

A CRITICAL DEPENDENCE

**PROVIDING LOGISTICS
SUPPORT TO AIR OPERATIONS**

David Pasfield

THE AIR POWER STUDIES CENTRE

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National Library of Australia
Cataloguing-in-Publication entry

Pasfield, D. (David) 1954-.
Providing logistics support to air operations.

Includes index.
ISBN 0 642 24443 X.

1. Air warfare. 2. Logistics. I. Australia. Royal Australian Air Force. Air Power Studies Centre. II. Title. (Series: Fellowship paper (Australia. Royal Australian Air Force. Air Power Studies Centre); no 11).

355.411

ACKNOWLEDGMENTS

During the conduct of this study a number of people contributed their time and knowledge and made available to me a wide variety of written material and documentation. I express my gratitude to these people.

The staff of the Air Power Studies Centre provided an environment strongly conducive to effective research and displayed a ready willingness to assist me in the development of this study. In particular, I would like to acknowledge the advice and editing assistance provided by Dr John Mordike and Wing Commander Ric Casagrande throughout 1995. I am also grateful to Sandi Siegnarack and Sandra Di Guglielmo, who provided cheerful and regular computer and administrative help. Notwithstanding the assistance I have received, the views expressed in this study, unless otherwise attributed, are my own and I accept full responsibility for shortcomings and errors.

As well as the quite practical typing assistance in the latter stages of this study, when time constraints became more pressing, my wife Helen provided constant support and encouragement, as did our two children, Crystal and David. So, to my family, goes a special vote of thanks.

David Pasfield
Canberra
1996

ABSTRACT

This book was prepared at the Air Power Studies Centre as a Chief of the Air Staff Fellowship in 1995. The fellowship scheme commenced in 1990, and aims to develop awareness and foster understanding of air power in the Australian context. The aim of this fellowship was to contribute to the development of the philosophical basis for the provision of logistics support to air operations.

This study reviews how logistics constitutes part of the military capability of a nation and discusses its context, specifically in the air environment. The way logistics support is provided to military forces is being critically reviewed by nations around the world due to radical changes in strategic circumstances and limited financial resources. This study provides a manner of viewing logistics which emphasises its critical importance in the determination of the success or otherwise of military operations. In doing so it briefly reviews some recent overseas experiences in the provision of logistics support.

The guidance provided on air power logistics support requirements, in the form of doctrine, is critically reviewed and a revised doctrine is proposed. There are also recommendations made on the further development of logistics support concepts. A framework of logistics support concepts is proposed. This is intended to ensure that logistics support is organised as a single, coherent system that removes duplication and assists in the provision of a consistent, comprehensive and complementary flow of logistics support through each of the levels of war to enable the effective application of air power.

To perform these roles [as specified in strategic guidance] successfully, *the Australian Defence Force depends critically on our ability to support and sustain operations.* This requires a significant national effort and close cooperation between the Force's logistics resources and those of the community as a whole.

Defending Australia,
Defence White Paper 1994¹

¹ *Defending Australia - Defence White Paper 1994*, Australian Government Publishing Service, Canberra, 1994, p 31. The title of this book has been based on this statement from strategic guidance. Detail on the designated roles of the Australian Defence Force can be found in Chapter Two of this book.

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ACRONYMS AND ABBREVIATIONS

1OSU	No 1 Operational Support Unit
2LM	[USAF] Two Level Maintenance
AAP	Australian Air Publication
ABW	Air Base Wing
ACAUST	Air Commander Australia
ACLOG	Assistant Chief of the Defence Force for Logistics
ACPP	Air Command Preparedness Project
ADF	Australian Defence Force
ADFP	Australian Defence Force Publication
ADFWC	Australian Defence Force Warfare Centre
AFDD	[US] Air Force Doctrine Document
AFO	Air Force Office
AHQ	Air Headquarters
AJSP	Australian Joint Service Plan
ALC	[USAF] Air Logistics Center
ALG	Air Lift Group
ALT	Air Loading Team
AMX	[US] Air Mobility Express
AO	Area of Operations
APG	Administrative Planning Group
APM	Air Power Manual
APSC	Air Power Studies Centre
ATTU	Air Transportable Telecommunications Unit
AWC	Advisory War Council
BCP	Base Combatant Personnel
BDR	Battle Damage Repair
BPR	Bi-Annual Preparedness Report
C2	Command and Control
C3	Command, Control and Communications
C3I	Command, Control, Communications and Intelligence
CABW	Contingency Air Base Wing
CAS	Chief of the Air Staff
CASAC	Chief of the Air Staff Advisory Committee
CDF	Chief of the Defence Force
CDR	Closer Defence Relations [between Australia and New Zealand]
CIS	Communications and Information Systems
CJFA	Commander Joint Forces Australia
CMP	Contingency Maintenance Plan
CONUS	Continental United States
COSC	Chiefs of Staff Committee
CPD	Chief of the Defence Force Preparedness Directive
CRAF	[US] Civil Reserve Air Fleet
CSP	Commercial Support Program

D3	[USAF] Door-to-Door Distribution
DA 94	Defending Australia - Defence White Paper 1994
DACC	Defence Assistance to the Civil Community
DFACP	Defence Force Aid to the Civil Power
DGLOG-AF	Director General Logistics - Air Force
DI(AF)	Defence Instruction (Air Force)
DM	Deeper Maintenance
DNSDC	Defence National Storage and Distribution Centre
DSTO	Defence Science and Technology Organisation
FAK	Fly Away Kit
FAP	[RAF] Fly Away Pack
FE	Force Element
FEG	Force Element Group
FMC	Fully Mission Capable [aircrews]
FOB	Forward Operating Base
FPDA	Five Power Defence Arrangement
FY	Financial Year
FYDP	Five Year Defence Program
HNS	Host Nation Support
HQADF	Headquarters Australian Defence Force
HQLC	Headquarters Logistics Command
HQOSG	Headquarters Operational Support Group
HQTC	Headquarters Training Command
ILS	Integrated Logistics Support
INU	Inertial Navigation Unit
JC	Joint Commander
JFAO	Joint Force Area of Operations
JFC	Joint Force Commander
JODG	Joint Operational Doctrine Group
KKMC	King Khalid Military City [in Saudi Arabia]
LCAUST	Land Commander Australia
LIS	Logistics Information Systems
LJC	Lead Joint Commander
LOC	Line of Communication
LSPG	Logistics Strategic Planning Guide
MATU	Mobile Air Terminal Unit
MCAUST	Maritime Commander Australia
MDS	Minimum Deployment Stocks
MDSS	[RAF] Mobility and Deployed Support Study
MLOC	Minimum Level of Capability
MOA	Memorandum of Agreement
MOB	Main Operating Base
MOU	Memorandum of Understanding
MPG	Maritime Patrol Group
MSA	Main Support Area
NATO	North Atlantic Treaty Organisation
OC	Officer Commanding
OCOSW	Officer Commanding Operational Support Wing

OFF	Operational Facilities Flight
OLOC	Operational Level of Capability
OM	Operational Maintenance
ORBAT	Order of Battle
OSG	Operational Support Group
OSW	Operational Support Wing
OVP	Operational Viability Period
OVR	Operational Viability Resources
PEP	Priming Equipment Pack (RAF)
PLOC	Present Level of Capability
PMB	Program Management and Budgeting
POC	Period of Contingency
POE	Point of Entry
PXR	Post Exercise Report
RAAF	Royal Australian Air Force
RAF	Royal Air Force
RF (Air)	[UK] Reaction Forces (Air)
RI	Repairable Item
ROFE	Rates of Effort
SLSU	Second Level Support Units
SOP	Standard Operating Procedure
SP	Sustainability Period
SR	Sustainability Resources
SR 93	Strategic Review 1993
SRG	Strike Reconnaissance Group
SSLM	Single Service Logistics Management
STRATINT	Strategic Intelligence
TFG	Tactical Fighter Group
TYDP	Ten Year Defence Plan
UK	United Kingdom
UN	United Nations
US	United States
USAF	United States Air Force
USN	United States Navy
VSTOL	Vertical and Short Take-Off and Landing [aircraft]
WSLM	Weapon System Logistics Management
WWII	World War II

CHAPTER ONE

INTRODUCTION

The more I see of war, the more I realise how it all depends on administration and transportation (logistics)...It takes little skill or imagination to see where you would like your army to be and when; it takes much knowledge and hard work to know where you can place your forces and whether you can maintain them there. A real knowledge of supply and movement factors must be the basis of every leaders plan; only then can he know how and when to take risks with those factors, and battles are won only by taking risks.

General A.C.P. Wavel²

Australia's highest defence priority is to build, maintain and support forces for the nation's defence. This involves understanding the current strategic circumstances and guarding the air and sea approaches. This creates the requirement for capabilities that can deny these approaches to an adversary and defeat incursions onto Australian territory. The Australian Defence Force (ADF) must therefore be able to operate over an area that exceeds 10% of the earth's surface. Further, the ADF has been, and will continue to be, involved in activities that require military deployments to locations around the world.³

The vastness of the area in and to the north of Australia, combined with harsh climatic conditions, and poor communications and transport infrastructure places a large burden on the ability of the national support base to provide the requisite logistics to be able to commence and sustain military operations.

While any operations that will be conducted by the ADF will almost certainly be joint in nature, there remain differences in the way forces in the three environments, sea, land and air, will operate. This includes the provision of logistics support. Air base infrastructure and services are essential for air operations to be generated and sustained. This remains the case for air elements that

² Quoted in Rutenburg D.C. and Allen J.S. (ed) *The Logistics of Waging War, American Military Logistics 1774-1985, Emphasizing the Development of Airpower*, US Government Printing Office, Washington DC, 1985, p 116.

³ *Defending Australia - Defence White Paper 1994*, Australian Government Publishing Service, Canberra, 1994, pp 14-15, paras 3.6-3.11.

deploy, for whilst aircraft themselves are inherently deployable, the provision of their large and necessary supporting infrastructure requires more thoughtful planning. This dependence on air base infrastructure and support systems also creates a requirement to plan for anticipated enemy action against large, static assets and often predictable lines of communication.

Furthermore the high technology and complexity of modern air weapon systems greatly increases the difficulty and cost of the supply and maintenance functions. That is not to say of course that there should not be a joint approach to the provision of logistics support. Indeed the operational and economic arguments for doing so are compelling. However, there is need for a different emphasis when considering the logistics support requirements of forces operating in the three environments. This study focuses on the air environment.

Many logistics activities are performed to support the Air Force on a day-to-day basis and provide the wherewithal to conduct operations in the future. Some logistics activities however focus on the provision of logistics support for current or pending operations. This study refers to this latter classification of logistics as 'operations logistics' and the former as 'non-operations logistics'. More detailed definitions and justification for these classifications are provided in Chapter Five.

It is of course impossible to completely divorce the requirements for the provision of these two proposed classifications of logistics. There is heavy overlap between them and the distinction is not always easy to make. At present, however, there is not any widely accepted or endorsed distinction between them, and this study will argue that this has created some difficulties in clearly focussing on the support of operations. For example, the logistics considerations involved in acquiring a new capital equipment would be different from those for determining how to support an existing capital equipment. That is, we can build characteristics into a new equipment that will favourably alter the ongoing logistics support that it will require. A widely accepted definition for, and understanding of, those logistics activities that are required to directly support operations would provide a much stronger base on which to develop our support, and indeed to some extent operational, organisations and plans.

The importance of a sound, widely understood doctrine is accepted by most defence forces.⁴ The RAAF, in the second edition of *The Air Power Manual*, described its doctrine for logistics.⁵ This study

⁴ Doctrine is defined and explained in Chapter Seven.

⁵ RAAF DI(AF) AAP 1000, *The Air Power Manual* (2nd Ed), Air Power Studies Centre, RAAF Base Fairbairn, Canberra, 1994, Ch 10, pp 147-160.

reviews that doctrine and proposes several changes. Whilst the existing doctrine provides a good background to understanding logistics, it is argued that it has deficiencies in providing guidance to logisticians and commanders. The proposed doctrine in this study provides a set of logistics principles and a description of the desired characteristics of a logistics system designed to support air operations.

Following on from the perceived deficiency in doctrine is the absence within the RAAF of a full range of endorsed concepts of logistics support at each of the three levels of war.⁶ Although there has been a great deal of development work carried out on how to most effectively provide logistics support for air operations, the absence of these overarching concepts has prevented a consistent and coordinated approach being taken. This deficiency has been officially recognised and at present logistics support concepts are being developed. This study argues that this work on the development of logistics support concepts must be coordinated. There must be an evident flow of the logistics support requirements for operations from the strategic through to the tactical level. It is not that different functions have to be performed at each level, but rather a different emphasis and focus is required. It is argued that while maintaining this consistency, clearly defined lines of responsibility must be established to avoid over intrusion between the levels.

This study will define what type of logistics is required to support specific operations, ie 'operations logistics' and enunciate a broad philosophy for the provision of operations logistics support for air operations. The study can effectively be divided into three parts. The first part provides the necessary background for later discussion. Strategic guidance provided to the ADF and the concept of preparedness⁷ are described in Chapters Two and Three respectively.

Whilst the first part of the study provides the background for subsequent discussion, the second part provides the base. Chapter Four discusses logistics in the context of the provision of air power in Australia and Chapter Five is a discussion on how logistics should be approached. Many sections in these two Chapters will be familiar to some military readers. However, an understanding of the study's argued basis for viewing the role of logistics and the division of various logistics functions into operations and non-operations categories is important as a prelude to further discussion in the study.

⁶ The three levels of war are strategic, operational and tactical. Chapter Ten discusses the activities and logistics responsibilities at each of these levels.

⁷ Preparedness involves first, the readiness of military forces to engage in operations and second, the ability of those forces to sustain operations. The concept of preparedness is central to the provision of logistics support and for that reason is described in more detail in Chapter Three.

Too often logistics is seen as being that which is required to support military capability. This is wrong. Logistics is an essential and *integral* component of military capability. This is much more than an argument in semantics or definitions. To have inadequate and poorly planned logistics support is to have inadequate and poorly planned military capability. Organisational structures and contingency plans that do not recognise the context of logistics place the outcomes of future operations in peril. Chapters Four and Five provide a suggested way for the viewing of logistics in the provision of air power. Chapter Six provides a brief overview of some recent overseas experiences in the provision of logistics support.

The third part of the study looks at logistics doctrine and the development and structure of logistics support concepts. Logistics doctrine is covered in two Chapters. Chapter Seven reviews current doctrine, assesses its weaknesses and examines what aspects should be covered. Chapter Eight spells out a proposed logistics doctrine for the Air Force. Chapters Nine and Ten examine logistics support concepts for air operations. The former discusses the current status of these concepts whilst the latter proposes a framework of concepts which will enhance the development of a comprehensive, complementary and consistent approach to the provision of logistics support from the strategic level of war through to the tactical level.

Chapter Eleven provides a summary and outlines the recommendations made throughout the study.

CHAPTER TWO

STRATEGIC GUIDANCE

The new strategic arguments facing Australia are more sophisticated than worrying about unlikely military invasion. They are to do with our national security and independence in a fundamentally competitive, self-help world and in an Asia where the great Asian powers will fundamentally determine the security outlook. The problem is Asia has no history of conducting successfully a multi-polar balance of power and no experience at all of forming a comprehensive regional security community.

*Paul Dibb*⁸

INTRODUCTION

This study describes a basis for a philosophy for the provision of logistics support to air operations. This philosophy needs to commence at the highest level in order to provide the requisite guidance to those involved in the planning for and provision of logistics at all levels. Fundamental to the development of such a philosophy is a clear understanding of strategic guidance and how it impacts on the logistics support of operations. This Chapter briefly reviews current strategic guidance and examines aspects which are most relevant to the development of logistics doctrine and concepts.

There are two primary documents, which together provide the strategic guidance from the Australian Government to the Defence organisation. *Strategic Review 1993 (SR 93)*⁹ provides higher level strategic guidance for a relatively short time frame of 3-5 years. *Defending Australia - Defence White Paper 1994 (DA 94)*¹⁰, looks ahead for 15 years and provides guidance for military capability development in the longer term.

⁸ Dibb P., 'Defence Must Look Forward', *The Australian*, 16 December 1994, p 13. Professor Paul Dibb is head of the Strategic and Defence Studies Centre at the Australian National University. He was an advisor to the 1994 Defence White Paper team.

⁹ *Strategic Review 1993*, Director of Publications, Defence Centre, Department of Defence, Canberra, 1993.

¹⁰ *Defending Australia - Defence White Paper 1994*.

From this broad government guidance *the Defence Logistics Strategic Planning Guide* (LSPG)¹¹ has been developed. This document provides strategic direction for logistics planning in the Australian Defence Force (ADF).

THE STRATEGIC ENVIRONMENT

Defence Policy

When releasing *Defending Australia - Defence White Paper 1994*, Senator Robert Ray, the Minister for Defence, stated:

The key judgment in this White Paper is that fundamental changes in strategic affairs, both globally and within our region, will make Australia's strategic environment more demanding over the next fifteen years.¹²

The end of the Cold War, and the consequent reduction in the likelihood of global war is a welcome development. Yet the future is now much less predictable. Events since the collapse of the Soviet Union indicate that the lifting of Cold War restraints has resulted in some instances of instability and military action. Many nations, including those in Australia's region, have growing economies which provide the means to procure modern military equipment. Many of the countries within Australia's region are also experiencing a growing technological base which will aid their capability to support these sophisticated weapons systems.

These developments have not resulted in a direct threat to Australia nor, necessarily, to a more unstable region. What it does mean is that we must now plan in a strategic environment that is more complex and less certain.

Defence policy cannot be developed in isolation. The Australian Government sees the requirement to develop our defence, foreign, trade, immigration and other international policies, as well as domestic policies on economic, industrial, social and environmental issues in an integrated manner. This will assist the Government in achieving one of its major objectives of establishing Australia's place in the new patterns of relationships that are emerging as a result of global and regional changes. The Defence contribution to this integrated national effort is in ensuring that the nation is able to

¹¹ *Defence Logistics Strategic Planning Guide*, (3rd Ed), Directorate of Publishing, Department of Defence, Canberra, 1995.

¹² Ministerial Statement by the Minister for Defence Senator Robert Ray, 30 November 94.

defend itself from armed attack, including sustaining its alliances and contributing to a global and regional environment in which attack on Australia is less likely.

Self-reliance remains the foundation of Australia's defence policy. This requires the maintenance of military capabilities to defend Australia, without depending on the combat forces of other countries. The security of Australia is not sufficiently vital to other nations that there can be an expectation that they will commit substantial forces to its defence.

The building, maintenance and support of forces for the defence of Australia is the nation's highest priority and the capabilities that are developed must reflect this priority. The White Paper asserts that the approach to the defence of Australia emphasises understanding the strategic environment and guarding the air and sea approaches. This involves capabilities that can deny these approaches to an adversary and defeat incursions on Australian territory. The guidance further states that the support for ADF forces should come from Australia's own resources as far as is practicable.¹³ This is consistent with Australia's policy of self-reliance.

Although the defence of Australia is the primary determinant of the defence capabilities that are needed, consideration is given to the requirement for the ADF to undertake operations and activities at locations around the world. Over the last few years there has been ADF involvement in several locations, including the Persian Gulf, Namibia, Cambodia, Somalia, Rwanda, and the South Pacific. This makes the attribute of flexibility in ADF capabilities even more important.

Determining Capabilities

Australia is not experiencing diplomatic tensions with any country that could lead to a military attack, nor are there any reasons to believe that such a situation is likely to develop. The White Paper recognises, however, that a country's motives and intentions can change more rapidly than military capabilities can be built up.¹⁴ For that reason Australia's defence planning focuses on capabilities and not threats. Australia, therefore, recognises a requirement to be able to defeat those capabilities which could be employed in either the air and sea approaches, or on Australian territory.

¹³ *Defending Australia - Defence White Paper 1994*, p 15, paras 3.7-3.11.

¹⁴ *ibid*, p 23, para 4.7.

Strategic guidance identifies two broad levels of threat which are considered when discussing what capabilities should be possessed.¹⁵ In terms of major conflict Australia does not see the requirement to maintain the capacity to counter a major attack on the continent. No regional country currently possesses, nor appears to be planning to develop, the extensive capability that would be necessary to lodge and support forces on the continent and defeat the ADF. It is considered sufficient to maintain the ability to adapt and expand current forces for major conflict should the need arise as no country could develop the capability required for so large an undertaking without Australia being able to detect such preparations. Short warning conflict, however, does place greater demands on short term planning.

Short warning conflicts are those which could credibly occur with the range of capabilities that either exist in the region or may emerge over the next few years. Obviously, Australia must possess capabilities to deal with such conflicts which could occur with relatively short notice. The scale and intensity of these types of conflict could range from small raids to larger and protracted operations.

Although the number and scale of engagements in short warning conflict would be less than in major conflict, the use of all existing capabilities is possible. Therefore, these smaller scale conflicts may still see the employment of high technology weapon systems. Improvements have seen greater accuracy and lethality available in weapon systems along with an increase in the range at which engagements can occur.

These factors mean Australia has to exploit the qualities of stealth, deception and self defence capabilities, particularly of key assets. The importance of air defence capabilities continues to grow. Effective command and control of force elements and layers of defensive systems will be necessary for survivability. The need for accurate and timely information is greater to improve the security of forces, and for the coordination and application of assets.

Whilst not figuring prominently, two aspects of the concept of deterrence do appear in Australia's defence posture. First, an adversary may mount a series of lower level raids and other harassing actions due to the deterrence effect of Australia's capacity to respond to larger attacks. Second, the White Paper states that in circumstances where an adversary was conducting harassing attacks

¹⁵ *ibid*, p 23, paras 4.8-4.16.

Australia would consider the option of escalation, which includes the possibility of strategic strike.¹⁶

Depth in Defence

Of particular importance to this study is Australia's posture of depth in defence. This depth is achieved by:

- **Use of Geography.** Australia can develop its capabilities to take advantage of its geography by using the vast distances that an adversary would have to cross to provide early warning and to make the air and sea approaches an area for initial engagements. This involves giving a clear priority to air and naval capabilities that can deny the air and sea approaches to an adversary. The very large inhospitable areas in the north of Australia can also be advantageously employed if the ability is developed that will enable the ADF to operate in this harsh environment.
- **Exploitation of Technology.** Australia's employment of modern defence technology in surveillance makes the detection of major platforms and force concentrations in the air and sea approaches easier. Any attempted intrusion by an adversary can be made a costly activity for them. Australia's land forces can also exploit new technologies in surveillance, mobility and firepower. Whilst the ADF will continue to exploit the advantages that technology can provide, it is apparent that the technological edge that Australia has enjoyed within the region is diminishing. The economic growth and technological development of other countries within the region means that Australia will have to become more selective in the areas where a clear lead is to be maintained.
- **Knowledge of the Region.** Australia's knowledge of the region will assist in providing an awareness of the development of more significant military capabilities, and of the development of hostile motives and intentions.
- **Wide National Support Base.** Australia is able to draw on a wide range of national resources for its defence. The ADF is able to prepare and sustain its forces by collaboration with Australian industry to supply, repair

¹⁶ *ibid*, p 24, para 4.12.

and modify equipment and to provide through-life support; utilise the national transport and telecommunications infrastructure; cooperate with other government agencies and organisations such as Coastwatch; and work with the people of northern Australia to increase knowledge of hostile movements.

