skilled fuel personnel' shortages; and
- escalate a program of reduction of fuel types to limit reliance on specialist fuels (Report, p63).

5. In prioritising actions further the report referred to Defence vulnerabilities in the following terms:

It may be considered as important to prioritise Broad Risk Areas for action that arise purely from specific circumstances, independent of Industry sector activity. The communication of these vulnerabilities to Industry and the development of a collaborative approach towards their amelioration may also alter the further prioritisation of mitigation strategies. The most appropriate example in the Fuel sector is in the Broad Risk Area of Supplier where it has been identified that the possible reduction in domestic refinery as a result of competition pressure from the Asian markets may have a dramatic effect on Defence's vulnerability in this area. Reliance on overseas supplies may delay ADF response or sustainment during periods of mobilisation. (Report, p64)

6. This report was produced through syndicate discussions of industry and Defence representatives. The project represents a high-water mark in Defence collaboration with the petroleum industry to jointly map strategic options for Defence in reaching understanding of the 'irreducible minimum' of petroleum industry products required to operate the ADF effectively.

Source: National Support Staff, Critical Infrastructure Project Phase 2, *Fuel Report,* KPMG, April 2000.

National Support Agenda

1. The Policy, Guidance and Analysis Division, which reports to the Deputy Secretary, Strategy, now has responsibility to coordinate the implementation of the government's policy intent of integrating Defence's fulfilment of its mission with the resources, expertise and effectiveness of the wider national and civil sector. This program is called the National Support Agenda. The ADF's fuel and lubricants needs, which must be sourced from this entirely civil sector industry, are covered by this policy intent.

2. The National Support Agenda was formally inaugurated in the Defence and Industry Strategic Policy Statement issued by the government in 1998. In this Statement, which is the most recent formulation of government policy on defence and industry, 'National Support' is presented as part of the government's vision for Defence, which 'draws together the ADF and the wider community as partners in providing for the nation's defence'.

3. In the immediate aftermath of publication of this statement, the function of coordination of its implementation was assigned to a new Division specifically dedicated to the National Support program. However, this Division was discontinued as part of the Defence reorganisation in mid 2000 and its functions were re-assigned, with other functions (such as the Critical Infrastructure Needs of the former Division) being allocated to the Industry Division in DMO.

4. The National Support Agenda is now principally the responsibility of the National Support Policy Branch (one of the three Branches in the Policy, Guidance and Analysis Division - formerly the Military Strategy, Preparedness and Support Division).

5. The Branch has assembled capability to maintain and develop a database of industry and economic facilities relevant to fuel supply chain analysis. It has sought to maintain and develop relationships with other departments with economic and industry policy responsibilities. It conceived and developed initial planning for a possible Defence approach to government for the establishment of a broad strategic industry policy approach that would address key issues in industry support for mobilisation and sustainment, including for fuel. The initiative, while continuing to be developed, has been put on 'hold' pending progress being made to clarify directions in the Critical Infrastructure Needs Project.

6. As part of its review of issues in Defence accessing petroleum products in possible supply emergencies, the Branch commissioned a review in 2000 from a

legal expert located in Defence analysing the broad legal framework in the Commonwealth and State spheres in Australia which would apply to Defence's access to the petroleum refining industry. The review found that legislation in Australia affords no statutory recognition of the ADF's needs to access supplies and that the legal regimes in the various States are diverse. It identified key threshold issues that Defence would need to address in dealing with local or national supply shortages. No similar review appears to have been undertaken before. It is understood that consideration in Defence of the issues and recommendations presented in this report is continuing.

7. Early in 2001 a senior officer with oversighting responsibilities for the National Support Branch was appointed as the Chair of the Task Force conducting the Review of the adequacy of current arrangements in the light of the ADF experience of the East Timor deployments.

Source: Department of Defence documentation.

Bulk Liquid Distribution Study

1. The Bulk Liquid Distribution Study, Joint Project 2059 (JP2059), was designed to enhance Army and Air Force's ability to distribute bulk liquid, focusing on fuel and water. The project aims were to provide the ADF with the capability to transfer bulk quantities of aviation and vehicle fuels from support vessels to storage facilities on shore. ADF operations in East Timor highlighted the need to enhance this capability to meet higher levels of operational tempo. During the first five months of the deployment, Australian forces are reported to have used 2.79 million litres of AVTUR and 3.72 million litres of diesel.¹⁰²

2. Initially scheduled for funding in 2004–2005, the project was advanced due to lessons learned from operations and as existing equipment approached the end of its service life. JP2059 was designed to fr ee up road transport assets for forward transportation and allow other assets to be multi-tasked. The project was divided into three phases, with the first two now completed.

3. Phase 1 consisted of a project definition study to determine the extent of distribution support required and to identify options for improving bulk liquid distribution.

4. Phase 2A concerned the distribution of fuel from naval and civilian support ships to shore storage facilities. Three sub-capabilities were considered to enable this to be undertaken. The Light Transfer Capability consisted of several 31 000 litre fuel bladders to be carried by landing craft such as the LCM 8. The Medium Transfer Capability consisted of three 85000 litr e 'Dracone' towed flexible barges. The Dracones can be beached or brought alongside a jetty to transfer the load to a shore facility. The Heavy Transfer Capability consisted of a floating pipeline with a 2km reach from shore and a flow capacity of 70000 to 180000 litr es per hour.¹⁰³

5. Phase 2B consisted of a pipeline capability to transfer bulk quantities of fuel inland from the beach and inland fuel storage installation tanks to support operational rates of effort for deployed forces. The tanks had capacities between 45000 and 136 000 litres.

6. Phase 3 of JP 2059 concerned the provision of water treatment facilities to enable drinking water to be produced from a variety of sources such as salt water.