Roles of the Australian Defence Force

To enable this posture of defence in depth to be achieved the Government has identified the following key roles for the ADF¹⁷:

- Command, control and communications.
- Intelligence collection and evaluation.
- Surveillance of maritime areas and northern Australia.
- Maritime patrol and response.
- Protection of shipping, and offshore territories and resources.
- Air defence in maritime areas and northern approaches.
- Defeat of incursions on Australian territory.
- Protection of important civil and defence assets, including infrastructure and population centres.
- Strategic strike.

The ability to provide effective support to operations will be one of the prime determinants of the ADF's capacity to successfully perform its designated roles. This support will involve the resources of the ADF, other government and civilian organisations, Australian industry, and the Australian people in a national effort. Additionally, support will always be required from overseas, whether it be from overseas governments, government agencies or private industry. This reflects the fact the current defence policy is one of self reliance and not self sufficiency.¹⁸

¹⁷ *ibid*, p 30, para 4.35.

¹⁸ For a discussion of the challenges facing Australia in satisfying the policy of self reliance refer to Tramoundanis D., *Defence Self-Reliance and the Sustainment of Operations*, Working Paper P12, Air Power Studies Centre, RAAF Base Fairbairn, Canberra, 1993.

The degree of dependence on particular sources of support, and the manner in which support will be provided, will vary markedly depending on the type of exercise, operation or activity being supported. Clear guidance on the provision of this support is fundamental to Australia's capacity to conduct operations in a timely and effective manner. This study provides detailed discussion on the provision of this guidance.

Primary Support Roles¹⁹

To operate effectively, the ADF needs support capabilities attuned both to the likely nature of conflict in Australia's strategic environment and to the capacity of the national and civil infrastructure to contribute to the national defence effort. The primary support roles relate to the provision of:

- Command, control and communications (C3).²⁰
- Training.
- Logistics support.
- Transport.
- Infrastructure.
- Industry support.

Other Defence Roles²¹

Apart from the defence of Australia, the ADF must be able to undertake a number of other important roles. Whilst these additional roles do not determine the ADF's overall force structure, they can influence training requirements and the acquisition of materiel for specific missions. The ADF does not develop capabilities for transnational issues that are primarily the responsibility of other government agencies. In such areas the ADF would support, rather than supplant, civil authorities.

¹⁹ *Strategic Review 1993*, p 46, para 5.33.

²⁰ 'Command, control and communications' (C3) appears in the list of defence of Australia roles quoted from DA 94 as well as the primary support roles quoted from SR 93. This results from DA 94 being released later than SR 93 and C3 being considered in a different manner in the intervening period. The SR 93 support roles have been quoted here because of the importance they will have in the development of an ADF support concept. This is discussed in Chapter Nine.

²¹ *Strategic Review 1993*, p 46, paras 5.34 - 5.36.

The types of roles involved include:

- Natural disaster relief.
- Assistance to the civil community.²²
- Aid to the civil power.²³
- Peace operations.
- Provision of assistance and responding to crises in the nearer region.
- Other activities in support of regional security.

Regional Engagement

Stability within the region, and hence Australia's security, can be enhanced through a policy of regional engagement involving dialogue on the range of strategic and defence issues that concern countries in the region. There are also activities aimed at mutually improving military capabilities on a bilateral basis. Transparency in defence policy development and planning is also a goal of this policy by ensuring that countries of the region understand each other's security concerns, perceptions and capabilities.

Alliances

The long standing alliance relationship between Australia and the United States (US) remains a key element of defence policy, although the end of the Cold War has made it more complex. The requirement for the US led Western Alliance to maintain a strategic balance with the Soviet Union no longer exists, however benefits in maintaining the alliance still exist for both parties. The US benefits from the alliance through Australia's close engagements in the region

²²Defence Assistance to the Civil Community (DACC) is the provision of defence resources for the performance of tasks which are primarily the responsibility of the civil community. DACC is only applicable if there is no likelihood that Defence personnel will be required to use force.

²³ In Australia, law enforcement is the shared responsibility of the Commonwealth and State/Territory law enforcement authorities. Situations may arise where the relevant law enforcement authority lacks the necessary resources or capabilities and requests assistance from the ADF. Where such assistance could involve the use of force by ADF personnel, the assistance is referred to as Defence Force Aid to the Civil Power (DFACP).

and our support for most US values and interests. The alliance also supports US strategic presence in the region. The United States Navy (USN) and United States Air Force (USAF) make use of logistics support and staging facilities in Australia. The benefits to Australia, some of which are mutually beneficial, are in the areas of access to high technology, intelligence, defence science and technology, training, and logistics support.

Australia has long shared a strong alliance with New Zealand. Both countries value the support they could receive from each other in a conflict and this is reflected in the respective defence policies of each country. Greater interoperability and mutual support activities between the two forces will continue to develop as a result of Closer Defence Relations (CDR). CDR has operated since 1991 resulting in closer consultation on defence planning and management issues. The current dispute between New Zealand and the US over ship visits has not prevented Australia from further developing defence relationships with either nation, however, resolution of the problem would open further opportunities for cooperation with New Zealand.

Other International Defence Relationships

Beyond the defence relationships that exist within the region and alliances are those related to historical ties and defence industry links. Included amongst these is the relationship with the United Kingdom, with whom Australia shares strong historical ties, as well as being involved in training and exercise activity, intelligence and defence science cooperation, mutual involvement in the Five Power Defence Arrangements (FPDA) and mutual logistics support arrangements. Other links exist with Canada, France, Germany, Italy, the Netherlands and Sweden. Of particular note is that the focus for development of defence links with countries outside our region will be in the areas of logistics support, defence science and materiel collaboration.

Global Security

Defence contributes to a national effort for the United Nations (UN) and other multilateral activities. Australia has been a regular participant in activities aimed at resisting aggression, limiting the proliferation of weapons, assisting in humanitarian efforts and restoring order and stability. Support for such endeavours will continue.

National Defence Support Base

The operational effectiveness of the ADF is dependent upon effective support and a vital element in this support is the capacity of industry. Current agreements and government policy mean that Australian and New Zealand industry are treated equally in all respects, with the exception of a small number of high security or third country collaborative projects. This means that Australian and New Zealand industry form a single defence industrial base.

Priority is given to the ability to provide defence system repair, maintenance and modification capabilities within local industry. The local provision of technologies associated with communications, software, sensors and electronic warfare are particularly important.

Australia maintains and continues to develop a research and development base for science and technology that is relevant to the environment and evolving military capabilities. This support is provided both through the Defence Science and Technology Organisation (DSTO) and other industrial and science organisations.

The support of the wider Australian community is also of prime importance. ADF personnel are recruited from the Australian community and in time of conflict the total support of the community is essential.

STRATEGIC LOGISTICS GUIDANCE

Background

Strategic direction for logistics development in defence is provided by the *Defence Logistics Strategic Planning Guide*. The first two issues of the LSPG were released in 1990 and 1991 respectively. The third issue was released in 1995 and incorporates the strategic guidance provided in *Strategic Review 1993* and the *Defending*

Australia - Defence White Paper 1994. The LSPG is sponsored by Assistant Chief of the Defence Force for Logistics (ACLOG) and is endorsed by Chief of the Defence Force (CDF) and the Secretary for Defence.

To ensure the effective application of logistics resources in the support of the ADF careful planning is required. The LSPG provides planning guidelines intended to be employed Defence-wide in order to:

- Provide the vision for logistics in Defence.
- Describe the planning environment, identifying factors which influence the way the logistics vision will be achieved.
- Identify the essential elements which lead to fulfilment of the vision.
- Establish Defence-wide logistics development guidance for Program Managers.
- Provide a framework for logistics planning and development in the Services, and for studies and reviews in specific areas.²⁴

Vision for Logistics

The LSPG has identified the following vision for logistics in Defence:

To provide the most effective and efficient logistic capability to enable the ADF to carry out its endorsed roles and tasks.

Principles for Logistics Strategic Planning

The LSPG has identified four principles which serve as the foundation for a set of specified goals and strategies to achieve the vision:

- **Principle I - Focus logistics support on military capability**

²⁴ *Defence Logistics Strategic Planning Guide*, p 3.

The first principle addresses the establishment of logistics as an integral element of force structure development and the subsequent maintenance of logistics capability to support preparedness objectives. It encompasses the weapons systems approach to logistics management, the clear definition of logistics resources for readiness and sustainability objectives, and the development of logistics support concepts for operations.

- **Principle II - Promote Logistic Self-Reliance.**

Principle II addresses the logistics infrastructure appropriate to supporting the defence of Australia. It covers the military, industrial and civil infrastructure, emphasising the need for Defence to make the maximum use of non-military resources. This principle also addresses the need to facilitate Australian industry support for the ADF through greater involvement by the Services in identifying opportunities for logistics support roles that can be performed by Australian industry.

- **Principle III - Streamline Logistics Support.**

This principle emphasises the importance of improving response times and reducing the cost of logistics support. It includes the need to critically examine and improve existing logistics policies, systems and practices, the pursuit of greater integration and rationalisation of logistics arrangements and facilities, and the introduction of performance measures for logistic costs and responsiveness.

- **Principle IV - Foster International Logistic Cooperation**

Principle IV concerns the relationships with countries from which logistic support is obtained, the treaty and alliance obligations, and the logistic implications of the defence involvement in the Asia-Pacific region.

CONCLUSION

The defence of Australia is the Government's highest security priority. This will rely on a policy of self reliance and depth in defence. Depth involves the use of geography, the exploitation of technology, knowledge of the region and full utilisation of the national support base.

Australia's security is closely tied to that of the region and more emphasis has been, and will continue to be, placed on fostering regional stability and security through bilateral and multilateral arrangements. Value is also placed on traditional alliances and new links forged with countries outside the region, primarily related to logistics support, defence science and materiel collaboration. Global security concerns remain important and Australia remains committed to United Nations peace operations and arms control regimes.

Within this broad framework of government strategic guidance Defence has established a strategic direction for Defence-wide logistics planning guidance in the form of the *Defence Logistics Strategic Planning Guide*.

CHAPTER THREE

PREPAREDNESS

It is a doctrine of war not to assume that the enemy will not come, but rather to rely on one's readiness to meet him.

*Sun Tzu*²⁵

INTRODUCTION

Logistics is all about the provision of preparedness. For air forces, it enables the creation and sustainment of air operations. Hence, it is essential that the concept of preparedness be understood before discussing the manner in which logistics may be best organised and planned to support air operations. This Chapter discusses preparedness and the way it is viewed within the Australian Defence Force (ADF).²⁶

Preparedness is one of the doctrinal imperatives of the RAAF. Current Australian air power doctrine states that the RAAF must maintain a high level of preparedness, commensurate with available resources, in order to respond effectively to credible air threats and be ready for the unexpected.²⁷ In his report on doctrinal lessons for Australia from the Gulf War, Group Captain Gary Waters expressed the dependence of preparedness on logistics when he stated that the preparedness of forces for combat rests largely on logistics and infrastructure.²⁸ As a concluding observation Group Captain Gary Waters stated:

²⁵ Quoted in Westenhoff C. M., *Military Air Power - The Cadre of Air Power Opinions and Thought*, Air University Press, Maxwell Air Force Base, Alabama, 1990, p 75.

²⁶ The prime official publication dealing with preparedness is ADFP 4, *Mobilisation Planning*, Director Publishing, Department of Defence, Defence Centre, Canberra, 1995, upon which much of this Chapter has been based, and from where all preparedness definitions have been taken.

²⁷ *The Air Power Manual*, (2nd Ed), p 67. Australian air power doctrine provides a list of imperatives which are considered to be of particular importance to the RAAF. The full list of these imperatives is: command, qualitative edge, attrition management, centre of gravity, timing and preparedness.

²⁸ Waters G., *Gulf Lesson One - The Value of Air Power: Doctrinal Lessons for Australia*, Air Power Studies Centre, RAAF Base Fairbairn, Canberra, 1992, p 237.

Preparedness through readiness (operational training levels) and sustainability (stockpiling, rapid acquisition and distribution systems) was essential before the allies could adopt a war footing.²⁹

In this Chapter the military capability of the ADF is divided into components to show how preparedness contributes to the ADF's ability to meet Government strategic guidance. Chapter Four of this study will discuss how all of the various elements of a nation's war making potential should be harnessed to achieve the most effective employment of military capacity. Financial guidance does, of course, also greatly influence the way the ADF satisfies strategic guidance and this aspect is also discussed.

PREPAREDNESS IN CONTEXT

Preparedness planning in the ADF is based on Government strategic guidance, as outlined in Chapter Two. Current Government guidance states that Australia has a policy of defence self-reliance within a framework of alliances and agreements. Therefore, there is a requirement for the ADF to maintain an independent military capability to conduct operations in the defence of Australia. Furthermore, strategic guidance has determined that the ADF is structured to:

- Deal effectively with short warning contingencies.
- Undertake current and foreseeable peacetime operational tasks as directed by Government.
- Provide a suitable basis for timely force expansion should Australia's strategic circumstances deteriorate.

Military capability, as shown in Figure 3-1, enables a nation to exercise military power. Force structure refers to the size, organisation, and technical and operational characteristics of the force-in-being. Force structure can be conveniently broken down into three components, personnel, equipment and facilities.

Preparedness represents the sum of readiness and sustainability. Readiness refers to the ability of designated forces to be committed to conduct specified operational roles and tasks within a nominated time. Sustainability refers to the ability to support these forces until the completion of their designated tasks.

²⁹ *ibid*, p 297.

Preparedness levels (explained in detail later in this Chapter) relate to the force structure as it is at a given time. That is, although the force structure may be expanded or contracted over time, it is considered to be a constant when assessing preparedness.

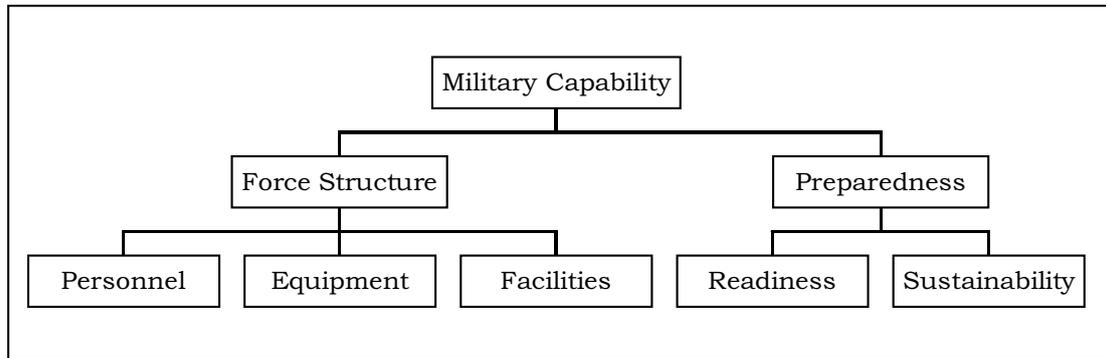


Figure 3-1: **The Components of Military Capability**

THE CONCEPT OF PREPAREDNESS

Background

The concept of preparedness, which includes consideration of levels of capability, timings and resource aspects, is represented at Figure 3-2.

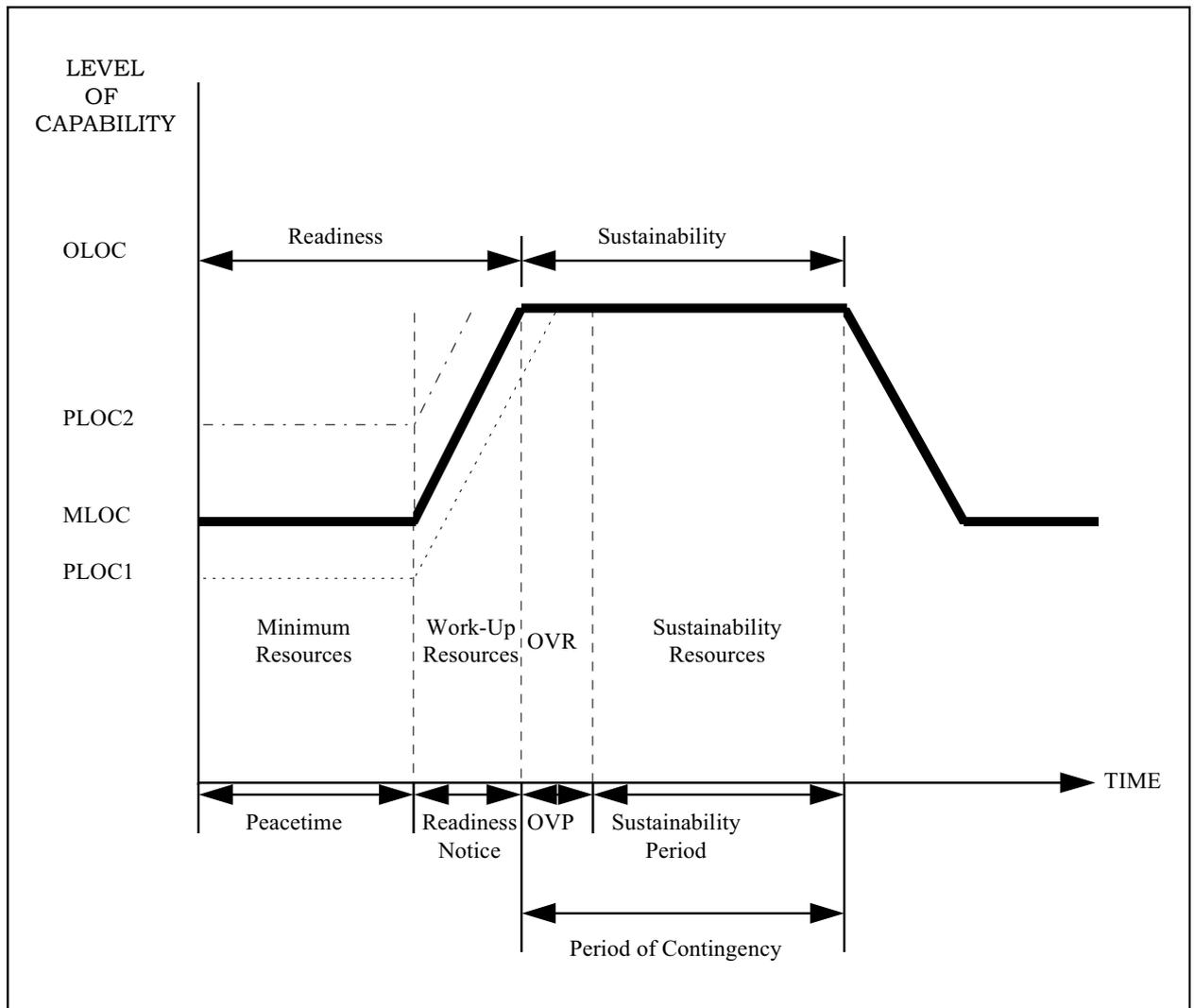


Figure 3-2: **The Concept of Preparedness**

Levels of Capability

As discussed previously, military capability consists of force structure and preparedness. When referring to specific force elements³⁰, three discrete levels of capability are used as measures:

- **Operational Level of Capability (OLOC).** OLOC is that level of capability at which forces have the necessary resources and are sufficiently trained to conduct specified operational roles and tasks. For planning purposes, a force element at OLOC must

³⁰ A force element is an ADF unit, part of a unit or association of units having common prime objectives and activities.

satisfy the following criteria:

- * The OLOC personnel entitlement has been filled with personnel who are deployable, having completed their individual training.
 - * The OLOC equipment entitlement is available and fit for use on operations.
 - * All collective training has been completed to operational proficiency standards.
 - * Sustainability resources, as defined later in this Chapter, are available.
- **Minimum Level of Capability (MLOC).** MLOC is the minimum level from which a force element can achieve its OLOC within assigned readiness notice (readiness notice is explained later in this Chapter). To be at MLOC, a force element must satisfy the following criteria:
 - * The personnel allocated against designated MLOC personnel levels are fit and trained to a standard which enables work-up training to commence (The concept of work-up is explained later in this Chapter).
 - * The MLOC equipment entitlement is available and fit for use during work-up training.
 - * Collective training, other than work-up training, has been completed to levels and standards sufficient to enable work-up training to be completed within the period specified in readiness notice.
 - * The resources to conduct work-up training are available, or can be procured in sufficient time to meet work-up training requirements.
 - **Present Level of Capability (PLOC).** PLOC is the level of capability of a unit or force element at any given time. PLOC will vary depending on the availability of personnel, equipment and training resources, and the levels and standards of training achieved. Therefore, in practice, PLOC will fluctuate. The capacity to measure and monitor PLOC is necessary to ensure that planning staffs are able to determine the status of forces in relation to their capacity to be committed to operations.

At Figure 3-2, a unit that is below MLOC is indicated by PLOC1. As shown, this unit will be unable to achieve OLOC within the period specified (ie. readiness notice). PLOC2 indicates a unit that exceeds MLOC. This unit is able to achieve OLOC in less than the required readiness notice. Whilst this may initially seem to be an acceptable situation, it probably means that the unit is consuming more resources than is necessary.

Timings

Various measures of time will influence the ability to prepare forces for operations in a number of ways. A balance must be maintained for all units between the provision of personnel, equipment, training resources and the available time. The different sets of timings relevant to preparedness in the ADF are:

- **Warning.** Warning is an assessment of the time that would most likely be available before a potential enemy with hostile intent could practicably undertake specified military action. Warning time varies for different levels and types of hostile military action, and, therefore, the time available for response also varies.
- **Readiness Notice.** Readiness notice is the specified time in which a force element must be capable of being ready to conduct specified operational roles and tasks. Readiness notice provides a means for the determination of resource allocation. Force elements with shorter readiness notice will obviously have a higher priority for resources than those with longer readiness notice.
- **Readiness Leadtime.** Readiness leadtime is the period of time required by a designated force element to reach its OLOC.
- **Operational Viability Period (OVP).** The OVP is the period of time that a force element must be capable of conducting operations without external support. On initially deploying, the force element cannot expect immediate external logistics support. Accordingly, they must be largely self-sufficient for a period of time during which an appropriate supporting logistics framework is established. For a force element to be considered able to satisfy its readiness requirements, it must be able to

operate at OLOC for the duration of the OVP without external support.

- **Sustainability Period (SP).** The SP is the period of time beyond the OVP that the force element must be able to maintain its OLOC.
- **Period of Contingency (POC).** The POC is the total period of time that a force element must be able to maintain its OLOC. The POC is the sum of the OVP and the SP.

Resource Categories

The resources that a force element will consume will vary between the different levels of capability. The period where a unit moves from one level of capability to another will also have different resource demands. There are four resource categories relevant to preparedness planning. The first three of these are related to readiness requirements and the fourth relates to sustainability:

- **Minimum Resources.** Minimum resources are those required to maintain force elements at MLOC.
- **Work-Up Resources.** Work-up resources are those required to raise, within readiness notice, the capabilities of force elements to a level which would permit their deployment on, or commitment to, operations. That is, work-up resources are those required to move force elements from PLOC to OLOC.
- **Operational Viability Resources (OVR).** OVR are those resources required to enable forces to conduct operations for a specified period after deployment or commitment to operations without external logistics support. That is, they are the resources required to support the force element during the operational viability period. Although OVR would be consumed during the sustainability period, they are considered to be a readiness requirement. This is because they must be available to the force element before that force element is considered ready for commitment to operations.
- **Sustainability Resources (SR).** SR are those resources which enable a deployed or committed force element to sustain operations after depletion of OVR. Sustainability considerations are a key factor in the determination of

stockholding and personnel policy. Sustainability requires plans to be in place for defence related industry, civil infrastructure and overseas supply agencies to meet the increased resource demands of operations. Recruiting and training systems to provide replacement and reinforcement personnel are also an element of sustainability planning.

Resource Allocation Priorities

Priorities for resource allocation are based essentially on consideration of readiness notice. Allocation of priority is achieved by the identification of broad readiness notice bands. Figure 3-3 reflects the priorities for resource allocation according to the degree of readiness notice.

The highest priority is given to those units with short readiness notice (ie. they have the least time to achieve OLOC). The next priority is given to the balance of the force-in-being in order for them to maintain their MLOC. The lower priorities are given to work-up and sustainability resources for force elements with longer readiness notice.

READINESS NOTICE	RESOURCE CATEGORIES		
	MINIMUM	WORKUP	SUSTAINABILITY
SHORT	Priority 1	Priority 1	Priority 1
MEDIUM	Priority 2	Priority 3	Priority 3
LONG	Priority 2	Priority 4	Priority 4

Figure 3-3: **Resource Allocation Priorities**

Stockholding

Stocks need to be held at levels appropriate to meet preparedness objectives:

- Stocks forming part of minimum resources should be held at optimum levels.
- Reserve stocks for operations need to be held only if they cannot be obtained in a timely manner by procurement initiated within the period designated as readiness notice.
- Reserve stocks for use during work-up training will also need to be held to the extent that they are not available for delivery prior to planned usage.

Current ADF stockholding policy differentiates between operating and reserve stocks on the basis of their purpose.³¹ Operating stocks are those which are used to maintain MLOC whilst reserve stocks are held to cover the requirements for workup, operational viability and sustainability. Therefore, it is not expected that reserve stocks would be consumed in peacetime.

The continuing availability of operating stocks from the peacetime supply pipeline also needs to be considered. Reserve stocks are needed to provide only the increased demand over and above normal peacetime levels and not the total expected usage during contingencies.

In planning stockholding levels there are several areas that need to be considered:

- International logistics support agreements that are in place, including the extent to which these agreements may be relied upon.
- The capacity and expansion capability of local industry.
- The pre-positioning requirements of the force.
- Critical items or items that entail long lead times will require special consideration during planning.

The requirements for reserve stock levels should be based on endorsed activity levels and usage rates expected in the work-up to OLOC, at OLOC and during the period of contingency. Additionally, assessment of the duration and geographical spread over which operations are expected to extend is important. It is also necessary to

³¹ *ADF Reserve Stockholding Policy and Implementation Guide*, Logistics Strategic Planning Section, Defence Logistics Division, 1993.

make assessments on where, when and which elements of the logistics system must be in place to support operations.

Activity Levels and Usage Rates

Activity levels refer to the nature and tempo (ie. the rate of activity) at which operations take place. The activity levels of support activities must also be considered. For example, force elements involved in tasks such as replacement pilot training, and support organisations such as supply or maintenance facilities, consume resources at a higher rate during periods of contingency.

Usage rates are the levels of consumption of resources for defined activity levels over time. Activity levels, appropriate to the levels of conflict described in strategic guidance, are used to calculate resource usage rates. The activity levels applicable to peacetime tasks and operations associated with contingencies which are possible in the shorter term are the first priority.

The associated levels of activity to maintain MLOC of the force-in-being, for work-up, maintenance of OLOC and for sustainability, are all used to determine the associated usage rates. Activity levels and usage rates for higher levels of conflict are required, but at a lower priority, to enable stockholding policy for the total requirements of preparedness to be developed.

To be useable in stockholding calculations, usage rates need to be appropriate for the nature of the forces to be committed and the duration of operations. Force structure planning provides guidance on the first of these factors and the second requires judgment decisions based on strategic guidance to enable the development of required stockholding plans. The operational viability period and sustainability period result from this judgment.

In practice, the accurate calculation of activity levels and usage rates is a difficult task. The only level of capability for which activity levels can be readily determined is MLOC, which is the peacetime level. Peacetime activity levels for the Air Force are generally expressed in terms of the number of flying hours to be flown in a certain period of time, ie. Rates of Effort (ROFE). There is greater difficulty in determining the activity levels for OLOC, due to the infrequency of contingencies and the wide variation between different possible contingencies. The calculation of this information is therefore dependent on a combination of historical data, objective assessment and professional judgment. The Air Force is currently well advanced on a project, referred to as the Air Command Preparedness Project

(ACPP), which is a lengthy and classified document which attempts to assess this data in a detailed manner.

Financial Considerations

Defence planning involves the identification of resource implications and funding arrangements necessary to support a contingency. The essential elements of this process are cost estimation and priority allocation, control of financial allocations, and capturing the actual cost of activities. The Defence financial system is based on the Five Year Defence Program (FYDP) which is the approved Defence Financial Program, while the Ten Year Defence Plan (TYDP) is a long term planning document in broad outline.

Defence planning requires each program³² to estimate and control the allocation of funds required to meet preparedness objectives. These estimates form the basis of the FYDP.

ADF PREPAREDNESS POLICY

Preparedness Objectives

Preparedness doctrine within the ADF, which has been broadly explained in this Chapter, is provided in ADFP 4, *Mobilisation Planning*. Specific preparedness objectives for the ADF, in line with this doctrine, are contained in the *Chief of the Defence Force Preparedness Directive* Chief of the Defence Force Preparedness Directive (CPD). The CPD is a classified document that is issued annually by Headquarters ADF (HQADF) and specifies operational roles and tasks, and the preparedness objectives that must be satisfied for them. Preparedness objectives are reviewed annually to ensure they remain appropriate to strategic circumstances.

The preparedness objectives are presented as annexes to the CPD in serial format with each objective specified in terms of:

- Assets required (ie. Force element or number of assets).

³² The term 'program' comes from the Defence Department's system of financial management referred to as Program Management and Budgeting (PMB). Under PMB the focus is one of management by objective within financial constraints. Within the PMB structure the Defence Department is referred to as a Portfolio to which funds are allotted. These funds are then distributed amongst the eight Department of Defence Programs, of which Air Force is one. The eight programs are Forces Executive, Navy, Army, Air Force, Strategy and Intelligence, Acquisition and Logistics, Budget and Management, and Science and Technology.

- Readiness notice.
- Operational role(s) and expected primary tasks.
- OLOC criteria in terms of equipment on hand, equipment condition, personnel and training.
- OVP.
- Sustainability period.

An example of a serial from the RAAF annex of the CPD is shown at Figure 3-4.

SERIAL	SECURITY CLASS.	FEG(1)	FE(2)	NOTICE(3)	ROLES/TASKS	PREP RES(4)	FMC(5)	FMC MLOC(6)
C38	Unclass	SRG(7)	3 RF111(8)	17 days	STRATINT(9)	Operational viability(10) 30 days Sustainability 180 days	4	3

Notes:

1. Force Element Group.³³
2. Force Element.
3. Readiness notice.
4. Preparedness resources.
5. Refers to the number of Fully Mission Capable (FMC) crews required.
6. The minimum number of fully mission capable crews from which FMC can be obtained within readiness notice.
7. Strike Reconnaissance Group.
8. In this example, the force element required for the role is three RF111 reconnaissance aircraft.
9. Strategic Intelligence.
10. Operational Viability Resources.

Figure 3-4: **Example of a RAAF Serial Format From the CPD**³⁴

³³ The RAAF's Air Command forces are organised into five Force Element Groups (FEGs). They are Strike Reconnaissance Group (SRG), Tactical Fighter Group (TFG), Maritime Patrol Group (MPG), Air Lift Group (ALG) and Operational Support Group (OSG).

Preparedness Reporting Requirements

The three environmental Joint Commanders³⁵ submit bi-annual reports on the state of preparedness to CDF, through their Service Chiefs of Staff. These Bi-annual Preparedness Reports (BPRs) identify capability deficiencies against the CPD, analyse their consequences for ADF operations, describe action taken to rectify shortfalls and estimate the time necessary to regain directed levels of preparedness. There is also a requirement to provide judgment on sustainability capability. Other reporting requirements include on-occurrence reporting of inability to meet preparedness objectives for CPD serials with short readiness notice.

CONCLUSION

The fundamental importance of preparedness for military forces is generally well accepted. Preparedness is central to the ability of the ADF to meet its commitments. It is, therefore, necessary to have developed doctrine, policies, and procedures detailing just what preparedness is, what levels of preparedness are required for what elements of the force and how these levels of preparedness are to be achieved. The balance of this study will review logistics aspects of the last part of this requirement, ie, 'how these levels of preparedness are to be achieved.'

Irregular changes in a number of areas, including strategic circumstances, strategic guidance, financial guidance and technology make the process involved in determining preparedness levels dynamic. Preparedness issues are fundamental considerations for effective defence planning which involves operations, planning, training and logistics aspects. It is apparent that preparedness involves more than logistics, though it could be argued that logistics is all about preparedness. Logistics has to maintain the force at MLOC

³⁴ As the CPD is classified, this example is only representative of the format of an Air Force serial from that document and is based on an example format from *ADF Reserve Stockholding Policy Implementation Guidance*, 1993.

³⁵ Maritime Commander Australia (MCAUST), Land Commander Australia (LCAUST) and Air Commander Australia (ACAUST).

and enable the force to work-up to and maintain OLOC. The balance of this study discusses logistics within the context of preparedness.

CHAPTER FOUR

LOGISTICS IN CONTEXT

I don't know what the hell this logistics is that Marshall is always talking about, but I want some of it.

*Fleet Admiral E.J. King USN
(To a staff officer in 1942)³⁶*

INTRODUCTION

Logistics is not a subject that stirs the passions in young warriors, nor more unfortunately, in many warrior generals. Similarly, no-one could accuse military historians of conducting exhaustive studies on the impact of logistics on war. Martin Van Creveld muses that there are hundreds of books on strategy and tactics for every one on logistics, despite logistics making up as much as nine tenths of the business of war.³⁷ Even then, most studies generally have a narrow focus.

Most logistics studies have tended to concentrate on the land environment with very little attention paid to logistics support for air operations. Even official work within the RAAF has tended to treat logistics in a narrow, or restricted, fashion. That is, the RAAF has tended to say 'This is a study of operations, that is a study of logistics.' rather than 'This is a study of war that involves the interaction between both operational and support aspects.' This is not to say that logistics should have an ascendancy over strategy or tactics. Rather it is a means to an end. However, to treat logistics as an afterthought is to court disaster.

The importance of logistics in the provision of air power is often understated. Failure to provide adequate attention to logistics in planning, exercising or resource allocation can undo the most efficient operational forces. This point has not yet been fully accepted. General Charles A. Horner USAF, commander of all coalition air assets in the Gulf War, recently made the following comment:

³⁶ Quoted in [United States] *Doctrine for Logistics Support of Joint Operations*, Joint Publication 4-0, Washington DC, 1995, p I-6.

³⁷ Van Creveld, *Supplying War*, Cambridge University Press, Cambridge, 1977, p 231.

Two areas where all the military people in this room have failed are in exercising logistics and intelligence. They're the two most important aspects of warfare you will face when the real time comes.³⁸

This study focuses on those aspects of logistics support which impact directly on the conduct of air operations. To do this, it is first necessary to understand the various elements that constitute the war making potential of a country and the importance of the inter-relationship of these elements. Based on this, an examination of what constitutes military capability can be made, which will show how logistics is much more than a support to this capability but rather forms an essential and integral part of it. In going through this process there is an examination of some of the common misconceptions which arise when assessing the military capability of a nation. These misconceptions can lead to the making of erroneous or counter-productive decisions in areas such as resource allocation, training and exercise requirements and in the development of concepts and plans.

ELEMENTS OF A NATION'S WAR MAKING POTENTIAL

General

There are several elements that make up the war making potential of a nation. They come from within and outside the armed forces themselves and indeed from beyond the nation's borders. There is a large degree of overlap and interaction between these elements.

National Will

There are three important aspects to national will. The first of these is the willingness, as distinct from capacity, of a nation's people to fund the forces necessary to achieve the nation's aim(s). Of course just what forces are necessary to do this involves subjective judgment.

³⁸ Horner C.A., 'New Era Warfare', Stephens A. (ed), *The War in the Air 1914 - 1994*, Air Power Studies Centre, RAAF Base, Fairbairn, Canberra, 1994, p 330. *The War in the Air 1914-1994* are the published proceedings of a conference held by the Royal Australian Air Force in Canberra in March, 1994. The Paper, *New Era Warfare*, was the conference after dinner speech given by General Horner. To reinforce his point, it should be noted that his audience included a large number of senior air force officers from around the world, amongst whom were many one, two and three star officers, including a number of regional air force chiefs.

Second, national will refers to the intention of a nation to use force to achieve its aims. A nation may possess the capacity to employ force to achieve a specific aim but must also possess the willingness to pay whatever the price may be for doing so. This price may be measured in numerous ways, including financial cost, loss of standing in the international community, social disruption in its own or another community, loss of lives or injuries amongst the defence force, non-military deaths and injuries, unintended damage to other than military targets (on both sides of the dispute), and long term ill-feeling between the belligerents.

The third aspect is the perception of the nation's will that other nations hold. If deterrence is an element of a nation's defence posture, as it is with Australia³⁹, then a potential adversary must know both that you possess the necessary force and that you are prepared to use it. This perception of the nature and strength of national will is important to allies and friends as well. They are more likely to provide support and honour agreements when needed if they are comfortable that this will be reciprocated.

Political Considerations

Political considerations have a significant impact on the conduct of military operations by a nation or alliance. Also, the stability, strength, efficiency and influence of a nation's political system, more so than its type (ie. democratic, autocratic, communist, etc.), impacts on the capacity of a nation to conduct operations and influence the course of events.

An Australian example of political actions taken because of, and having an influence on, military operations occurred during World War II. Australian Prime Minister, Robert Menzies, proposed the establishment of a National Government, comprising members of all political parties represented in Parliament. The Australian Labor Party, however, found this unacceptable and instead Menzies established the Advisory War Council (AWC), initially consisting of four Government ministers and four members of the Opposition. This

³⁹ In *Defending Australia - Defence White Paper 1994*, escalation, including the possibility of strategic strike, is stated as an option available to Australia (p 24, para 4.12). Further, Australia's Minister for Foreign Affairs, Senator Gareth Evans, has stated that the first policy dimension, amongst many, required to shape a favourable security environment, is '... a military capability designed to deter, and if necessary defeat, aggression against territory or maritime jurisdiction.' (Evans G., 'Security in the Asia-Pacific Region', *Defense 95*, Jane's Information Group, Surrey, United Kingdom, 1995, p 52.).

political arrangement had a significant impact on the Australian war effort.⁴⁰

It has also been argued that Australia's commitment to the Gulf War was driven by political considerations. David Horner has made the following observation on Australia's Gulf War involvement:

All wars are political, but in the case of the Gulf War, the political considerations were substantial even though the commitment was small in size. Terry O'Connor was correct when he wrote in October 1990 that there was no outstanding military reason why the Australian Task Group was needed in the Gulf but that it was there for political reasons. However, the political reasons were international rather than domestic, in that the government assessed that it was in Australia's wider security interests for it to contribute to the Gulf operations.⁴¹

Economic Factors

Modern warfare is a hugely expensive undertaking and the strength of a nation's economy is a vital consideration in assessing its capacity to engage in military operations. A nation must also have the economic capacity to acquire, maintain and support its forces on a day-to-day basis. The strength of a nation's economy is based upon many factors including human resources, access to raw materials, technology levels in all sectors of the economy (ie. rural, industrial, and commercial), the capacity of various sectors to compete on international markets, the standard of service provision (power, water, etc.), adequate allocation of resources to research and development to improve efficiency and develop new markets, and the national infrastructure.

Human Resources

⁴⁰ Robertson J., *Australia at War - 1939-1945*, William Heinemann Australia, Melbourne, 1981, pp 32-33. This book was written by John Robertson whilst he was a member of the History Department, Faculty of Military Studies, University of New South Wales at Duntroon. Throughout the book there is reference to the importance of political influences on the conduct of the war from Australia's perspective. Chapter 4 (Politics and Command, 1939-1945) in particular is of relevance to readers who may wish to examine this subject in more detail. Another excellent book that discusses the political influences during World War II is Horner D.M., *High Command - Australia and Allied Strategy 1939-1945*, George Allen and Unwin Australia, North Sydney, 1982.

⁴¹ Horner D., *The Gulf Commitment - The Australian Defence Force's First War*, Melbourne University Press, Melbourne, 1992, p 202.

The size, demographic make-up and education levels of the population are of great importance in determining a nation's war making potential. The availability of adequate numbers of people with the appropriate skills, or capacity to rapidly learn these skills, is imperative to provide for the requirements of the defence forces and the supporting civil infrastructure for day-to-day activities and for expansion when required. The make-up of the population by gender and age groups, social values, and religious and ethnic backgrounds is also relevant, albeit to differing degrees between nations. For example, the availability of suitably qualified personnel to serve in the defence forces or supporting areas in Australia is enhanced by comparison with Arab nations because of differing social attitudes to the employment of women.

Likely Support From Other Nations

The military capability of a nation can be directly and significantly effected by the support that it can expect to receive from friends and allies. This support can be provided by either the direct involvement of combat forces or more indirect involvement, such as assistance in the logistics, intelligence or political spheres. This type of assistance can be formalised and tailored to the areas of greatest value through the establishment of alliances and agreements between nations. The thinking of a potential adversary can be significantly influenced by its perceptions of the possible intervention, directly or indirectly, of third party nations, particularly if the third party is a powerful nation such as the United States. Caution is necessary in that realistic appraisals of the value and assurance of possible third party support must be undertaken. Too heavy a reliance or too strong a faith in such support may be dangerous.

Enduring Environmental Factors

There are certain enduring environmental factors that impact significantly on a nation's war making potential, influencing the way that nations develop their armed forces and military strategies. These factors are geography, distance and climate, with the first two being closely linked. In Australia's case, they play a significant part in the nation's defence posture. Australia's location means that any potential aggressor will most likely have to approach from the north and cross an air-sea gap. In the north of the country there are large distances between areas of infrastructure and quite difficult terrains that vary markedly across the north of the continent. The country also experiences a large range of harsh climatic conditions which can be very demanding on both people and

equipment. These environmental factors present both advantages and challenges to the nation's defence planners.

National Support Base

Nations are at a severe disadvantage if they do not have the indigenous capacity to provide a large portion of the industrial and infrastructure requirements of their armed forces. The nation's industrial capacity provides support in the manufacturing, repair and maintenance of equipments and facilitates movement through the airline, road freight and rail industries. The national civil infrastructure plays a vital role through the availability of services and facilities such as communications, water, power, airfields, ports, and rail and road networks.

For the purposes of discussing the support requirements of armed forces, the national support base can be considered to be the national infrastructure plus the sum total of all of the other elements of the war making potential of a nation, other than those listed in this Section as *Likely Support from Other Nations* and *Enduring Environmental Factors*. Complete self sufficiency is beyond the capacity of even the United States although a degree of self reliance, even at the cost of a premium, is a goal of most nations.

Where part of the necessary support cannot be provided from the national support base there must be a prepared plan for obtaining it in a contingency. This is a difficult task because a service or product provided to the armed forces from the national support base may itself be dependant on overseas support (for piece parts for example). With profit as its driving motive, private enterprise will not be prepared to pay a premium to ensure the availability of any more of the necessary service or product than for which they have an immediate requirement unless they receive some form of incentive to hold excess capacity.

Armed Forces

The armed forces of a nation consist of weapon platforms, weapons, military infrastructure such as airfields, maintenance and fuel storage facilities, doctrine, procedures, appropriately trained personnel, command, control, communications and intelligence (C3I) and logistics support structures. The armed forces, as well as being used in other roles such as peace-keeping and disaster relief, are the instrument through which the nation's aims are achieved when force is used, threatened or implied.

Summary

Whilst the armed forces are the instrument through which a nation delivers military force, all of the elements of a nation's military capacity may be the target of an adversary's employment of force. The destruction or weakening of elements of a nation's war making potential other than the armed forces can just as surely achieve, or assist in achieving, an adversary's aims as defeat of the armed forces in combat. The United States did not suffer an outright military defeat in Vietnam. They faced a deliberate and successful campaign to weaken the national will. Americans could see that their enemy was prepared to fight for as long as it took to achieve its aims and would not engage in a final set piece battle. The American public actively questioned their nation's involvement in the war and grew tired of the stream of dead and injured that were coming out of Vietnam.

Nations can most effectively use or credibly threaten force when all elements of a nation's war making potential are appropriately geared for the task at hand. Having strong armed forces may not, of itself, be sufficient. The constituent elements that make up a nation's war making potential overlap and interact with each other. Nations which best understand this and make the best attempts to harness all of the elements are those which are also best able to provide the necessary military capabilities to achieve their aims. There is a synergistic effect in preparing strategies which are based on employing all elements of a nation's war making potential rather than on employing combat elements and 'tacking on' other considerations as they come to mind. Indeed, a potential problem is that some of these other elements may not come to mind in sufficient time or receive adequate attention.

Figure 4-1 shows a representation of how the various elements of a nation's war making potential combine. The extensive overlap and interaction between the elements is not diagrammatically indicated as this would clutter the Figure with a mass of double headed arrows, however, it is important to remember that the elements are not discrete entities working in isolation from each other. The armed forces are shown near the head of the arrow, not to indicate that they are more important than the other elements, but to indicate that it is through the armed forces that the war making potential of a nation is manifested. The essential point is that to achieve the maximum possible combat power a nation must plan for a national approach to defence.