Source: Department of Defence documentation.

¹⁰² '*Timor operations fuel ADF supply project*', Jane's Defence Weekly, 6/9/2000.

¹⁰³ ibid.

Performance Audits in Defence

Set out below are the titles of the ANAO's previous performance audit reports on Defence operations tabled in the Parliament in the last five years.

Audit Report No.34 1996–97 ADF Health Services Audit Report No.5 1997–98 **Performance Management of Defence** *Inventory* Audit Report No.34 1997-98 New Submarine Project Audit Report No.43 1997–98 *Life–cycle Costing in Defence* Audit Report No.2 1998–99 **Commercial Support Program** Audit Report No.17 1998-99 Acquisition of Aerospace Simulators Audit Report No.41 1998-99 General Service Vehicle Fleet Audit Report No.44 1998-99 Naval Aviation Force Audit Report No.46 1998-99 **Redress of Grievances in the ADF** Audit Report No.13 1999-2000 Management of Major Equipment **Acquisition Projects** Audit Report No.26 1999-2000 Army Individual Readiness Notice Audit Report No.35 1999-2000 **Retention of Military Personnel** Audit Report No.37 1999-2000 Defence Estate Project Delivery Audit Report No.40 1999-2000 Tactical Fighter Operations

Audit Report No.41 1999–2000 **Commonwealth Emergency Management** Arrangements Audit Report No.45 1999-2000 Commonwealth Foreign Exchange Risk Management Practices Audit Report No.50 1999-2000 Management Audit Branch—follow-up Audit Report No.3 2000-2001 Environmental Management of Commonwealth Land—follow-up Audit Report No.8 2000-2001 Amphibious Transport Ship Project Audit Report No.11 2000-2001 Knowledge System Equipment Acquisition Projects in Defence Audit Report No.22 2000-2001 Fraud Control in Defence Audit Report No.26 2000-2001 **Defence Estate Facilities Operations** Audit Report No.32 2000-2001 **Defence** Cooperation Program Audit Report No.33 2000-2001 ADF Reserves Audit Report No.41 2000–2001 **Causes and Consequences of Personnel** Postings in the ADF Audit Report No.51 2000-2001 ADF Health Services follow-up audit
Audit Report No.16 2001–2002 Defence Reform Program -Management and Outcomes

Audit Report No.24 2001–2002 Status Reporting of Major Defence Equipment Acquisition Projects

Audit Report No.30 2001–2002 Test and Evaluation of Major Defence Equipment Acquisitions

Audit Report No. 38 2001–2002 Management of ADF Deployments to East Timor

Index

Α

Australian Institute of Petroleum 25, 44, 48, 66, 76, 89, 96 Australian Marine Oil Spills Centre 44 Australian National Audit Office automotive diesel oil AVCAT (F44) AVGAS (F18) 69, 94 AVTUR (F34/35) 69, 84, 94, 107 **B** bulk liquid distribution study 43, 68, 107

bunding 68, 81, 85, 86

С

Chief of the Defence Force 93

Commander Joint Logistics 30

contamination 57, 81, 83, 84, 86 Corporate Services and Infrastructure

Group 24, 30, 33, 44, 66

critical infrastructure project 38, 39, 40, 41, 102, 103, 104

D

Defence Fuels Group (United Kingdom Ministry of Defence) 47, 55, 62, 79

defence industry capability agenda 38, 91

Defence Materiel Organisation 22

Department of Industry, Tourism and Resources 15, 25, 90, 91, 96 diesel fuel rebate scheme 21, 51, 63 downstream petroleum products action agenda 89, 90, 94, 96 **E** emergency response plans 80

Environment Australia 25, 44, 82, 95, 96

environmental management 81, 82, 83, 85, 108

Environmental Protection and Biodiversity Conservation Act 1999 81

environmental reporting 39, 48, 54, 59, 62, 70, 78, 80, 81, 82, 84, 109

F

facility inspection 76, 78, 79 facility maintenance 74, 75, 78, 79 fuel exchange agreements 33, 64 *Fuel Quality Standards Act 2000* 94, 95 FUELSCAN 61

Н

Headquarters Australian Theatre 30, 34

J

Joint Fuels and Lubricants Agency 13, 16, 21, 22, 24, 30, 32, 33, 44, 47, 49, 50, 51, 52, 53, 55, 56, 65 Joint Logistics Command 13, 22, 24, 30, 31, 32, 35, 45, 49, 59, 69

L

Liquid Fuel Emergency Act 1984 92

Μ

Management Audit Branch 69, 102, 108

management information systems 14, 32, 33, 37, 61, 62, 64, 78, 84

Military Bulk Fuel Storage Maintenance Guideline 14, 17, 72, 73, 74, 75, 77, 80

Ν

National Oil Supplies Emergency Committee 15, 93, 96

national support agenda 39, 42, 48, 105

National Support Policy Branch 39, 40, 42, 48, 49, 105

naval distillate (F76) 54

0

oils and lubricants 11, 13, 21, 25, 55, 56

Ρ

- Policy, Guidance and Analysis Division 22, 38, 39, 105
- price forecasting 14, 17, 57, 59, 60, 61, 64, 65

price risk management 12, 13, 17, 51, 52, 56, 57, 58

S

- standing offers 14, 52, 53, 54, 55, 57, 58, 59, 60, 61, 64
- stockholding policy 11, 25, 70, 71
- storage facilities 14, 17, 25, 62, 66, 67, 68, 70, 71, 72, 73, 74, 76, 77, 81, 83, 107

Strategic Command Division 36, 41

Strategic Logistics Branch 16, 23, 24, 29, 30, 33, 36, 46, 47, 49, 50, 92

U

underground storage tanks 86

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