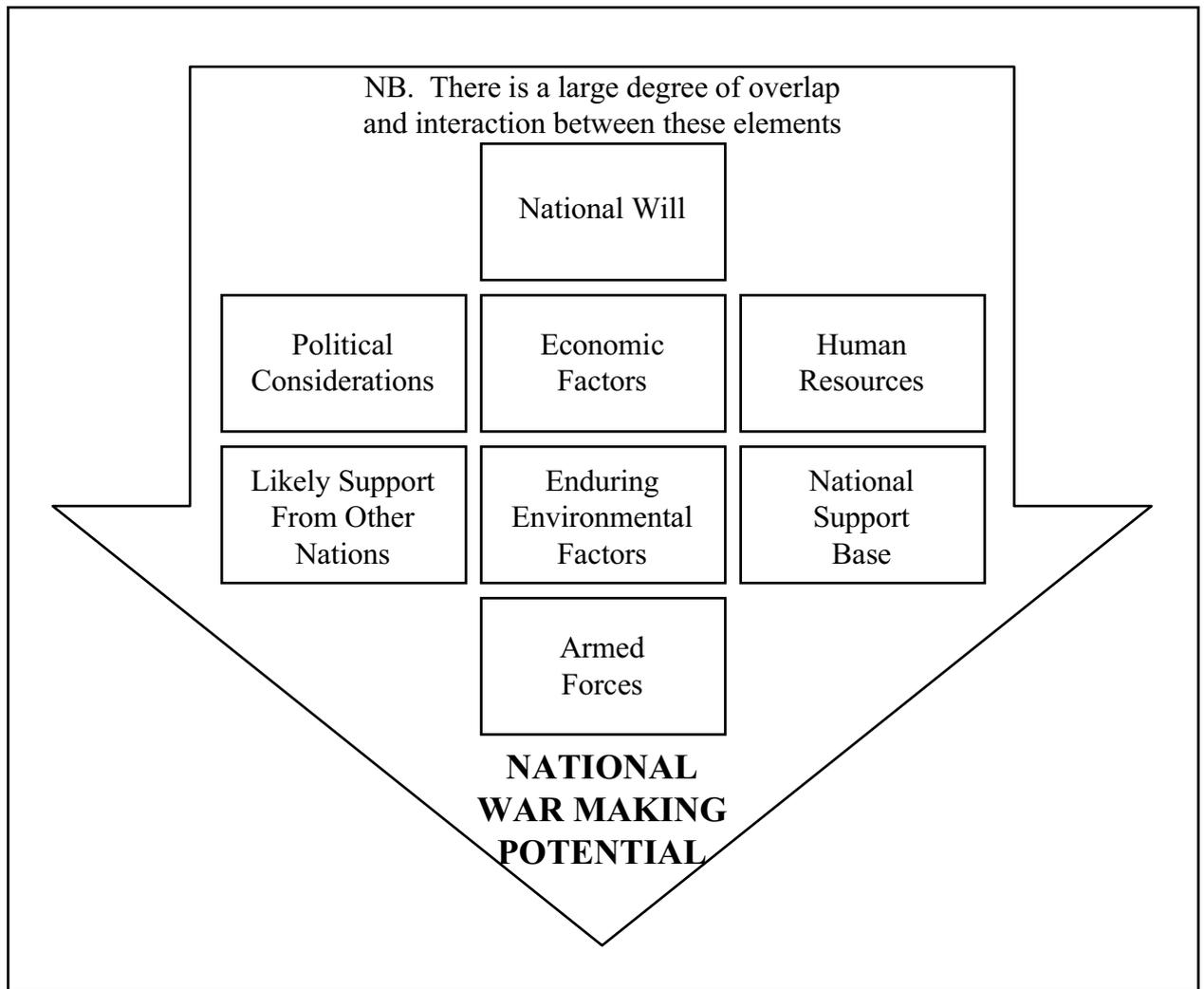


Figure 4-1: **National War Making Potential**

**ORBATS AND TOOTH TO TAIL RATIOS - SO WHAT !
(MEASURING CAPABILITY)**

General

As a matter of course all nations attempt to make assessments of their own and other nations' capabilities to conduct

military operations. Indeed, Australia's strategic guidance states that its defence planning is based on capabilities that could credibly be used against it.⁴² Measuring the capabilities of military forces is an exceptionally difficult undertaking. It is difficult enough to assess the capabilities of one's own forces let alone those of other nations. Indeed, this is often done inaccurately. Commanders have often paid equally dearly for not accurately assessing the capabilities of their own forces as for misjudging those of their adversaries. What then constitutes military capability and how do we measure it? Of more relevance to this study, what are the most common errors in measuring the capability of your own forces?

What is Military Capability?

As discussed in Chapter Three, military capability is defined in ADF policy as being the combination of force structure and preparedness through which a nation exercises combat power.⁴³

Military capability is the capacity of a nation to achieve its aims through force. If a potential adversary knows that a nation possesses the military capability to achieve its aim and that it also possesses the national will to use that capability, then the aim may be achieved without the need for military engagement. The military capability was, therefore, equal to the task. Thus military capability, depending on a nation's aims, may incorporate an element of deterrence. Nations would ideally like to see a correlation between their aims and their military capability. Nations with intentions towards geographic expansion would require different capabilities from those nations who seek only to defend their sovereignty or from others whose main aim is internal stability. The differences would be in both size and structure. Other determinants would include the capabilities of the potential adversary, geography, climate and resource availability.

Orders of Battle

A commonly used but quite incorrect method of measuring military capability is the use of Orders of Battle (ORBATs). Lengthy lists of sophisticated military hardware can indeed make the war fighting potential of nations look impressive. Many major defence journals have annual issues which list the known ORBATs of nations. Similarly, aviation journals provide lists of aircraft by type and model, including the armaments which these aircraft are configured to carry. It might appear that these ORBATs provide convenient and easily assessable guides to military capability, but most military officers

⁴² *Defending Australia - Defence White Paper 1994*, pp 22-23, paras 4.5-4.7.

⁴³ ADFP 4 *Mobilisation Planning*, Director of Publishing, Department of Defence, Defence Centre, Canberra, 1995, Glossary.

would readily explain that these ORBATs are but one piece of the jigsaw puzzle.

Possession of certain aircraft is only one element of capability. Tarmacs with rows of sophisticated and capable aircraft are of limited value in operations or even as a deterrent without trained and dedicated people, adequate infrastructure, well thought out doctrine, policies and procedures, appropriate command, control, communications and intelligence structures, and strong logistics support capabilities. Further, the other elements of a nation's war making potential must be considered. Notwithstanding this, many still attempt to use ORBATs as a full measure of capability because they are simple and readily accessible.

Tooth-to-Tail Ratios

An often misused and misunderstood term is 'tooth-to-tail ratios'. It is not uncommon to hear service personnel and politicians refer to the satisfactory nature, or otherwise, of the tooth-to-tail ratios of armed forces. Whilst such ratios may have some utility for planning purposes, this is invariably not the context in which they are used. They are too often referred to as an end in themselves, with the belief that the higher the tooth-to-tail ratio the more efficient the force is, or the more 'bangs for the buck' that can be achieved. If a force has, over the last 12 months, altered its tooth-to tail ratio from 50:50 to 60:40 is it now a better, more capable force? Is a ratio of 70:30 better still? Is a ratio of 90:10 nearing perfection? Regardless of whether the ratio is referring to resource allocation, employment of personnel or whatever, the utility of such a tool as a measure of efficiency or military capability in its own right has no value and could be potentially dangerous.

Surely a determination of what capabilities are required must first be made. Then a determination of the combat forces and logistics elements required to deliver it can be made. If the capability is then provided in the most effective way, with due consideration to efficiency, then the tooth-to-tail ratio as a final measure is entirely without relevance. For example, Dr. James A. Huston, made the following observation on tooth-to-tail ratios in the Korean War:

What counts [in determining the ratio of combat troops to service troops] is the total amount of effective fire power that can be brought to bear against the enemy. If the greatest total of effective power can be delivered with one combat man for each service man then this is the desired ratio, but if 1,000 service troops for one combat man are

needed to achieve that maximum, then that is the desired ratio.⁴⁴

Air Forces have always required large support forces. One pilot may take off in his aircraft, but behind him there is a team of personnel that carries out maintenance, supply, catering, air traffic control, airfield defence, service provision, communications, etc. It could reasonably be argued that advancing technology is shifting the balance, in terms of numbers of personnel, back from the majority in contact with the enemy towards the majority in the logistics base. This impact of technology on the tooth-to-tail ratio has been recognised for some time. In 1959 Rear Admiral Eccles USN (Ret) stated that the increasing technology of weapon systems was decreasing the number of combat personnel in contact with the enemy whilst increasing the total personnel required.⁴⁵

A further complicating factor in measuring 'tooth-to-tail ratios' for personnel is that not all support personnel are necessarily non-combatants. Many of them will be subject to attack from the enemy due to the vital nature of their functions. They may also be required to engage the enemy in direct combat. The RAAF recognises this in the training that is provided to base support personnel to enable them to undertake defence of air bases from ground threats. It is interesting to note that an infantryman in the army is considered to be part of the 'teeth' whilst a member of the Air Force employed on Base Combatant Personnel (BCP) duties as a task secondary to their specialisation, with the same requirement to engage the enemy, and a similar likelihood of being killed or wounded, is considered to be part of the 'tail'.

Although not intended as such by those who use it, the expression 'tail' can be taken as a demeaning or derisive term. It implies that those functions and people that are not 'teeth' are a less important element of the force that can be pruned, without greatly impacting on capability, when budgetary pressures become difficult.

⁴⁴ Dr. Huston James A., *The Sinews of War - Army Logistics 1775-1953*, U.S. Government Printing Office, Washington D.C., 1970, p 674. Dr. Huston, at the time of writing this book, was a Professor of History at Purdue University and an infantry colonel in the US Army Active Reserve. He served as a US Army infantry officer in Europe during World War II and was a member of the faculty at the US National War College in 1966-67. He has written extensively on military and international affairs.

⁴⁵ Eccles H.E., *Logistics in the National Defense*, The Stackpole Company, Harrisburg, Pennsylvania, May 1959, p 304. The late Rear Admiral Eccles retired from the US Navy in 1952 after 30 years service. He commanded two submarines, including operational command during WWII. His experience in military logistics is extensive and his writings and theories on logistics in a combat environment are still widely respected. He is still quoted in official US military publications.

The artificial division of the force into these two categories is not conducive to a team approach, or most importantly effective results.

In discussing a new battlefield balance between combat and support forces after the Gulf War, two members of the US House of Representatives Committee of Armed Services, including the Chairman, Les Aspin, said:

As such, these changes in warmaking [high technology leading to around-the-clock warfare] placed enormous pressure on the logistics system. What might have been a sufficient support system for a slower-paced, shorter war was strained in many places during the furiously-paced Gulf War. It is clear that the old 'tooth-to-tail' relationship between support systems and combat systems needs careful review.⁴⁶

Arbitrary determinations on desirable 'tooth-to-tail' ratios should be discounted. The makeup of the force should be determined by factors such as the likely total logistics requirements and where and when they may be needed, the adequacy of the transportation resources that are expected to be available, the length of the Lines Of Communication (LOCs), the capacity of the local support infrastructure and the nature of the operations that may be conducted. Adequately trained and equipped logistics personnel must be available to make ready and sustain operations when required. These views are reflected in the current doctrine of the US Armed Forces which states:

The aim of any military organisation is to produce the greatest possible combat power with the resources available. Commanders must determine the proper balance based on the differences between various logistic and operation concepts. Efforts to enhance combat power by arbitrarily shifting logistic manpower into combat units may achieve the opposite result.⁴⁷

Operational Focus vs Focus on Operations

The mission of the RAAF is to:

⁴⁶ Aspin L., Dickenson W., *Defense For a New Era - Lessons of the Persian Gulf War*, US Government Printing Office, Washington DC, 1992, p 34.

⁴⁷ [United States] *Doctrine for Logistic Support of Joint Operations*, p II-5.

Prepare for, conduct and sustain effective air operations to promote Australia's Security.⁴⁸

This is the reason for the existence of the RAAF. Everything that the Air Force does must, either directly or indirectly, be related to the preparation for, conduct of, or sustainment of air operations. There is nothing new in this statement; the performance of tasks to achieve the mission of the organisation represents currently accepted management theory. This then suggests an operational focus in all that the Air Force does. This operational focus has not always existed in the RAAF as obviously as it does now and the development of this focus is achieving a great deal in appropriately directing the efforts of the Air Force's personnel.

The need for such a focus is greatest in the support areas where the relationship to operations of all of the tasks being performed is not always readily apparent. In the field of logistics, current strategic guidance states that there should be clear linkages between operational needs and logistics requirements. This guidance is expressed in the *Defence Logistics Strategic Planning Guide*.⁴⁹ This document lists four principles which are the primary guidelines for the achievement of an effective and efficient logistics capability for the ADF. These four principles were stated in Chapter Two. The first of these principles is:

Focus logistic support on military capability.

This principle addresses, inter alia, the requirement to maintain a logistics capability to support preparedness objectives and the clear definition of logistics resources for readiness and sustainability purposes. The third goal for this principle is:

Relate logistic support directly to operational capability.

The strategies for achieving this goal are:

- Develop logistics planning methods and systems which will assist Force Elements (FEs) to achieve their preparedness objectives.
- Develop concepts for logistic support of operations at the ADF, Environmental Command and FE levels.

⁴⁸ DI(AF) AAP 1010 *Chief of the Air Staff's Planning Directive - The 1994-98 RAAF Plan*, Directorate of Air Force Planning, Canberra, 1994, sect 1, ch 4, para 310.

⁴⁹ *Defence Logistics Strategic Planning Guide*, (3rd Ed). This document, prepared by Logistics Division within HQADF, has been endorsed by CDF and the Secretary as the Defence planning guidance for logistics policy, systems and associated facilities development into the next century.

- Develop logistic information systems which allow operational commanders to assess critical aspects of their logistic support capability.
- Employ key logistic performance measures for the monitoring and reporting of logistic effectiveness against readiness and sustainability objectives.⁵⁰

This high level guidance for the requirement to have an operational focus in logistics support combined with the stated preparedness targets outlined in the *Chief of the Defence Force Preparedness Directive* (CPD) provides a good basis on which further work on logistics can be undertaken. This further development of logistics support and the preparedness objectives of the CPD are discussed in more detail in subsequent Chapters. The point is that the ADF is formally developing a more operational focus in the way it conducts business and that this will have a positive effect on the ability of the Services to achieve their respective missions.

An operational focus in a RAAF context is an acceptance that everything that is done must relate to the preparation, conduct and sustainment of air operations. If it does not, then the reason for the task being performed at all must be seriously questioned. This does not mean that the task must be operational. For example, the preparation of Contingency Maintenance Plans (CMPs)⁵¹ can not in any way be described as an operational task, and indeed these CMPs, once prepared, may not be used for years, if at all. However, their preparation clearly has an operational focus and the task is most definitely geared to the preparation for effective air operations as stated in the RAAF mission.

One of the mistakes that has sometimes been made in the RAAF is that there has been a focus on operations rather than an operational focus in our planning. The distinction is that the former results in a concentration on only one of the elements of a nation's war making potential discussed earlier. Further, within that one element, ie. the armed forces, only the operational forces are looked at in detail. The manifestation of this incorrect focus is in the preparation of concepts that concentrate exclusively, or almost exclusively, on operational aspects. The development of concepts and plans that focus on operational aspects in isolation from, or with inadequate attention to, support considerations is to leave to chance

⁵⁰ Ibid, pp 20-21.

⁵¹ Contingency maintenance plans are prepared programs for the maintenance of weapon systems during contingencies which differ to the usual peacetime programs. The intention is to increase weapon system availability.

or afterthought some of the major determinants of the outcomes of operations.

One analysis of the Gettysburg Campaign during the American Civil War discussed the tactical and strategic impact of logistics and the following assessment was made of Confederate General Robert E. Lee:

The final dictum of history must be that whatever excellence Lee possessed as a strategist or as a tactician, he was the worst Quartermaster-General in history, and that, consequently, his strategy had no foundations, with the result that his tactics never once resulted in an overwhelming and decisive victory.⁵²

Plans or concepts must be examined for their logistics feasibility and cost implications, and be subject to parallel planning to enable adequate support procedures to be put in place. This is not to suggest any ascendancy of logistics planning over operational planning, but dentists do not after all merely concern themselves with the health of their patients' teeth. Strong, healthy teeth would greatly concern a dentist if they were loosely embedded in decaying bone, and diseased and neglected gums.

CONCLUSION

In developing military capabilities for the defence of Australia, it is essential that the context of logistics be clearly understood. Operational doctrine, concepts and plans should not be developed without due consideration being paid to the other elements of a nation's war making potential. Logistics is not an adjunct to a nation's military capability. It is an essential and integral part of it. That fact must be fully accepted if a credible and effective force is to be developed. Only then can a nation most effectively utilise, or credibly threaten the use of, its combat power.

The Air Force must measure its capability by its ability to successfully conduct specified tasks within the necessary time scale and then be able to sustain those activities for as long as required. Other erroneous measures of capability, such as ORBATs and tooth-to-tail ratios are, in the final analysis, meaningless or even potentially dangerous.

⁵² Major General J.C. Fuller, in *The Logistics of Waging War*, p 44.

There must be a focus on achievement of the mission. This means not merely concentrating on operations but also giving thought to those activities without which operations could not be initiated or continued. This is important to remember in all that we do. All elements need to be focussed towards one objective: success in operations. In summary this can be expressed as having an operational focus rather than a focus on operations.

CHAPTER FIVE

LOGISTICS ASPECTS OF AN OPERATIONAL FOCUS

The first essential condition for an army to be able to stand the strain of battle is an adequate stock of weapons, petrol and ammunition. In fact the battle is fought and decided by the quartermasters before the shooting begins.

Field Marshal

*Rommel*⁵³

INTRODUCTION

To set the bounds for the subsequent discussion in this study on logistics doctrine and support concepts, it is necessary to examine what constitutes logistics and what elements of logistics are essential to the conduct of air operations.

The prime joint publication of the United States armed forces states:

The essence of flexibility is in the mind of the commander: the substance of flexibility is in logistics.⁵⁴

Flexibility is often referred to as an inherent quality of air power - particularly in the manner in which air platforms can perform a variety of tasks and change quickly from one task to another. However, there is an aspect to flexibility that is common to all forms of combat power. It is this aspect that Rear Admiral Eccles was referring to in the above quotation. An appropriately planned and executed logistics support system can provide another dimension to a commander's flexibility. Conversely, a failure of logistics can severely limit a commander's options, or indeed lead to failure.

⁵³ This quote is from Van Crevelde M., *Supplying War*, p 200. Martin Van Crevelde, who is a well respected writer on military matters, asserts that the quoted realisation of Rommel's came too late to save him from failure in North Africa.

⁵⁴ Joint Pub 1, *Joint Warfare of the US Armed Forces*, US Government Printing Office, Washington DC, 1991, p 31.

AN APPROACH TO LOGISTICS

Scoping Logistics

The currently endorsed ADF definition of logistics is:

The science of planning and carrying out the movement and maintenance of forces. In its most comprehensive sense, those aspects of military operations which deal with:

- design and development, acquisition, storage, movement, distribution, maintenance, evacuation and disposition of materiel;
- movement, evacuation and hospitalisation of personnel;
- acquisition, construction, maintenance, operation and disposition of facilities; and
- acquisition or furnishing of services.⁵⁵

This official definition was taken from the US armed forces where it has remained virtually unchanged since 1953.⁵⁶ The currently endorsed definition is not reflected in the organisational structure of the RAAF. There is no single logistics entity that is responsible for all of the functions listed in the definition. This should not, however, pose an insurmountable problem if there is recognition of the requirement for an integrated approach to the provision of logistics support. This is an extremely important issue as such a recognition is not universal. The next section on *Functional Integration* discusses this issue in more detail.

The functions that are performed under the heading of logistics are exceptionally varied and specialised, and each must of necessity be performed by personnel qualified in each field, ie. specialist personnel. It is in the planning and command functions that officers with an understanding of all logistics elements, and the relationships between them, are essential. It is in this regard that adequate doctrine and support concepts become critical. There must also be adequate training and exercising of the logistics role.

⁵⁵ ADFP 101 *Glossary of Terms*, Director Publishing, Defence Centre, Department of Defence, Canberra, 1994.

⁵⁶ Rutenburg D.C. and Allen J.S. (Ed) *The Logistics of Waging War*, p 132.

Because specialist personnel from different organisational entities within the Air Force will have their functions integrated in the support of operations, the doctrine and logistics support concepts must receive endorsement at the highest level. This occurs with doctrine, as the end result of the review process is doctrine approved by the Chief of the Air Staff (CAS). It is also equally important with logistics support concepts, and approval of each concept should occur at the highest appropriate level. This will be discussed further in Chapters Nine and Ten.

If each of the functions listed in the endorsed definition are appropriate for inclusion, it is equally important to briefly discuss those support functions that do not constitute logistics. There is more involved in the support of operations than logistics, though all support functions have an inter-relationship that must be understood if the support is to be most effective. The total of all support activities is 'administration' which is defined as:

The management and execution of all military matters not included in strategy and tactics; primarily in the fields of logistics and personnel management.⁵⁷

Clearly there are a range of functions outside logistics that are necessary to support operations, including finance, information systems, personnel and ground defence.⁵⁸ The interaction between these functions and logistics functions is large. Logistics both supports, and is supported by, these other activities. Personnel may be involved in more than one function. For example, during the conduct of operations logistics personnel would perform their usual functions as well as having some ground defence responsibilities. Previous discussion in this study has highlighted the necessity of understanding the interaction between operational activity and support activity. These interactions, designed to produce the maximum effective combat power possible, need to be considered in the development of support concepts.

Functional Integration

⁵⁷ ADFP 101 *Glossary of Terms*. This discussion is referring to the support of operations and ADFP 101 lists a second definition of administration as 'Internal management of units'.

⁵⁸ This study discusses activities that are necessary for the generation and sustainment of air power. In that respect ground defence is a support activity in that it provides the necessary security of air bases from which air power is launched and of installations that provide other types of essential support for air operations.

The RAAF has endorsed a management philosophy of Integrated Logistics Support (ILS) which aims to provide effective and efficient life cycle logistics support of weapons systems, commensurate with preparedness requirements and at minimum life cycle cost. ILS comprises the following ten elements:

- Management.
- Engineering support.
- Maintenance support.
- Supply support.
- Technical data.
- Support equipment.
- Packaging, handling, storage and transportation.
- Manpower and personnel.
- Training and training support.
- Facilities.

The applications of the ILS discipline are intended to continue throughout a weapons system life cycle, from the identification of the need for a new equipment to its final disposal. ILS assists weapons system preparedness at minimum life cycle cost by adopting the following approach:

- Having weapons system design requirements influenced by logistics support considerations.
- Defining logistics support requirements that are optimally related to the design.
- Acquiring the required logistics support.
- Providing the required logistics support during the in-Service phase.

Full adoption of this philosophy would result in all ILS activities becoming organisationally integrated and managed as one. This has not happened in the RAAF and is unlikely to do so in the short term. Indeed, it is not necessary for full integration to occur to achieve the advantages of an integrated approach. Whilst ILS does

not encompass all logistics functions (eg. hospitalisation of personnel) and it focuses on support of equipment (logistics also supports other areas such as personnel) the principle of functional integration can still have application to all logistics functions to some degree.

Before the concept of functional integration gained general RAAF acceptance, there was a focus on the optimisation of single function performance brought about through the development of stovepipe management systems. That is, separate organisational structures aimed to achieve optimal performance for the functions for which they were responsible. Hence, the individual functions of supply, engineering, maintenance, movements and transportation, facilities, acquisition, health, and design and development, were managed individually without thought to the impact, sometimes detrimental, on other functions.

The move towards integration of some of these functions has resulted in a huge leap forward in the capability of 'logistics' to support operations. The advantages of this integration are not restricted to the military environment. ILS has been embraced by private enterprise.

The supply, maintenance and engineering functions are now accepted as being integrated within the RAAF, at least to a far greater extent than was the case only a few years ago. To many, these functions together constitute logistics. The other functions have varying degrees of acceptance as components of logistics. That they are encompassed in the endorsed definition of logistics is not enough. The way we organise for, plan for and conduct the support of operations is the prime determinant of just how functionally integrated these support functions have become. For example, at the strategic level, the integration of the facilities function is far from complete. There are different organisational structures in place which would appear to mitigate against full integration. At the tactical level, however, the integration is more complete. For example, an Operational Facilities Flight (OFF) forms part of No. 1 Operational Support Unit (1 OSU).

The growing sophistication of modern weapon systems increases the complexity of performing each of the individual functions which together constitute logistics. Therefore, it becomes necessary to distinguish between the 'technical', or specialist point of view, or the 'logistics' point of view. Technical expertise within a functional specialisation is a necessity, and indeed, there is a series of specialisations required within each function. Both the 'technical' and 'logistics' viewpoints are essential, with the former having a narrower focus than the latter. For example, in a contingency situation at a deployed location, an engineer may have responsibility for returning a

number of aircraft to a serviceable state. He has a narrow focus with a technical viewpoint. The logistics viewpoint is much broader and occurs further up the command chain.

This broader viewpoint requires the following things to occur in this situation:

- The necessary maintenance must be carried out on the aircraft.
- The necessary spares must be available in the inventory.
- There must be visibility in the supply system to determine the location of these spares.
- There must be an effective distribution system to move the spares to where the engineer needs them.
- There must be facilities in place or capable of being put in place for the maintenance activity to occur.
- There must be the necessary services made available to the engineer (eg. water, power, etc.).
- There must be catering and accommodation made available to the engineer and his staff.

The logistics viewpoint requires an integrated approach to attaining the most appropriate level of logistics support for operations. Different sets of circumstances will alter the relative importance of each of the separate functions, but they must all be geared to one goal. The late Rear Admiral Henry E. Eccles USN describes the broader logistics viewpoint simply and succinctly by relating it to the requirements of command:

.... logistics itself has no purpose other than to create and to support combat forces which are responsive to the needs of command.⁵⁹

There is a temptation to view support aspects along organisational lines. If the organisation is not integrated then the integration of planning and policy may become 'too hard'. We should be careful not to confuse the technical viewpoint with the logistics viewpoint. The commander at the tactical level simply wants the necessary logistics support for the effective conduct of operations.

⁵⁹ Eccles H.E., *Logistics in the National Defense*, p 9.

This may be achieved through further integration of the RAAF's organisational structure or improving communication through organisational entities. The latter option may be considered a horizontal flow (of information and ideas) across vertical organisational 'boundaries'. This would suggest that integration of purpose does not always require organisational integration. To redefine logistics in a manner that reflects current organisational boundaries may make the planning function more simple but will also make it less effective. Whilst it is not necessary for all logistics functions to be grouped in one organisational entity, it must be considered essential for common objectives to be established.

The necessity to provide greater integrated logistics support for operations across organisational boundaries would require high level direction, through means such as doctrine or the direct endorsement of logistics support concept frameworks. This integration is reflected in the subsequent discussion on doctrine and support concepts in this study. To achieve fuller integration of the various logistics functions within the RAAF to enhance capability to support operations may require further investigation. A further dimension is added to this issue when the joint environment is considered. Future operations will almost certainly be joint in nature and the provision of logistics support will increasingly be conducted from a joint perspective.

The USAF is continuing to progress towards a greater level of integration of their logistics functions and have therefore altered the training of their logistics personnel accordingly. The following comments from the USAF Director of Maintenance, Headquarters USAF, reflect this view:

Modern logistics blurs the lines of demarcation between our separate logistic disciplines. Lean logistics basically looks at all logistics processes and integrates logistics into a single process or function.⁶⁰

Private Enterprise Practices in a Military Environment

The Air Force has always adopted some private enterprise procedures in providing logistics support to its forces. Recent changes

⁶⁰ Harris M.J., 'Now Is the Time for Career Development', [US] *Air Force Journal of Logistics*, Air Force Logistics Management Agency, Washington DC, Spring 1995, p 2. Major General Marcelite J. Harris was discussing the commencement of a major revision of career development for USAF logistics officers. The new career development path reflects a much greater recognition of the importance of an integrated approach to logistics and commenced in the USAF in October 1995.

have seen an even greater use of these practices. This has resulted in significant savings and efficiency improvements in many areas. The Air Force should monitor, and adopt where appropriate, the latest business logistics practices, especially where goals can be achieved with a more effective use of limited resources.

Care needs to be taken, however, that in adopting business practices the RAAF is continuing to achieve the correct goals. The Air Force does not, as a final goal, wish to become merely effective and efficient at conducting its day-to-day activities. Rather, the goals of the logistics elements of the Air Force centre around preparedness, and the achievement of required preparedness levels may, in some instances, necessitate inefficiencies in day-to-day activities.

While there are many similarities between business logistics and military logistics, there are also very significant differences between them. Business logistics and military logistics have different goals and this can influence the way an organisation satisfies a great many requirements. Business logistics is driven by the profit motive and many of the practices that a military force will and should undertake are quite at odds with private enterprise practices. For example, one of the prime attributes that any operational commander would like to see embodied in his forces is flexibility. However, the measures that must be taken to provide high levels of flexibility can only be provided at a price that business would find unacceptable.

The objective of military logistics is not profit but preparedness. Military logistics is about providing the wherewithal to permit operations to succeed. Lieutenant General William G. Pagonis, US Army, former Deputy Commanding General for Logistics in the Persian Gulf War, stated:

What's the biggest difference between logistics in the military and in the private sector? Without a doubt, it's our respective bottom lines, and how we think about them. The military focuses on life and death, whereas business measures profit. Both my youthful entrepreneurial experiences and my MBA training convinced me that profit is an important and meaningful measure - in the long run, it determines whether a given company lives or dies. But *real* life, and *real* death, tend to change all the calculations. We in the military must sacrifice some measure of efficiency to maintain a higher margin of safety. We stockpile a little (or a lot) extra, just

in case. We build a redundant system, such as my shadow command at KKMC⁶¹, just in case.

‘If the logistic system in question is not to be hopelessly fragile and liable to catastrophic breakdown’, writes one observer of military affairs [Martin Van Creveld], ‘if it is to function under changing circumstances and be capable of switching from one objective to the next; if, in short, it is to be capable of coping with the uncertainty that is the result of enemy action and, as such, inherent in war - in that case a certain amount of redundancy, slack and waste must not only be tolerated but deliberately built in.’ There are few for-profit concerns that live comfortably with redundancy, slack and waste.⁶²

Table 5-1 shows a comparison between aspects of logistics in the military and business environments.

⁶¹ KKMC stands for King Khalid Military City. This was a Saudi installation in the northern desert, near Iraq, that served coalition forces as a major supply and transfer centre. General Pagonis established a redundant logistics headquarters at KKMC because of his concern that his headquarters at Dhahran may be subjected to attack by Iraqi scud missiles.

⁶² Lt. General William G. Pagonis, *Moving Mountains - Lessons in Leadership and Logistics From the Gulf War*, Harvard Business School Press, Boston, Massachusetts, 1992, pp 210 - 211.

	Military Logistics	Business Logistics
Objective	<ul style="list-style-type: none"> Operational Preparedness via support 	<ul style="list-style-type: none"> Profit via superior customer service
Focus	<ul style="list-style-type: none"> Logistics engineering Acquisition strategies Life cycle costing Systems support 	<ul style="list-style-type: none"> Materials planning Strategic alliances Distribution Customer service
Starting Point	<ul style="list-style-type: none"> System design 	<ul style="list-style-type: none"> Demand forecasting
Principal Subdisciplines	<ul style="list-style-type: none"> Reliability engineering Provisioning Configuration management Supply management Maintenance Transportation and movement 	<ul style="list-style-type: none"> Materials management Order processing Inventory Warehousing Industrial packaging Physical distribution
Model	<ul style="list-style-type: none"> Integrated Logistics Support (ILS) 	<ul style="list-style-type: none"> Supplier-Firm-Customer Pipeline
Performance Measures	<ul style="list-style-type: none"> Service levels Readiness rates Sustainability 	<ul style="list-style-type: none"> Order cycle times Order fill rates Delivery reliability
Decision framework	<ul style="list-style-type: none"> Preparedness and life cycle costs 	<ul style="list-style-type: none"> Cost-service trade-off
Customer Type	<ul style="list-style-type: none"> Internal (military forces, including those of allies) 	<ul style="list-style-type: none"> Internal (the firm itself) and external (wholesale customer of the product)

Table 5-1: **Comparison Between Military and Business Logistics**⁶³

It is essential that any changes that the Air Force makes to its logistics procedures be made after consideration of all aspects of support requirements. The efficient functioning of the Air Force on a day-to-day basis is important, more so in times of resource constraint, however of greater importance is the effectiveness of the Air Force in

⁶³ Table adapted from Russell S.H., 'Military Logistics and Business Logistics: Reexamining the Dichotomy', [US] *Air Force Journal of Logistics*, US Government Printing Office, Washington DC, Winter 1994, p 32. Dr. Russell is Assistant Professor of Logistics, Business and Economics-Business Administration, Weber State University, Ogden, Utah. Dr. Russell argues that although there are differences between business and military logistics, including each having unique objectives and characteristics, there is an emerging similarity and convergence in terminology and concepts.

operations. The Commercial Support Program (CSP)⁶⁴ has been an undoubted success in the efficiency reforms and cost savings it has provided to the RAAF. However, there has been a price in that the flexibility of the Air Force has been reduced. Air Commodore Ray Conroy, the former Chairman of the Commercial Support Review Board, has stated:

But we've lost something in the process. We've lost 'fat'. We're losing the flexibility and surge capacity to do unforeseen tasks, to take on urgent tasks without notice. That means that we're going to have to manage better in the future.⁶⁵

It needs to be emphasised that this statement by Air Commodore Conroy was made in the context of his hailing the Commercial Support Program to be a success. Indeed, the cost, in terms of the loss of flexibility, may be quite acceptable, given the cost savings. However, the full effect of adopting commercial practices must always be fully measured, and decisions made with a conscious awareness of their impact on preparedness and capability. This is hard to achieve in the RAAF at present given the absence of endorsed concepts of logistics support for air operations which would readily provide a basis for the development and assessment of appropriate logistics support practices.

The Pervasiveness of Logistics

Regardless of the size of the operation being planned or the level at which planning is being conducted, logistics will always be a determinant of the feasibility, and subsequently the success, of the plan. Logistics has an impact on all military plans and concepts, and might be said to provide a common thread through planning at all levels.

Figure 5-1 illustrates the pervasiveness of logistics. The Figure represents how logistics impacts right through from the national support base and the strategic level of planning to the direct provision of the wherewithal to deliver combat power at the tactical level. Support from overseas is also indicated in a manner to show that this can be delivered at any level (although planning for it would be considered at every level).

⁶⁴ The aim of the on-going ADF-wide Commercial Support Program is to promote the transfer of activities between Defence and industry where it is operationally feasible, practicable and cost effective to do so.

⁶⁵ *Lifting the Air Force's Capability*, *The Air Force in '96*, Issue No 6, Office of the Chief of the Air Staff, Russell Offices, Canberra, February 1995, p 20.

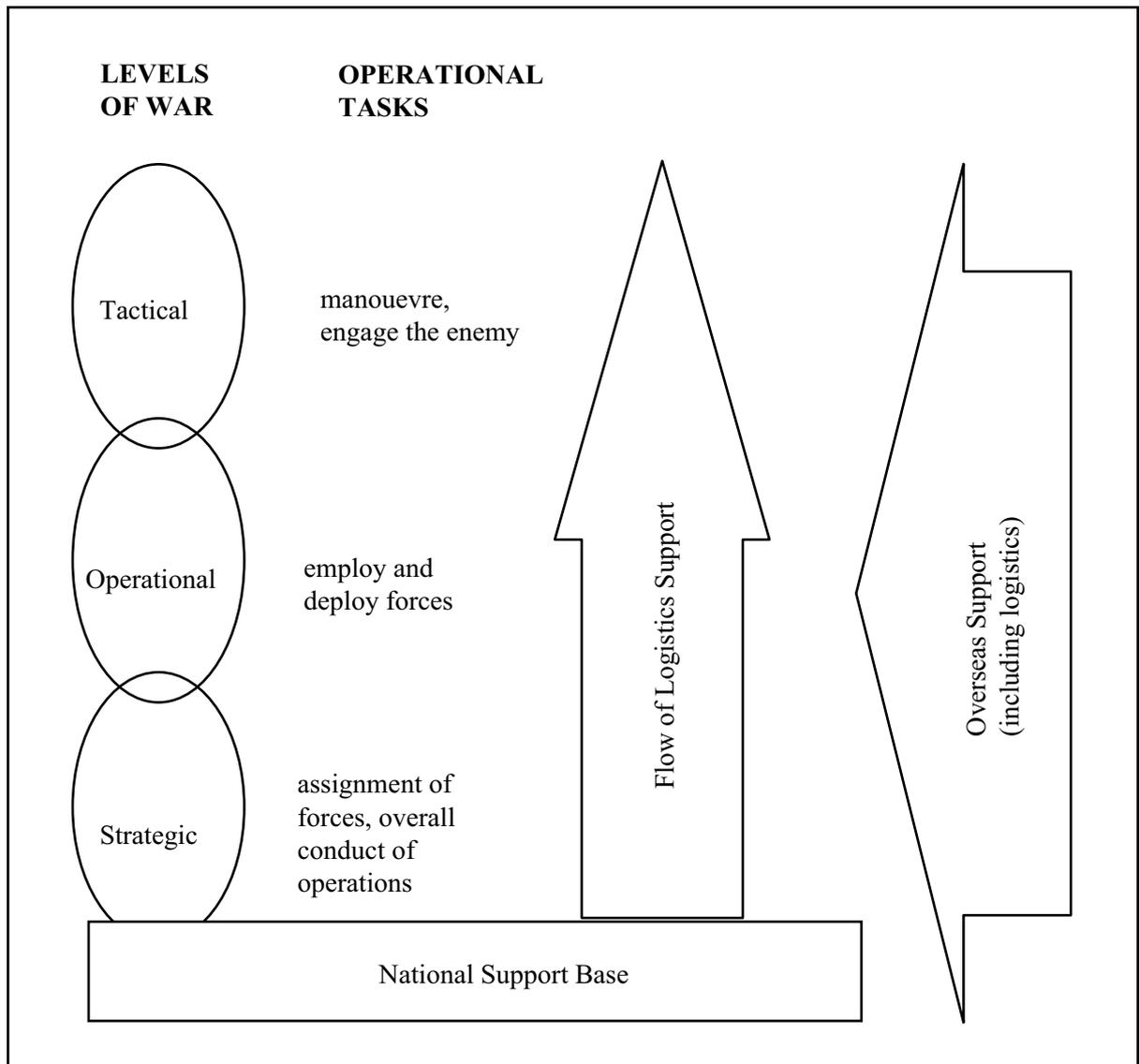


Figure 5-1: **The Pervasiveness of Logistics**

The pervasiveness of logistics means that care must be taken not to place barriers across the levels of planning or the execution of logistics tasks. Logistics support must be allowed to flow from all suppliers (of goods and services), overseas or national, through to the final support of the forces involved in the delivery of air power. The Army refers to this unbroken flow of logistics as the continuum of logistics. Integrated logistics support, in integrating the various elements of logistics, could be described as horizontal integration. The pervasiveness of logistics also suggests a requirement for a vertical integration, the difference between the levels being only

of emphasis and detail. The work conducted at each level is directed towards creating and sustaining operations.

For example, there may be good reasons to transfer supplies from one transport carrier to another upon their arrival at a Point of Entry (POE) in the Area of Operations (AO). The breaking down of consolidated loads for different final destinations would be one such acceptable reason. However, the crossing from the strategic level to the operational level, with the possible concurrent change in command of the transport assets and logistics agencies involved, would not necessarily constitute a good reason. Such an unnecessary transfer breaks the flow of logistics support, increases the handling of goods and introduces delays into their delivery.

As shown in Figure 5-1, the levels of planning overlap. The extent of this overlap must be carefully monitored. A continuous, consistent and complementary flow of logistics planning should be the goal, but at the same time guarding against each level intruding too far into other levels in their planning, which can be just as counter-productive. Such intrusion between levels, which invariably occurs downwards (ie. downwards in a hierarchical sense from the strategic level to the tactical level), can lead to duplication of effort and loss of flexibility at the tactical level. This discussion on the overlap between the levels of planning is particularly relevant to the subsequent discussion in this study on the concepts of logistics support for operations.

This continuous flow of logistics support and its planning, from the strategic to the tactical levels, does not of course mean that the satisfaction of specific logistics requirements cannot occur at intermediate levels. For example, some logistics requirements can be satisfied directly at the tactical level and this should be factored into planning at all levels.

Supporting Operations

Logistics tasks are performed in the Air Force to permit the day-to-day functioning of the Service, provide the wherewithal for future operations and provide support for specific operations. This study has a focus on the logistics support required for the support of operations. The necessity for distinguishing this type of logistics lies in the requirement to prepare for and support the conduct of operations. We must identify those tasks which will be essential to the generation and sustainment of air operations. We should then have in place concepts of logistics support that will enable us to provide the necessary logistics support to achieve this. Subsequent

chapters will cover some of the planning aspects for the provision of this support.

The term 'operational logistics' has been used in the RAAF for some time to describe those logistics activities necessary for the conduct of operations. Although the term is widely used it is not widely understood. It has come to mean different things to different people. There is no officially endorsed definition for the term in either the joint or Air Force environments.⁶⁶ Clearly the term relates to operations and most people see the results of operational logistics as the successful, or otherwise, generation and sustainment of air operations. In this context the most readily visible and obvious examples of operational logistics are at the tactical level. For example, the performance of the flight line maintenance necessary for an aircraft to carry out a sortie.

Alternatively, the term 'operational logistics' has been taken by some to refer to logistics which is related to the operational level of war, with logistics planning at the operational level being referred to as operational logistics planning. This, however, would leave out all of the logistics planning and activities performed at the tactical level and would not satisfy the generally accepted belief that the result of the planning and execution of operational logistics is most readily witnessed at the tactical rather than the operational level.

Another view of operational logistics is that it is the logistics support that is integral to a force element. In this case the logistics functions that are performed by logistics elements commanded by the force element commander are deemed to constitute operational logistics. However, this ignores some vital logistics functions which are directly related to the immediate generation and sustainment of air power. For example, an air base may be supporting a number of force elements, each with some degree of integral logistics support, but each still dependant on 'external' (ie.

⁶⁶ By 'officially endorsed definition', this study means a definition that has appeared in an official ADF or RAAF publication. Certainly the term does not appear in ADFP 101 *Glossary of Terms*. There have been various definitions appear in official papers or reports. That they have differed so markedly is a reflection of the requirement for terms to receive 'official endorsement' if they are not to lead to misunderstanding. One example of such a definition appeared in a RAAF Logistics study that was prepared in the 1980s. This study stated that logistics was comprised of four classes; operational logistics (which was defined as 'the supply of replenishment materiel such as fuel and airborne stores needed for serviceable equipment to undertake operational missions), technical logistics, domestic logistics and infrastructure logistics. (*RAAF Logistics Study*, 1986, vol 1, p 2.). This definition limits operational logistics purely to the supply function, and even then the supply of only some items. It is clearly out of touch with current thinking on integrated logistics support. The subsequent discussion in this section briefly discusses some of the currently perceived meanings of the term 'operational logistics'.

external to the force element) logistics support for the conduct of their operations.

For example, the direct provision of fuel to aircraft would be a function at the base level with the service provided to all force elements operating from that base. Another example - this time involving support from off the base - is the supply of an urgently required aircraft component which is not available locally. This component may be supplied from hundreds, possibly thousands of kilometres away. It could result in the delay or termination of a mission, but the only involvement of the integral logistics component would be the initial identification and demand of the item and the subsequent receipt and fitting of it. The other activities that take place between the demand and final fitting of the item could reasonably be considered as logistics necessary to the conduct of operations.

The lack of a widely accepted definition of the term 'operational logistics', and in particular, the understandable confusion of the term with the operational level of war, makes its use inappropriate. This study proposes the use of a new term and an associated definition to describe those logistics activities necessary for the support of operations. The term 'operations logistics' would seem clear and unambiguous. The term 'combat logistics' is not appropriate for the intent proposed by this study, as it would exclude support of those operations not involved in combat.

The term 'operation' is defined as:

A military action or the carrying out of a strategic, tactical, Service, training or administrative military mission; the process of carrying on combat, including movement, supply, attack, defence and manoeuvres needed to gain the objectives of any battle or campaign.⁶⁷

This Chapter has referred to the requirement for an operational focus in all that the RAAF does. Every activity that is performed by every Service person, public servant and Service contractor must be related to operations, directly or indirectly, immediately or in the longer term. It has also been argued in this Chapter that logistics pervades every level of war and this logistics support should be provided, as far as practicable, in a continuous, consistent and complementary flow through the various levels, strategic, operational and tactical. If these two arguments are accepted, then there is no reason why operations logistics support can

⁶⁷ ADFP 101, *Glossary of Terms*.

not come from any level of planning, any geographic location, within or outside an AO, or from any command organisation.

This study argues that the determinant of what constitutes operations logistics should be the relevance that a particular function has on a specific operation. That is, those logistics functions which are required to support a specific operation constitute 'operations logistics'.

Each logistics function may vary between being operations or non-operations. This point is explained in the following scenario. An F/A18 lands at its deployed base location with a faulty Inertial Navigation Unit (INU) and is required to take off shortly afterwards on a sortie related to the conduct of an operation. Work is carried out to remove the faulty INU and replace it with a serviceable unit. This maintenance activity constitutes operations logistics. Another F/A18 located at its home base is undergoing scheduled maintenance, during which the INU, which has been identified as faulty, is to be replaced. This second F/A18 is not required for any current or imminent operations. The replacement of the INU in this aircraft, whilst it would be performed expeditiously, would not constitute operations logistics. This does not mean that the activity is not important, only that it is not involved in a current or pending operation.

Further, operations logistics is not restricted to the AO, though it would be expected that this is where most of it will occur and where the results of all operations logistics activity will be manifested. Again a scenario will be used to illustrate this point. An F/A18 at a deployed location is required for a specific operation. It has a faulty INU which is removed but there are no remaining serviceable INUs available in the AO. The maintenance activity in the support area outside the AO that is necessary to make an INU serviceable and then the delivery of this INU to the deployed location would constitute operations logistics.

Proposed definitions for operations and non-operations logistics are provided at Figure 5-2. Also shown are logistics functions listed between the two definitions to indicate that, depending on circumstances, they can constitute either operations or non-operations logistics. The performance of non-operations logistics functions, whilst not directly impacting on a specific operation, are still relevant to the support of the Air Force overall. Because of the operational focus that the Service aims for, these non-operations logistics functions provide the wherewithal that permits operations to take place.

OPERATIONS LOGISTICS	LOGISTICS FUNCTIONS	NON-OPERATIONS LOGISTICS
Operations logistics encompasses all logistics functions, or elements thereof, which are required to generate or sustain specific operations.	<i>Design and development</i> <i>Acquisition</i> <i>Storage</i> <i>Movement and transport</i> <i>Distribution</i> <i>Maintenance</i> <i>Disposition of materiel</i> <i>Evacuation and hospitalisation</i> <i>Health services</i> <i>Provision and maintenance of facilities</i> <i>Catering</i> <i>Services</i>	Non-operations logistics encompasses all logistics functions, or elements thereof, which are not, at the time being considered, required to generate or sustain specific operations.

Figure 5-2: **Categories of Logistics Support**

CONCLUSION

Logistics activities are performed to enable the force to function on a day-to-day basis, provide the wherewithal to conduct future unspecified operations, and conduct specified operations. The ideal method for providing logistics support for each of these requirements may differ if they are treated in isolation. For example, the provision of logistics support for day-to-day activities may be likened to the requirements of supporting a business activity. However, the requirement to prepare for combat operations will involve activities that are, in some significant respects, at odds with business practices.

Logistics can be, and has been, defined in numerous ways. In a military environment it is essentially about the provision of adequate levels of preparedness. Without this preparedness effective operations cannot be initiated and continued. To adequately provide this preparedness there is a requirement for appropriate doctrine to provide guidance for the development of clearly focussed logistics policy, plans and training. Following on from the requirement for appropriate doctrine is the necessity to develop and endorse concepts of logistics support at every level of war which recognise the pervasive nature of logistics.

The subsequent discussion in this study builds on the arguments presented in this Chapter by discussing in more detail the type of doctrine and logistics support concepts that are necessary to adequately provide operations logistics support, as defined in this Chapter, to air operations in Australia.

CHAPTER SIX

SELECTED OVERSEAS EXPERIENCE

But in its relation to strategy, logistics assumes the character of a dynamic force, without which the strategic conception is simply a paper plan.

Commander C. Theo. Vogelgesang, USN (1913)⁶⁸

INTRODUCTION

This Chapter is not an exhaustive discussion of recent international events but a selected review of experiences which have relevance to the development of logistics doctrine, support concepts and practices. Not everything that has been found successful overseas is necessarily applicable to the Australian environment and care must be taken in determining which lessons learnt overseas have implications for Australia.

It is nonetheless interesting and instructive to review the recent experiences of other military forces, particularly in a world-wide environment of extensive change. This discussion looks at the Gulf War experience, current developments in the United Kingdom, and two new US approaches to logistics referred to as force-projection logistics and lean logistics.

THE GULF WAR EXPERIENCE

There are lessons that can be learned from the manner in which the US logistics system operated during the Gulf War. The US system operated with a set of imperatives for sustaining combat operations which included integration, anticipation, continuity, responsiveness and improvisation:

- Integration embodies synchronising the various elements of logistics. During the Gulf War integration of logistics with operations was shown to enhance flexibility and endurance.

⁶⁸ Quoted from Eccles H.E., *Logistics in the National Defense*, p 30. The quote comes from a pre-World War I presentation to the US Naval War College.

- Anticipation demands real-time communications and automated systems.
- Continuity requires multi-functional support, which means all elements of logistics were brought together and focussed on the operational commander's plan.
- Responsiveness was provided through high mobility, reliable distribution, advanced maintenance (including diagnostics and repair), and computer based decision support systems. Rapid reinforcement and replacement of any sustainment effort was factored into the operational plan. Responsiveness of logistics to operational requirements was enhanced due to all sustainment functions being incorporated into a single Command and Control (C2) chain and real-time visibility provided. This did not eliminate the need for improvisation, which occurred regularly, but it avoids any semblance of 'ad hocery'.

The USAF combined maintenance and spares provisioning, and collocated their Air Logistics Centres (ALCs) with flying squadrons in order to improve responsiveness. This action is similar to the RAAF's concept of Weapon System Logistics Management (WSLMs) being established on operational bases.

The US Army fielded a logistics system which provided a distributed, survivable and fully integrated supply system. This is provided from its lowest level at the direct support unit up to the theatre level. The system was designed to support independently deployed forces, yet provide asset visibility at division and corps level. An automated air loading system was also used which reduced days of manual effort to hours of automated processing. The Gulf War was the first wartime deployment of the automated logistics system and it was initially overloaded. Reliable logistics automation proved to be essential to keep pace with the highly manoeuvrable combat forces.

The final report to the US Congress on the Gulf War referred to the requirement for flexibility in operational and support concepts and the necessity for close links between them. In discussing the importance of sound planning, which it listed as one of the lessons of the war, the report stated that management systems, such as those which support deployment and logistics, must be automated with the need for flexibility in mind. Planning systems

must be able to meet unexpected contingencies and adapt rapidly to changing situations.⁶⁹

The US logistics concept had to adapt to a change in the operational concept from one which initially was primarily defensive to one which became offensive in nature. This resulted in very large increases in the tempo of operations, and increased and changing in-theatre lines of communication. The decision taken during Desert Shield to increase the size of the force also required changes to the support concepts by increasing supply, maintenance and storage requirements and increasing the burden on movement resources, both to perform the initial deployment of the additional forces and to maintain support of the increased force.⁷⁰

United Kingdom (UK) forces in the Gulf War embodied logistics planning within operational planning, which represented a conceptual change in their method of operation. For example, in the Falklands War logistics had been grouped with personnel considerations for its higher level management. This revised command and control link was found to enhance the responsiveness of the logistics system to operations and provided logisticians with a better understanding of the operational implications of their decisions.⁷¹

The Royal Air Force (RAF) found that formed and established logistics units were significantly more effective than those units made up of personnel drafted on an *ad hoc* basis. This was especially the case during the initial stages of deployment. There were also some inadequacies in the equipment levels for some logistics units which were attributable to under-funding and over-optimisation for pre-planned contingencies.⁷² These lessons were addressed in a major logistics study undertaken by the RAF which is discussed in the next section, *Current Developments in the United Kingdom*.

CURRENT DEVELOPMENTS IN THE UNITED KINGDOM

⁶⁹ *Conduct of the Persian Gulf War - Final Report to Congress*, Department of Defense, Washington DC, April 1992, Vol I, pp XXIII-XXIV.

⁷⁰ *ibid*, Vol II, Appendix F, p F-17.

⁷¹ Much of this discussion of Gulf War logistics experiences is based on Waters G., 'Logistics Observations From the Gulf War', Waters G. (ed), *Line Honours - Logistics Lessons of the Gulf War*, Air Power Studies Centre, RAAF Base Fairbairn, Canberra, 1992, pp 8-10.

⁷² Based on comments made in *Overseas Visit Report on OCOSW Visit to United Kingdom, RAF Units 4-17 October 1994*. This report is held by Headquarters Operational Support Group (HQOSG).

The collapse of the Warsaw Pact brought about a requirement for the UK and other North Atlantic Treaty Organisation (NATO) nations to rethink their operational and support postures. The RAF was structured to operate mainly from self-contained main operating bases with hardened shelters, each capable of supporting combat operations for 30 days, without undue reliance on third or fourth line support. Where they existed, mobile forces, based around the Jaguar and Harrier aircraft, planned to deploy with a spares pack sufficient to fight a 30 day war. Deployment options and Host Nation Support (HNS) in Europe were pre-planned with some pre-positioning of equipment occurring.

The change in strategic circumstances necessitated a change in RAF operational and support concepts. The new environment was seen as one of great unpredictability, where risks to the security of the UK or its allies would be multi-faceted in nature, and could arise from any geographical direction and area. The UK developed a new strategic concept which placed an increased emphasis on flexibility and mobility. This new strategy demanded the organisation of highly mobile, combined arms units capable of responding, in compressed timescales, to a wide range of eventualities. The new strategy also demanded a larger group of in-place forces, held at lower readiness levels.

The requirement to develop a new logistics support concept due to a complete change in defence posture in an environment of significantly reduced financial resources posed very significant challenges to the logistics community. The RAF initiated the Mobility and Deployed Support study (MDSS), which was one of the most significant RAF logistics studies in a number of years. The purpose of the MDSS was to consider the logistics implications of the need for greater flexibility, mobility and endurance, within the constraints of planned resource availability.⁷³

The RAF will have to support deployments from well established bases to bare bases which are often largely unsupported with difficult lines of communication. The degree of support available in-theatre will dictate the extent of the facilities that must be deployed. Given the unpredictability of the requirement for deployed

⁷³ I am grateful to staff of Logistics Command, RAF, for providing information on the MDSS. This information provided a useful insight into the manner in which the RAF is facing logistics challenges that are in many ways similar to those facing the RAAF. As this information was of a classified nature, I also acknowledge the assistance of Squadron Leader G.J. Howard RAF, who provided me with an unclassified brief on which much of this discussion on UK logistics developments has been based.

support it was decided to establish a core of deployable facilities to provide an initial capability at any deployment base.

This created a requirement for additional portable hangars and shelters and increased mobile fuel facilities. A requirement was also identified for rapid access to expected initial weapon requirements through the positioning of some stocks close to airheads. The size of the in-theatre workforce will be minimised to reduce the movement and administration loads. This will be achieved through maximising the use of host nation support and by reviewing existing personnel trade boundaries and maintenance work practices.

The new concept has increased the requirement for spares due to the need to provide ready-to-use equipment in-theatre, the increase in the number of aircraft types that may be expected to deploy and to fill extended resupply pipelines. The previous procedure was to prepare Fly Away Packs (FAPs) which were deployable holdings of spares designed to provide a notional 30 day period of self sufficiency. FAPs were held at the same readiness as the aircraft which they were designed to support.

The new operational concept brought about two changes that made this practice insupportable. First, the number of aircraft types that were required to be deployable away from their main operating bases was increased significantly. Second, the increased uncertainty about the duration and location of future scenarios resulted in increases in the periods of required self sufficiency. For example, some scenarios are based on a deployment period of up to 180 days for advance forces and 120 days for main forces. FAPs designed to provide self sufficiency for the RAF's commitment to the UK's Reaction Forces (Air) (RF (Air)) for such periods could be expected to reach around £550 million. Given the environment of reducing resources it was clear that an alternative practice had to be found.⁷⁴

An effective and less costly method of supporting deployments was identified. This involved the development of Primer Equipment Packs (PEPs), which were simply smaller versions of FAPs. The PEPs were developed to support 10 days of operations. The reduction in the period of self sufficiency was made feasible in two ways. Firstly, the change in threat following the demise of the Warsaw Pact provided greater confidence that Lines of Communication (LOCs) could be made more secure. Secondly, measures were to be taken which would enhance the support chain. The support chain

⁷⁴ The extent of the resource pressures may be gauged by the Government guidance that Defence had to save £700 million in FY 96/97.

comprises all processing, storage and handling of materiel and encompasses production, modification and repair.

Even with the introduction of PEPs there was still going to be in a large spares bill due to shortages in current holdings, high arising rates and inadequate diagnostics facilities. This problem is to be addressed by:

- The provision of in-theatre, off-aircraft test and repair facilities for critical items and by seeking ways to accelerate the support chain, and hence reduce the requirement for excessive holdings.
- Studies to reduce transit and repair pipeline times.
- The deployment of additional facilities.
- Redeployment of personnel.
- The expeditious management of repairable items and piece part spares.⁷⁵

Implementation of MDSS will occur in three broad areas:

- The first is work that will be undertaken by support managers of those aircraft types that have a deployment role. This work will focus on the preparation of PEPs and the introduction of enhanced procedures, such as negotiating formal agreements with industry to provide necessary levels of surge during periods of crisis.
- Secondly, the development of concepts and cost benefit analyses work will be undertaken for seven specialist functional areas. These areas are manpower, Second Level Support Units (SLSU)⁷⁶, fuels, movements, weapons, Communications and Information Systems (CIS) and facilities.
- The third area of work covers those aspects that were not addressed in detail by the MDSS study and are thus less

⁷⁵ An excellent study of the management of repairable items in the RAAF context can be found in Maclean M., *Preparedness and Repairable Item Management - Linking Logistics and Air Power*, Air Power Studies Centre, RAAF Base Fairbairn, Canberra, 1994.

⁷⁶ Second level support units were created in the RAF in the 1970s to provide specialist mobile support for deployed units. RAAF equivalent units would be Mobile Air Terminal Unit (MATU) and Air Transportable Telecommunications Unit (ATTU).

well developed. These aspects include production of generic logistics plans, determining the responsibilities and interfaces between the main contributing organisations, development of a focal point concept, and arranging NATO/HNS external support.

The RAF has radically changed its logistics support concept to satisfy a set of challenges that has similarities to those facing the RAAF. The RAF is preparing to meet uncertain challenges with a greater requirement to deploy to bases with varying and uncertain support infrastructure. They have developed a concept for the support of future operations that incorporates the characteristics of flexibility, affordability, capability and sustainability.

The RAAF similarly will have the requirement to deploy to different bases, sometimes bare bases. There is, however, a greater level of certainty on where these will be and what level of infrastructure is available. The RAAF has also had more experience in developing procedures to support operations from bare bases, notwithstanding the absence of formally endorsed logistics support concepts.

FORCE-PROJECTION LOGISTICS

The US Army, like many military forces around the world, has recently been undergoing heavy restructuring and change. This change includes a different means of supporting operations that also has a relevance to Australia's circumstances. The result of the change has been a concept referred to as 'force-projection logistics'.⁷⁷

Changing strategic circumstances have resulted in the US Army changing from a 'forward presence' to a 'force projection' force. Therefore the army can no longer depend upon a defined infrastructure and detailed in-place support agreements. The new circumstances increase the requirement for logistics to be executed as the contingency develops, which increases the need for flexibility. A coordinated strategy of airlift, sealift and pre-positioned stocks (especially afloat) make the concept of force-projection a reality.

One of the developments is the recognition of the requirement for integration between the levels of war, with much less obvious lines of delineation between these levels. Joint and combined

⁷⁷ This discussion on force-projection logistics is based on Williams M.S. and Palmer H.T., 'Force-Projection Logistics', *Military Review*, June 1994, p 29.

operations⁷⁸, coupled with a US based, power-projection force defines the way that logistics is planned, resourced and executed. Power projection is inherently a joint undertaking. As such, force-projection logistics requires a commensurate degree of 'jointness'. As a theatre's wartime infrastructure develops, each service will assume responsibility for centralised management of particular categories of support.

Force-projection logistics requires a smaller, more effective support force with a minimum of duplication and redundancy of effort among the services. Entire support units may no longer be needed in a contingency, however, there will still be a requirement to introduce specific functional capabilities (eg. the materiel management function) when needed. The importance of sharing the responsibility for logistics functions with allies is also recognised.

The uncertainty about what infrastructure will be available in an area to which force is to be projected is a key consideration. The force must therefore retain the full range of logistics capabilities in order to tailor each support force to meet the contingency requirements. In Australia's case, there is a greater understanding of the infrastructure in the areas to which the RAAF is likely to be deployed in defence of Australia tasks. Of course flexibility is still critical due to the requirement to be able to deploy for a range of operations and to provide different levels of support for different types and tempos of operations.

The logistician must be capable of winning the information war and this cannot be achieved with outmoded, personnel-heavy systems which are not suited to rapid and easy deployment. Logistics had previously been designed for a specified theatre (albeit still with some inherent flexibility) but now the requirement is for force-oriented logistics. Contingency plans now call for operations which may have to be logistically supported at locations with little or no existing supporting infrastructure.

An interesting concept is one referred to as 'split-based operations'. This involves placing in-theatre only those functions which must be present. Many functions remain at their home locations from where they provide the required support. This concept is, however, limited by the availability of light weight automated equipment with assured communications. The importance of total asset visibility is recognised, with the application of microchip technology assisting in its achievement.

⁷⁸ Joint activities are those which involve elements of more than one service of the same nation. Combined activities are those involving the forces or agencies of two or more nations.

LEAN LOGISTICS

The USAF has adopted a concept of lean logistics, which may be described as a strategy aimed at improving combat capability while reducing the annual operating costs of Air Force systems. Lean logistics consists of a series of initiatives which are interrelated and are intended to promote combat capability, improve sustainability and reduce infrastructure requirements. The manner in which lean logistics is intended to change the USAF approach to the provision of logistics support is outlined at Figure 6-1.

There are a number of initiatives that together constitute lean logistics. Similar to the RAAF, the USAF switched to a Two Level Maintenance (2LM) system in late 1993. This measure has improved the USAF's operational focus, reduced costs and enhanced mobility. The USAF saved 4,430 personnel positions across the Service by removing intermediate maintenance. Equipment purchases and maintenance have also been reduced by ten per cent over the Five year Defense Plan (FYDP).

	<i>Today's Logistics</i>	<i>Lean Logistics</i>
Characteristics	<ul style="list-style-type: none"> • Big inventory • Slow/uncertain transport • Cumbersome repair system 	<ul style="list-style-type: none"> • Smaller inventory • High velocity/reliable delivery • Optimum repair flow

	<ul style="list-style-type: none"> • Static processes 	<ul style="list-style-type: none"> • Continuous improvement
Base Processes	<ul style="list-style-type: none"> • High cost • Large capital investment • Big peacetime operating stocks • Big readiness spares packages • Big footprint 	<ul style="list-style-type: none"> • Reduced investment • Lean two level maintenance • Streamlined support packages • Streamlined support packages • Light footprint
Bottom Line	<ul style="list-style-type: none"> • Big inventory drives infrastructure 	<ul style="list-style-type: none"> • Innovations streamline infrastructure

Figure 6-1: **Impacts of Lean Logistics on the USAF**⁷⁹

When 2LM was introduced into the USAF a revised system of administration involving the movement of critical spares was also introduced. Although seemingly simple in concept, the move resulted in spares entering the repair pipeline sooner and costing less to administer. The system, pioneered by the mail order industry, is one of ‘return labelling’ involving use of pre-addressed return shipment labels. Commercial express carriers in the US have the system equipment to create all shipment documentation.

Considerable savings have been achieved through revised procedures for moving repairable items between bases and depots. Previously the USAF employed a system of contract aircraft and trucks for this purpose. The new system, referred to as Door-to-Door Distribution (D3), uses commercial premium express transportation for high priority cargo, and surface transportation for routine, hazardous, oversized and classified cargo. D3 costs the USAF \$41 million per year to operate compared to the annual cost of the system it replaced of \$116 million.

Lean logistics involves a number of other initiatives. Essentially it is way of thinking about logistics that involves constant innovation. There are a number of separate initiatives that have come about due to constant change and reducing resources. There are similarities in the way the USAF and the RAAF are developing their

⁷⁹ Morrill A.B., ‘Lean Logistics: It’s Time Has Come!’, [US] *Air Force Journal of Logistics*, US Government Printing Office, Washington DC, Spring-Summer 1994, p 8. Much of the discussion on lean logistics is based on this article. At the time of writing the article, Colonel Arthur B. Morrill III, USAF was the Commander 366th Logistics Group, Mountain Home Air Force Base, Idaho.

respective logistics systems. Following a recent visit to the US, Director General Logistics - Air Force (DGLOG-AF) stated that the commonality in what the two Services were trying to achieve would make it productive for the RAAF to monitor the progress and lessons of the USAF in lean logistics.⁸⁰

CONCLUSION

Many military forces around the world have, in recent times, experienced significant changes in their size and structure. The manner in which these forces are logistically supported has also, necessarily, undergone review. It behoves Australian defence planners to critically review these overseas developments. Similarly, a review of experience gained by the forces of other nations in logistically supporting combat operations can be of great value. This Chapter has briefly reviewed selected overseas experiences in the logistics support of military forces. Whilst care must be exercised before attempting to apply lessons learned in different sets of circumstances than those likely to be faced by Australian defence planners, there is still much that can be learned by monitoring overseas developments

⁸⁰ *Report on DGLOG-AF Overseas Visit to the United States of America (August 1994)*, March 1995. Report held by Logistics Branch, Air Force Office.

CHAPTER SEVEN

A REVIEW OF DOCTRINE

Every art has its rules and maxims. One must study them: theory facilitates practice. The lifetime of one man is not long enough to enable him to acquire perfect knowledge and experience. Theory helps to supplement it, it provides youth with premature experience and makes him skilful through the mistakes of others.

Frederick the Great ⁸¹

INTRODUCTION

In common with many air forces, the RAAF, historically, has not been especially good at the formal development of air power doctrine. Without well developed doctrine the effective employment and support of air power can not be achieved to its maximum potential. Early intellectual thinking on the roles and best methods of employment of air power in an Australian context are found in the writings of Air Vice Marshal Wrigley (1892-1987) who, unlike his contemporaries, wrote on numerous aspects of air warfare. His writings have been described as a de facto expression of early Australian air power doctrine.⁸²

However, it was not until 1990, nearly 70 years after the formation of the RAAF, that the first officially endorsed air power doctrine appeared in Australia with the publication of the first edition of *The Air Power Manual* (APM)⁸³. In the foreword to that publication the then Chief of the Air Staff (CAS), Air Marshal Ray Funnell, stated:

Airmen traditionally have not responded well to the challenge of documenting their understanding of air power. In general, they have concentrated on the practical aspects of their profession at the expense of a coherent, philosophical foundation. Thus there is no

⁸¹ Quoted in Westenhoff C.M. *Military Air Power*, p 144.

⁸² Stephens A. and O'Loughlin B. (ed), *The Decisive Factor - Air Power Doctrine by Air Vice Marshal H.N. Wrigley*, Australian Government Publishing Service, Canberra, 1990, p xiii.

⁸³ RAAF DI(AF) AAP 1000, *The Air Power Manual*, (1st Ed), Air Power Studies Centre, RAAF Base Fairbairn, Canberra, 1990.

comprehensive, rational and broadly accepted theory of air warfare from which a purely national realisation of air power can be developed.

This slow evolution in understanding the importance, and in the development, of doctrine has impacted on all aspects of air power including logistics. In the logistics field there has been a great deal of highly constructive work carried out over the years which has been responsible for successful logistics support of Air Force activities. However, the lack of a formally endorsed doctrine which could provide the guidance to develop concepts, plans and procedures can result in an absence of consistent and complementary practices, and the failure to benefit from the experience of others.

There has, however, been a rapid development of modern air power doctrine around the world over the last few years. Arguably Australia has been at the forefront of this development. The establishment of the Air Power Studies Centre (APSC) at RAAF Base Fairbairn in 1989 was a catalyst for much of this activity in Australia.

Doctrine represents the fundamental philosophy concerning the employment of a defence force. As the central body of beliefs which guides the application of combat power, doctrine details what military forces should do in war, and why. Derived from a combination of fundamental principles, innovative thinking and experience, doctrine is authoritative but requires judgment in its use.⁸⁴

Doctrine is dynamic and should be subject to continual review. Before the first edition of *The Air Power Manual* was even published, the then CAS, Air Marshal Funnell, instructed the Director of the Air Power Studies Centre to develop a program for publishing the second edition.⁸⁵ Air Marshal Funnell has stated:

If we start to think in terms of doctrine being a process that should be subject to continual improvement, then I think that the flexibility that is an inherent characteristic of air power can flow through into the processes for doctrinal development.⁸⁶

⁸⁴ *The Air Power Manual*, (2nd Ed), p 27.

⁸⁵ Alan Stephens (ed), *Smaller But Larger - Conventional Air Power into the 21st Century*, Australian Government Publishing Service, 1991, p 81. This publication records the proceedings of a conference held by the RAAF in Canberra in March 1991 to commemorate the RAAF's 70th anniversary. Air Marshal Funnell said this while participating in a discussion on doctrine development.

⁸⁶ *ibid*, p 81.

Air power doctrine in Australia is, in a formal sense, only in the early stages of its development. This is not to say that *The Air Power Manual* is inadequate. Indeed, it is highly regarded within Australia and internationally as providing an excellent philosophical foundation for the employment of air power. However it is still only in its second edition, and should provide even greater utility with further iterations.

There will never be a final, definitive statement of doctrine. As stated by Air Marshal Funnell, doctrine should be viewed as a process. It will require regular adjustment with changes in technology, government policy, perceptions, threat assessments, resource availability, and experience (both our own and that of others).

Recognition of the vital role of logistics in supporting air operations is indicated in the allocation of space to the topic in *The Air Power Manual*. The topic is covered in greater detail in the second edition than the first, with a full Chapter now being devoted to logistics.⁸⁷ Although the coverage is adequate and it provides more guidance than has been available in the past, improvements could be made in providing a sharper focus.⁸⁸

Therefore, given the evolving nature of doctrine, this Chapter reviews the logistics content of Australian air power doctrine, as spelt out in *The Air Power Manual* 2nd Edition, and proposes amendments based on a view of logistics as espoused in the earlier Chapters of this study. Primarily, the proposed changes are concerned with the logistics Chapter of *The Air Power Manual*, however a change is also proposed to one other section of the doctrine publication.

This Chapter initially discusses national war making potential and proposes some amendments to Chapter One of *The Air Power Manual* and then discusses what the logistics doctrine should cover. This latter discussion reviews the existing logistics doctrine espoused in Chapter 10 of *The Air Power Manual*, assesses those areas where it is perceived to have shortfalls and suggests what aspects should be included. This discussion is used as a prelude to a proposed logistics doctrine in Chapter Eight of this study.

NATIONAL WAR MAKING POTENTIAL

⁸⁷ *The Air Power Manual*, (2nd Ed), ch 10.

⁸⁸ Not the least reason for not wishing to be too critical of existing logistics doctrine is that the author of this study was co-author of the Logistics Chapter in *The Air Power Manual*.

Chapter One of *The Air Power Manual* discusses the *War Potential of a Nation*.⁸⁹ Chapter Four of this study similarly includes a discussion on the elements that constitute *A Nation's War Making Potential*. These two discussions represent different views about what elements are considered to constitute war making potential and how they should be viewed. To a large extent this could be considered merely as different perspectives of the same theme. What is considered important in this study, however, is that *The Air Power Manual* does not discuss the essence of formulating strategies that are based on employing all elements of a nation's war making potential.

In the discussion provided in the section *National War Making Potential* in Chapter Four of this study, it was argued that there needs to be a clear and unambiguous understanding that a nation's capacity to wage war, or to undertake military operations other than war, is dependent on the full range of the elements of a nation's war making potential. We need to recognise that all of these elements overlap and interact with each other. Armed forces constitute only one of these factors. They are the final medium through which a nation exercises force, but are reliant on the other elements being appropriately geared to support them.

Within the armed forces themselves there are a number of elements which must be considered. One of these elements is the combat force. The temptation, and it is a dangerous one, is that military planners will concentrate on combat forces and add-on other considerations as they come to mind. This approach fails to recognise the interaction and interdependence of all of the elements of a nation's war making potential and hence results in a failure to achieve the maximum potential combat power.

The Air Power Manual currently discusses *Military Capability* before *The War Potential of a Nation*. It would represent a more logical flow if the war making potential of a nation (or the 'war potential', as referred to in *The Air Power Manual*) were discussed before military capability and not the reverse as is now the case. When discussing the war making potential of a nation a variety of elements are discussed one of which is the armed forces. It is through the armed forces that military capability is exercised. This would then mean the discussion was starting with the broad picture and narrowing down to the final application of combat power.

Therefore, it is recommended that the section in Chapter One of *The Air Power Manual* titled *The War Potential of A Nation* be reviewed to reflect more closely the discussion in Chapter Four of this

⁸⁹ *The Air Power Manual*, 2nd Edition, op cit pp 20-24.

study titled *Elements of A Nation's War Making Potential*. In particular the importance of military planning incorporating all of the elements needs to be emphasised. Also, changing the order of discussion in *The Air Power Manual of Military Capability and War Potential of a Nation* would provide a more logical flow.

A SUMMARY OF EXISTING LOGISTICS DOCTRINE

This section provides a summary of the existing logistics doctrine espoused in Chapter 10 of *The Air Power Manual*. The doctrine commences with a statement of the importance of logistics and then covers the following aspects:

- **Unique Features Which Characterise Air Operations.** The doctrine contends that logistics support for air operations is more complicated than that required for other types of operations due to the unique attributes of air power, which are flexibility, swiftness of application, ubiquity, range and shock. Principally, these attributes complicate logistics support in terms of the advanced technology of weapon systems, the need for timely replenishment and the siting of bases. Each of these three features - technology, timely replenishment and siting of bases - is then discussed in more detail.
- **Levels Of Conflict.** There is a brief discussion on the impact on the logistics system at different levels of conflict.
- **Training and Exercises.** The doctrine provides argument for the importance of the logistics system being validated and exercised in a realistic manner. The importance of individual training for logistics personnel to enable them to operate under combat conditions is also stressed. The requirement to provide cost effective solutions to training needs, such as combat modelling techniques, including wargaming and dynamic simulation, is also discussed.
- **Logistics Considerations.** A number of principal issues are identified. It is argued that these issues are central elements of RAAF logistics and a brief

discussion is provided on each one. These issues are identified as:

- * **Preparedness.** This section discusses the link between logistics and required preparedness levels.
- * **Organisation.** A philosophy of integrated support that provides a disciplined and iterative approach to the management and conduct of activities is argued as being necessary to satisfy weapon system preparedness requirements at minimum life cycle cost. This would be achieved by all logistics related functions being organisationally integrated and managed as one.
- * **Logistics Information Systems.** The requirement for automated systems to manage the large amounts of information that exist within the logistics systems is stressed.
- * **Requirements Determination.** It is argued that logistics support can be optimised through requirements determination, which involves determining the requirements of a weapon system on the basis of operational objectives.
- * **Engineering and Maintenance.** The importance to the support of air operations of engineering, maintenance and Battle Damage Repair (BDR) is articulated in this section.
- * **Stockholding.** The sensitivity of aircraft availability to the off-the-shelf availability of particular items is stressed. The methods of achieving stockholding for deployments are stated as being repositioning and caching and the use of Minimum Deployment Stocks (MDS) which allow deploying force elements to be self-sufficient for a specified period.
- * **Movement.** The dependence of logistics on three aspects of movement is discussed. First, the requirement for all modes of transport, including civil assets, to be considered during planning. Second, the requirement for the logistic system to be

mobile is stressed. Finally, the reliance on effective lines of communication is made clear.

- **Summary** The doctrine concludes with a summary that states that the underlying philosophy which governs the ability of the RAAF to mount and sustain air operations using allocated resources has its genesis in the links between RAAF logistics and the unique characteristics of air power. It states that from a synthesis of these characteristics, the peculiar requirements of the RAAF's logistics system, government policy, and enduring environmental conditions, specific doctrinal considerations may be derived for the most effective and enduring logistics support.

The doctrine concludes with the statement that the emphasis for these doctrinal considerations must be on simple, flexible, efficient and effective systems which are capable of supporting operational forces. To that end, the support must be comprehensive, must make effective use of available resources, and must avoid unnecessary duplication.

WHAT SHOULD LOGISTICS DOCTRINE COVER?

Overview

It is contended in this study that the existing logistics doctrine, as summarised above, does not provide the necessary level of guidance. It fails to provide a list of logistics principles and a set of desired characteristics of a logistics system that would assist those responsible for the planning and execution of logistics support for air operations.

It is argued that the aspects that should be included in RAAF logistics doctrine are:

- Introduction to Logistics Doctrine.
- Logistics Defined.
- Logistics Support in the Air Environment.
- Pervasiveness of Logistics.

- Planning for Logistics Support.
- Logistics Principles.
- Factors That Impact on Logistics Support of Air Operations.
- Summary of Doctrine.

Each of these aspects is discussed below, including the reasons why they are considered necessary. In some instances these aspects will have been dealt with in the existing doctrine. Where this occurs, comments on the adequacy of the existing doctrine are included. Building on this discussion, Chapter Eight of this study is a proposed logistics doctrine written in a format considered suitable for incorporation in *The Air Power Manual* as a new logistics doctrine Chapter.

Introduction to Logistics Doctrine

The proposed introduction to the logistics doctrine should provide a brief statement of the context of logistics as an element of military capability and should also provide an appropriate statement of the importance of logistics. Furthermore, the relationship between logistics and preparedness must be stressed.

Logistics Defined

There are support activities other than logistics that are necessary for the conduct of air operations. Further, there are differences of opinion in the international defence community on just what activities are considered to constitute logistics. It is important to specify what these activities might be.

Logistics Support in the Air Environment

In an account of logistics doctrine there should be a statement acknowledging the importance of operating and supporting operations in a joint environment. Notwithstanding the importance of joint activities, those characteristics that make air operations, and hence their support requirements, unique also need to be acknowledged.

The doctrine as espoused in *The Air Power Manual* deals with air operations by referring to the unique attributes of air power: flexibility, swiftness of application, ubiquity, range and shock. It then states that these attributes affect logistics support principally in terms of technology, timely replenishment and siting of bases. Therefore, it is reasonably well covered, however, it is argued that it is not actually the attributes of air power that affect logistics support. Rather it is certain characteristics of air power itself that make its logistics support requirements unique. These characteristics are, this study argues, technology and dependence on air bases.

The section in the existing doctrine on technology requires little amendment as it adequately outlines the impact that technology has on the provision of logistics support for air operations. However, there are some minor areas that are proposed for review. These are discussed below and incorporated in Chapter Eight.

Technological developments do not, as stated in *The Air Power Manual*, make a simplified support infrastructure possible.⁹⁰ These developments provide the opportunity to achieve greater levels of aircraft availability, but to achieve this the challenges that come with this technological development (more sophisticated and more expensive procedures, spares and training) must be overcome. Also, the improvements in equipment reliability and maintainability do not necessarily lead to reductions in maintenance requirements and the level of logistics support required, as asserted.⁹¹ Rather the overall maintenance system is made more complex, albeit more effective.

Indeed this assertion disagrees with the statement later in *The Air Power Manual*:

Increased equipment complexity generally leads to more complex maintenance arrangements.⁹²

A simplified support infrastructure may be made possible due to improved technology, but only on the flight line and certainly not for the logistics system as a whole.

The Air Power Manual lists the requirement for timely replenishment as a unique feature of air operations.⁹³ Whilst this aspect of logistics is of vital importance, it is not unique to air operations and hence has not been included in the proposed doctrine.

⁹⁰ *ibid*, p 149, para 10.4.

⁹¹ *ibid*, p 149, para 10.5.

⁹² *ibid*, p 150, para 10.6.

⁹³ *ibid*, p 150, para 10.9.

Existing doctrine discusses the siting of bases.⁹⁴ However, it is argued that the dependence on bases, rather than merely their siting, has implications for the way the logistics system is organised. This dependence on bases is due to the heavy support requirements, including logistics, that air weapon systems require.

The extent of dependence on bases differs between all forms of combat power. In the exercise of sea power, for example, ships deploy and, for a time at least, the weapon system and the base can be considered as one in the same. That is, the ship has integral maintenance, catering, supply and medical support that will sustain operations for weeks at a time. Alternatively, ground forces conduct most of their operations away from their bases. Air weapon platforms, however, always conduct operations from bases. They may deploy from their home bases, but they still require bases with a range of support services and support infrastructure. These differing levels and forms of base dependence affect the way logistics support systems need to be structured.

Pervasiveness of Logistics

The pervasiveness of logistics through every level of war (in both the planning and conduct of operations) needs to be discussed. The reason for this is that it must be readily understood that a clear and continuous flow of logistics support is the goal of logistics planning at every level. The statement on the pervasiveness of logistics in the proposed doctrine is brief and is used as a precursor to the discussion on planning. The concept of the pervasiveness of logistics is discussed in more detail in Chapter Five of this study.

Planning for Logistics Support

This Section would briefly discuss how planning should be conducted for logistics support of the Air Force. It would include discussion on Concepts of Logistics Support, organisational issues, relationship to joint logistics planning, and the requirement to obtain compatibility of doctrine, concepts, plans and procedures with other Services and nations. There would also be reference to international agreements. Discussion would of course be broad as the intention is only to provide guidance, not procedures.

⁹⁴ *ibid*, p 151, paras 10.10-10.11.

Logistics Principles

To assist commanders as well as logistics planners and practitioners in their duties, doctrine should provide a list of logistics principles. They should be prepared not as a checklist, but as a guide for analytical thinking. The principles proposed in Chapter Eight are based on principles currently adopted by the United States Air Force.⁹⁵

Factors That Impact on Logistics Support of Operations

In the proposed doctrine, factors that impact on the logistics support of operations would not be a separate section itself, but a series of brief sections that would cover those factors that are of particular importance to the provision of logistics support to air operations. They would, therefore, require careful consideration in the planning and execution of logistics support. They would be factors that those personnel responsible for the creation and sustainment of air power in Australia should carefully consider. These factors are:

- Security of Lines of Communication (LOCs).
- Asset Visibility.
- A Trained and Validated Logistics Organisation.
- A Systems Approach (View the process of support as a system, involving not just aircraft, but trained personnel, spares, fuel, runways, etc. ie. Decisions should be based on their impact on military capability - refer to Chapter Four).
- Mobility (ie. of logistics support elements rather than combat elements). This is required in the Australian context because of the requirement to deploy for most operations, especially to bare bases.
- Capability for rapid and effective transition to and from war (ie. refer to the advantages of operating in peace as in war. If for some reason this is not done then clear transition processes must be prepared).

⁹⁵ [United States] Air Force Doctrine Document (AFDD) 40, *Logistics*, Air Force Doctrine Centre, Langley Air Force Base, Virginia, 1994, p 6.

Summary of Doctrine

Logistics doctrine should conclude with a brief statement on the philosophy for the provision of logistics support in the air environment.

PRESENTATION FORMAT

This study has discussed the provision of logistics doctrine for the RAAF by continuing the current procedure of providing a Chapter for logistics in *The Air Power Manual*. Chapter Eight of this study provides a proposed doctrine in this format.

The guidance proposed could, of course, be presented in a number of ways. One way which is currently being considered is to shorten the space allocated to logistics in *The Air Power Manual* (currently seven pages), and provide the remaining guidance in logistics publications. To do so would necessitate providing this remaining guidance in a form other than doctrine. This is due to the current view that the only single Service doctrine to be provided in the RAAF is to be *The Air Power Manual*.⁹⁶

The proposed logistics doctrine at Chapter Eight does not involve a significant increase in space but focuses more on providing high level guidance than does the current doctrine. The question on how to present this guidance rests primarily on two issues. First, how is logistics viewed, and second, who needs to be familiar with logistics doctrine.

Chapter Three of this study detailed the context within which logistics operates. Basically, logistics constitutes one of the components of military capability. Without logistics there is no military capability. Logistics provides a very large portion of the preparedness which allows operations to be commenced and sustained. In an air environment, logistics constitutes a large and essential element of the RAAF's capacity to conduct each of the three air campaigns and every role of air power.⁹⁷ Given the pervasive

⁹⁶ The comments regarding a reduction in space allocation to logistics in *The Air Power Manual* and the restriction of doctrinal guidance to that publication are based on a discussion with Group Captain Gary Waters, then the Director of the Air Power Studies Centre on 6 July 1995. They represent views expressed by some officers within the RAAF, and not necessarily those of Group Captain Waters.

⁹⁷ Doctrine describes three campaigns of air power. These are control of the air, air strike and air support. An air campaign is a controlled series of related air operations aimed at achieving a single, specific, strategic result or objective. Air

nature and critical importance of logistics, the dedication of seven pages of a 243 page document outlining guidance for the exercise of air power would not seem to be excessive.

The other important consideration is who needs to have this guidance. If it is only logisticians then, notwithstanding the way logistics should be viewed, an argument could be mounted for lowering its exposure in the prime, indeed only single Service, doctrinal publication in the RAAF and providing the guidance in some form other than doctrine. However, this study has contended strongly in Chapter Three, and to a lesser extent in Chapter Four, that this is not the case.

Commanders must understand logistics. It defines the limits of their capabilities. All staff involved in acquisition, force development, planning at any level and for any purpose, and the development of operational concepts must understand whether their decisions are logistically feasible. They must understand the logistics implications of their decisions. Whilst there is always access to specialist staff, an air force officer of any specialisation and at any rank level who does not have, at the very least, a basic understanding of logistics cannot be considered to have a balanced understanding of what constitutes military capability and hence how to best prepare for, plan for, or exercise air power.

Staff seeking doctrinal guidance, as distinct from detailed procedures, will go to *The Air Power Manual*, and it is fanciful thinking that officers other than logisticians will often seek this basic, albeit critically important, logistics guidance anywhere other than the prime doctrine publication.

CONCLUSION

There is a clear and accepted requirement for military forces to spell out the fundamental philosophy concerning their employment. This guidance, in the form of doctrine, assists in understanding ‘the how, what and why’ of the application of combat power. The RAAF has made significant advances in the development of air power doctrine over the last few years and now has a very effective doctrinal base on which to provide air power in the defence of Australia and for other tasks that may arise. Very importantly, the RAAF also developed this doctrine in a manner that meant it would be

roles encompass the actual conduct of combat. There is a large range of air roles but they are covered by the four broad headings of counter air, strike and interdiction, anti-surface and force enhancement. (*The Air Power Manual*, (2nd Ed), p 48, paras 3.75 - 3.76).

viewed as a process and hence would not lose its relevance with changing circumstances.

As part of this continuing development process, this Chapter proposes changes to logistics doctrine. The existing doctrine has provided a level of guidance that had not existed before and has achieved a great deal. The proposed doctrine has a slightly altered focus in attempting to provide broad guidance on what logistics means to the provision of air power and in providing a set of principles and desired characteristics of an effective logistics system for the provision of air power in Australia.

This guidance has been prepared in such a manner as to be of assistance to staff involved in a large range of activities. Given this, and the nature of logistics as a component of military capability, it is argued that this doctrine should be presented as a part of *The Air Power Manual*.

CHAPTER EIGHT

A PROPOSED LOGISTICS DOCTRINE ⁹⁸

When the enemy assesses our forces, he values only those forces which the logistics community has ready for combat, or can get ready in time, and then sustain for a requisite period of time.

General F.M. Rogers ⁹⁹

INTRODUCTION

What is Logistics?

Logistics forms an essential component of Australia's military capability. In a military environment, logistics is based on the achievement of preparedness. Adequate logistics planning and execution will permit forces to be able to conduct operations when required and continue those operations for as long as required. The specific functions of logistics may be conveniently divided into the four categories as shown in Table 8-1.

MATERIEL	PERSONNEL	SERVICES	FACILITIES
<ul style="list-style-type: none">• Design and development• Acquisition• Storage• Movement• Distribution• Maintenance• Evacuation• Disposition	<ul style="list-style-type: none">• Movement• Hospitalisation• Evacuation	<ul style="list-style-type: none">• Acquisition or furnishing	<ul style="list-style-type: none">• Acquisition or construction• Maintenance• Operation• Disposition

Table 8-1: **Logistics Functions**

⁹⁸ This Chapter provides a proposed RAAF logistics doctrine. As written it is intended to replace the current logistics chapter in *The Air Power Manual* and should be read in that context. The reasoning behind this proposed doctrine is espoused in Chapter Seven, using the earlier Chapters, in particular Chapters Four and Five, as a basis for viewing logistics in the air environment.

⁹⁹Quoted in Westenhoff C.M., *Military Air Power*, p 136. General Felix M. Rogers was a WWII ace with twelve victories.

LOGISTICS SUPPORT IN THE AIR ENVIRONMENT

General

Operations that will be conducted by the ADF will almost certainly be joint in nature. Therefore, it is necessary to ensure that the operational and support doctrine, concepts and procedures of the three Services are complementary. In terms of logistics this will enable support to the whole force to be provided in a more effective manner. There are, however, differences in the way that forces in the three environments, sea, land and air operate and this subsequently creates differences, primarily in emphasis, in the way logistics support of the three forms of combat power is conducted. There are a number of characteristics of air power which make its support requirements unique.

Technology

Increasingly rapid advances in military technology have had a large impact on all forms of combat power, but none more so than air power. Enormous amounts of logistics resources, measured in terms of both quantities and value, must be provided for modern air weapon systems to be made ready to conduct and sustain operations.

Compared to their predecessors, modern aircraft are now able to perform a greater variety of roles, switch from one role to another more quickly, achieve far greater levels of accuracy and maintain much higher availability rates. Improvements in system redundancy allow aircraft to continue operating with unserviceabilities or battle damage, and greater modularisation permits more rapid turnaround of aircraft with damaged or failed systems. Initially this would appear to make the logistics task seem easier in that higher levels of availability may be achieved. However, the increased technology that permits this to be achieved brings its own challenges.

Modern weapon systems permit simpler and more rapid maintenance activity on the flight line and at deployed locations, but the overall maintenance organisation becomes more complex and costly. There is a requirement for more sophisticated and costly fault finding systems, and test and calibration equipment and skills. This will normally confine comprehensive maintenance support to centralised repair facilities located well away from forward bases, and in some cases overseas.

The location of the comprehensive maintenance support activities in areas away from the operating aircraft, results in a longer logistics pipeline with a large number of high value items in it. Coupled with the exceptionally high cost of many of these items, which inevitably leads to a reduced number in the inventory, the importance of efficient pipeline operation becomes critical. Security of the pipeline is also essential as the loss of even a small number of these items may have serious implications.

Logistics activities associated with modern air weapon systems require sophisticated methods of storing and transmitting technical data. The use of technical data in electronic form has the potential for streamlining logistics processes. It also has major implications for information systems, which need to have the capacity and the functionality to undertake a broad range of associated activities. Finally, the quality of technical data and the availability of information systems will have an effect on the quantity of physical resources (such as technical manuals) required to support aircraft operations and the quality of the logistic support provided.

Dependence on Bases

Whilst all forms of combat power have a dependence on bases, the form and extent of that dependence varies. In exercising sea power, ships can deploy and operate for a limited period, utilising their own integral base support resources (maintenance, catering, supply, medical services, etc.). The length of time that the ship may continue operations before it must return to its base can be extended if specialist support ships with greater maintenance and supply capabilities are also operating in its vicinity. Land power is exercised primarily away from its bases. Land forces normally deploy and move regularly, and take significant levels of their required support with them. Air weapon platforms must always launch their operations from air bases.

This dependence applies to all types of aircraft, including helicopters and Vertical and Short Take-Off and Landing (VSTOL) aircraft. While these aircraft can operate on short runways or without runways at all, they are still dependent on support activities such as repair and maintenance, catering, refuelling, rearming, command and control, intelligence, ground defence and communications. Even ship-borne aircraft may be said to be operating from a base as these support activities are provided by the ship/base. The problems associated with dependence on bases can, to some extent, be reduced by various measures such as active and passive defence measures, mobility of support services and air-to-air refuelling.

The RAAF groups air bases into three categories, Main Operating Bases (MOBs), bare bases and Forward Operating Bases (FOBs). MOBs are established bases providing a wide range of support infrastructure and services. By the year 2000 the RAAF will have three northern bare bases which will normally be staffed by caretaker personnel and which will have basic infrastructure and facilities. Bare bases are activated for exercises and operations. Any airfield, including small, poorly developed civil airfields, can be designated as a FOB depending on operational requirements.

The large extent of the dependence of air power on bases is spelled out in Chapter 3, paragraphs 3.39 - 3.40, and the manner in which the RAAF structures its support organisation to satisfy this dependence is outlined at Chapter 4, paragraphs 4.34 - 4.37.¹⁰⁰

THE PERVASIVENESS OF LOGISTICS

Logistics considerations impact at every level in both the planning for and the conduct of operations. This applies regardless of the type or size of operation. Every military plan and concept is dependent upon logistics. The pervasiveness of logistics creates a requirement to ensure that logistics support flows from the initial suppliers of goods and services, whether military or civilian, through to the forces involved in the final delivery of combat power without interruption. Additional logistics support will enter this flow at every level. Planning for logistics support must, therefore, be consistent and complementary at all levels.

PLANNING FOR LOGISTICS SUPPORT

The pervasive nature of logistics leads to a requirement for planning at all levels; strategic, operational and tactical, to be structured so as to provide continuous, consistent and complementary logistics support. This is essential to ensure that all requirements are considered, the support is provided when and where required, and duplication is avoided.

Whilst clear dividing lines between the three levels of planning are not possible, and indeed such a division may work against achieving a continuous flow of support, it is imperative that the extent of the responsibilities of planning staffs at each level be clearly understood. This is to ensure that the extent of overlap

¹⁰⁰ As this text is being written as a proposed Chapter for *The Air Power Manual* these references do not refer to other sections of this study but to *The Air Power Manual* itself.

between the levels does not become too large. This could lead to duplication, confusion as to where responsibilities actually lie and a loss of flexibility at the tactical level, as any intrusion between the levels invariably occurs downwards from the strategic to the tactical level.

Consistency and complementarity should also apply between the Services. Whilst each Service has unique characteristics that require variations in approach, these should be kept to a minimum. Further, where feasible, avoidance of duplication can aid attempts to achieve economy with measures such as Single Service Logistics Management (SSLM)¹⁰¹. Similarly, attempts should be made where practicable, to ensure compatibility with the doctrine, concepts, plans and procedures of nations with whom combined operations are likely.

LOGISTICS PRINCIPLES

General

The following set of logistics principles are intended to provide guidance to commanders and those personnel responsible for the planning and execution of logistics support. The principles are not unique to logistics, nor will each of them carry the same weight in every situation. They will, however, provide a useful guide, as each principle represents an attribute that would be desirable in all aspects of logistics. They have applicability, to various degrees, for all logistics functions and at all levels. The two components of preparedness; readiness and sustainability, are not listed as principles as they are an aim. Logistics is all about achieving the requisite levels of preparedness. Table 8-2 summarises the principles which are then discussed in greater detail in the subsequent text.

RESPONSIVENESS	Getting the right things in the right amount to the right place at the right time.
SIMPLICITY	Keep it simple.
FLEXIBILITY	Be able to operate in any environment and adapt to

¹⁰¹ Single Service Logistics Management is where one of the Services provides the prime management responsibility for the provision of a logistics supply item or service used by two or all of the Services.

	changing circumstances.
ECONOMY	Maintain an appropriate balance between resource usage and resource conservation.
ATTAINABILITY	Know what you can and must do.
SURVIVABILITY	Survive to prevail.

Table 8-2: **Logistics Principles**

Responsiveness

Responsiveness is a vital principle of logistics, whether in support of operations or otherwise. The logistics system, to be effective, must be capable of locating, acquiring and moving the required resources in the required timescale. To achieve this, the availability of timely and accurate information is a prerequisite. Related to this is the necessity for access to secure and responsive communications, especially during the preparation for and conduct of specific combat operations. This principle is ubiquitous and should apply for all logistics processes from acquisition to the support of weapon systems in operations.

Simplicity

The applicability of this principle commences during the acquisition process. By considering weapon system characteristics such as reliability, maintainability, deployability, survivability, standardisation and interoperability we help to create an environment where logistics support will be simpler and more cost effective during operations.

Consistency of procedures and planning practices between the Services and allies also removes unnecessary complexities which could lead to confusion and duplication. Organisational structures can also assist in the achievement of simplicity. For example, the adoption in the RAAF of a two level maintenance system over the previous three level system has eliminated an intermediate stage and resulted in more streamlined maintenance.

Flexibility

A logistics system that does not adopt flexibility as one of its chief characteristics will inevitably fail to meet the numerous and unpredictable challenges that are inherent in military operations. Logistics must be structured in such a way that it can support

operations conducted in Australia from home bases, deployed established bases, deployed bare bases or locations around the world (eg. support of United Nations missions or similar operations). It must be capable of supporting operations when required (readiness), sustaining those operations at greatly increased rates of effort (ROFE) and rapid expansion.

This principle is closely related to the principle of simplicity. To be flexible, simplicity is necessary to enable rapid adaptability to changing locations, tempos and requirements. It is also dependent on mobility. Support organisations and resources must be capable of deployment within designated timescales.

Economy

When conducting operations it is a goal to attain the proper balance between the principles of concentration of force and economy of force. These principles of war seek to apply sufficient air power to achieve a military objective while conserving resources for future use. To accomplish this, commanders selectively employ forces to exploit enemy weaknesses and avoid enemy strengths. A balance between resource use and resource conservation allows the support structure to meet the needs of the commander.

In day-to-day activities economy is important to ensure the maximum utilisation of often scarce resources and to meet obligations for the appropriate expenditure of public monies. Also, it should not be assumed that in combat operations the requirement for economy will dissipate, however, economy will be important more to the extent that it contributes to the military capability of the force involved.

Effective investment and planning in logistics support areas can greatly improve the ability of the system to effectively support air operations in an economical manner. The logistics system aims to achieve the maximum possible military capability from the existing force structure.

Attainability

The planning and execution of any military operation requires a clear and concise objective. The objective of the logistics system must be to provide commanders with the greatest possible freedom to deploy, employ, and sustain their forces. That is, it is logistics that provides the substance to the flexibility that every

commander wants to possess. The principle of attainability applies to all logistics activities and has three requirements:

- Ensure that everyone understands the objective
- Provide adequate resources to attain the objective.
- Never let anyone lose sight of the objective.

Survivability

Commanders should keep in mind that one side's logistics system may be their adversary's strategy. That is, the enemy may intentionally strike at your logistics centres of gravity. The military capability of your own forces can be severely weakened or neutralised if the logistics system is not capable of survival. The intensity and destructiveness of modern warfare can create a difficult and uncertain environment and it is imperative that survivability considerations be given to all aspects of logistics planning and execution. Survivability of the logistics support structure can be enhanced by eliminating or minimising limitations created by vulnerability, capacity and visibility.

REQUIRED CHARACTERISTICS OF THE LOGISTICS SYSTEM

General

There are certain characteristics that are essential in a logistics system that is required to support air operations. Most of these characteristics are necessary for the support of day-to-day activities, whilst others are primarily designed to support combat operations. Therefore care must be taken when taking decisions on the structure of the logistics system during times of peace that the system does not become optimised for the support of day-to-day activities (which includes scheduled exercises). It will often be necessary to conduct logistics activities in a manner that, in a strictly commercial or business sense, is inefficient, but which is necessary to provide an acceptable state of preparedness for combat operations. These are not the only characteristics that an efficient logistics system should possess, but they are considered fundamental to an adequate support structure and should be incorporated into logistics support concepts, policies and plans.

Security of Lines of Communications

The heavy dependence that air power has on base support and the huge quantity of resources that would be consumed by air elements conducting combat operations makes the security of Lines of Communication (LOCs) into bases of paramount importance. Successful interdiction of these LOCs to a significant extent would strangle the ability to sustain operations very quickly. This characteristic is associated with the principle of survivability.

Although an adversary may not know exactly which operations will be conducted from which bases, the relatively limited number of bases in Australia from which an adversary could reasonably anticipate operations to be conducted, makes the LOCs supporting these operations to some extent predictable.

In the Australian context there are a series of factors that would make a break in the pipeline between the air weapon systems and the source of their supporting resources potentially catastrophic. These are:

- Small numbers of weapon platforms (making high serviceability rates critical).
- High levels of technology (making supply and maintenance procedures more complex and more costly).
- Tight defence budgets (reducing inventory levels and increasing the impact of stores lost to interdiction).

Asset Visibility

Achievement of the principle of responsiveness can be greatly assisted by having total asset visibility. In peace and war an accurate knowledge of the condition, quantity and location of assets is hugely important. More logistics problems can be identified and resolved at lower levels if total asset visibility is a feature of the system. In combat operations however, if there is a large and sudden increase in the ROFE, there will be a commensurate large and sudden increase in the size and complexity of the demand, movement, issue, receipt and storage activities. This will make the maintenance of total asset visibility much more difficult at the same time as it has become much more important. It is therefore vital that information and communication systems be designed that can function effectively in a modern combat environment.

A Trained and Validated Logistics Organisation

The logistics organisation for the purpose of this discussion is taken to mean all of those elements involved in the logistics support of the force. This includes personnel, infrastructure, guidance (in the forms of doctrine, support concepts, policy and procedures), asset holdings, supporting systems (eg information and communication systems), the training and exercise regime, and the system of performance measurement and evaluation.

It is essential that an appropriate basis for the measurement of the capability of the logistics system be achieved. It is a false comfort to be pleased with the system because demand satisfaction rates are high and there are good levels of cost effectiveness during day-to-day activities.

The training that personnel receive and the way the whole logistics organisation is exercised is critical to the success of the logistics organisation and hence the success of the RAAF in operations. The training focus must be on the support of operations and exercises must adequately test the capacity of the organisation to provide the required preparedness levels. Logistics must not merely provide support to exercises, but must itself be exercised and validated. To provide the requisite logistics support for an air exercise programmed one year in advance does not test readiness, nor does the short duration of most exercises adequately address the numerous issues involved in providing sustainability to a combat force.

A Systems Approach

In planning for, and providing, logistics support to operations, the whole system must be considered. Decisions should not be made on individual aspects without consideration of their impact on the whole system and therefore military capability. For example, a decision might be taken to increase the level of aircraft maintenance provided to a forward deployed location. However, this would also result in an increase in the accommodation and catering demands of the forward base, in turn increasing again the manning requirements. It would also increase the value of assets that must be defended from ground threat and increase the complexity of the lines of communication, due to higher levels of spares that must be moved forward.

Mobility

Aircraft themselves are inherently deployable. They are, however, of little value (even as a deterrent) without the supporting infrastructure of a base. In an Australian context, air operations will most likely be conducted from deployed locations, at times from bare bases which do not have running support systems in place. This necessitates the establishment of a logistics support system that is itself mobile.

Mobility is related to the factor discussed earlier about a systems approach. Deployable units, such as No. 1 Operational Support Unit (1 OSU) and Air Transportable Telecommunications Unit (ATTU), greatly assist in allowing base support infrastructure to be quickly established where required. It is, however, the whole system must be optimised to support deployed operations. Plans must be in place for lines of communication to be quickly established and maintained to enable sustainment of operations from the deployed location once it is established.

Ability To Efficiently Transition To and From War

The ability of the logistics system to transition from the support of peace-time activities to the support of combat operations is of vital importance. This transition will take place at a time when workloads are rapidly increasing and the pressure on personnel is high. There will not be the luxury of lengthy settling in periods whilst teething problems are resolved. The penalties for mistakes during the transition period may be severe.

The critical issue is to minimise the range of transition practices required. The activities that the logistics organisation

performs during peace should reflect, as far as is practicable, the manner in which they will be performed during combat operations. Procedures and information systems should not vary much and personnel should be trained to support combat operations.

The whole logistics organisation should be focussed on the support of combat operations, with the support of day-to-day activities being considered a period of training and consolidation. It is a potential trap for military forces that have not engaged in combat for some time to allow the focus to swing towards optimising the support organisation towards day-to-day peacetime activities.

Activities that, for good reason, are to be performed differently during peace must be identified. They must then have clear transition procedures developed and regularly validated.

The reverse transition from war to peace is also important. Planning must ensure that it occurs in a manner that will minimise damage to, or loss of, equipment. Further, the logistics system must be returned to its capacity to support required preparedness levels for future possible operations as quickly as possible. The major challenge with this reverse transition is countering the 'wind down' effect that accompanies the cessation of hostilities.

SUMMARY

Logistics must be viewed as a component of military capability with its primary purpose being the achievement of preparedness. The adequate achievement of these required levels of preparedness are best achieved by following a set of logistics principles that have been developed through experience and research and by building certain desirable characteristics into the logistics system. Although the actual logistics requirements of any given operation will be as varied as the number of possible operational scenarios that exist, adherence to these principles and logistics system characteristics will enable the logistics organisation to meet any likely challenges.

CHAPTER NINE

THE STATUS OF LOGISTICS SUPPORT CONCEPTS

Field Marshal Kesselring, the German Commander-in-Chief in Italy, and Rommel disagreed on many aspects of the North African campaign. They did agree, however, after it was over, that it was primarily a logistics battle and that their promising opportunity for decisive victory evaporated because transportation had been badly planned and clear organisational channels for logistics support had never been established.

Major General Jonas L. Blank¹⁰²

INTRODUCTION

Until recently there has been no formally endorsed concept for the logistics support of air operations at any of the levels of war, strategic, operational and tactical. Recent work has been conducted at each of the three levels to provide the necessary concepts. This Chapter will review the current status of work that has been carried out on logistics support concepts and suggest areas for further development. Chapter Ten will then propose a way ahead for this development. As any operations that the ADF will become involved in will almost certainly be joint in nature, it is also necessary to review the status of logistics support concepts within Headquarters Australian Defence Force (HQADF).

STRATEGIC LEVEL CONCEPTS

Background

At the Chief of the Air Staff Strategic Planning Conference held in December 1994, one of the twelve key issues discussed was the requirement strategic level logistics support concepts.¹⁰³ The Conference directed that a paper be presented to Chief of the Air Staff

¹⁰²Quoted from Ruttenberg D.C. and Allen J.S. (ed), *The Logistics of Waging War*, p 86.

¹⁰³ 'Development of Strategic Level Logistics Support Concepts', Key Issue Paper No 7 in *Chief of the Air Staff Strategic Planning Conference*, 1995.

Advisory Committee (CASAC) on how best to satisfy this requirement. At the time of writing this study the development of a strategic level concept was continuing. The following section provides an outline of the draft concept as it was in October 1995.

The Draft Concept in Summary

The Strategic Concept for Logistics commences with an introduction which discusses the problems associated with the absence of a logistics support concept at the strategic level and states what it will achieve. The following aspects are then covered:

- **Aim.** The aim of the concept is the documentation of the principles and imperatives underpinning RAAF logistics, while explaining how the RAAF intends to provide logistics support to air operations.
- **Scope.** The concept was developed within the context of air operations in a single Service and joint environment and is in two parts:
 - * **RAAF Concept of Logistics.** This part identifies logistics support imperatives, defines the RAAF logistics function, defines the RAAF engineering, maintenance and supply philosophies for providing logistics support to operations and examines the principles and imperatives underpinning logistics support to RAAF peacetime and contingency operations.
 - * **RAAF Concept for Logistics Support of Operations.** This part defines the unique and required characteristics of logistics support to air operations, outlines joint and RAAF logistics command and control responsibilities and arrangements and explains the organisation, structure and delivery of RAAF logistics support to operations at the strategic, operational and tactical levels.
- **The Strategic Environment.** This section provides background on strategic level guidance, the strategic environment and logistics imperatives.
- **Basis for Planning.** Discussion is provided on military capability and its relationship with strategic guidance.

- **Force Structure.** This one paragraph section briefly explains what force structure is and how it relates to preparedness.
- **Preparedness.** This section provides a summary of ADF preparedness doctrine.
- **Conceptual Framework for RAAF Logistics.** This section discusses a conceptual framework which had been developed to provide a means for defining the scope, boundaries and major activities conducted by the RAAF logistics organisation.
- **Engineering, Maintenance and Supply.** There are separate sections describing the RAAF philosophies on each of the major activities of logistics, engineering, maintenance and supply.
- **Logistics Principles.** A set of logistics principles are provided.
- **Characteristics of Logistics Support for Air Operations.** There is discussion of those aspects that make the provision of logistics support to air power unique and a set of required characteristics of a logistics support system for air operations.
- **Joint Logistics Command and Control.** ADF joint doctrine command arrangements at each of the three levels are discussed.
- **RAAF Logistics Command and Control.** The existing RAAF command organisation is described.
- **Levels of Logistics Support.** Discussion is provided on the logistics activities that take place at each level of war.

The draft strategic concept for logistics is a document which explains the existing organisation and activities undertaken in the provision of logistics support for the RAAF.

OPERATIONAL LEVEL CONCEPTS

Background

The requirement for the provision of logistics support concepts at the operational level has been accepted and work on these commenced at Air Headquarters (AHQ) in 1994. The approach taken has been to develop separate concepts for each Force Element Group (FEG) with separate concepts for the associated Air Base Wings (ABWs) and Contingency ABWs. Whilst there is a great deal of commonality in the way logistics support would be provided to force elements from each FEG, the differences that did exist were considered to be sufficient to warrant different FEG concepts. At the time of preparing this study there had not been a final decision on whether to prepare an overarching operational level concept.

The concepts are to be focussed on the provision of logistics support to contingency operations. Development of the logistics support concept for Tactical Fighter Group (TFG) is the most advanced and is to be used as a template for the further development of concepts for the other FEGs. Development work on the concept for ABWs has not yet commenced.

The Tactical Fighter Group Concept in Summary

At the time of writing this study the TFG logistics support concept was still under development and, therefore, this summary is only a general indication of the structure of the concept. After an introduction stating the purpose of the concept, the following aspects will be covered:

- **Assumptions.** Some planning assumptions are made.
- **Organisation.** This section will discuss such aspects as organisational roles, including command and control issues and functional logistics delivery arrangements, which will involve consideration of the relationship between the logistics support functions performed at the Forward Operating Bases (FOBs), Main Operating Bases (MOBs) and the TFG home base at RAAF Base Williamtown.¹⁰⁴
- **Logistics Information Systems.** This area is yet to be developed.
- **Maintenance Support.** This section will cover a range of activities including:

¹⁰⁴ Any airfield, including small, poorly developed civil airfields, can be designated as a Forward Operating Base (FOB) depending on operational requirements. Main Operating Bases (MOBs) are established bases providing a wide range of support infrastructure and facilities provided. The TFG home base at Williamtown is a MOB.

- * Maintenance support philosophy.
- * Division of maintenance support responsibilities.
- * Deployment of maintenance personnel.
- * Deployment of maintenance equipment.
- * Industry support.
- * Contingency Maintenance.
- * Battle Damage Repair (BDR).
- * Damaged aircraft recovery.
- **Stockholding.** Whilst still being developed, this section will discuss such aspects as Minimum Deployment Stocks (MDS), Repairable Items (RIs), and prepositioning and caching.
- **Movement.** Tactical and strategic modes of transport and Lines of Communication (LOCs) will be covered in this section.

TACTICAL LEVEL CONCEPTS

The tactical level is where the results of the operations logistics efforts at all levels are manifested.¹⁰⁵ At this level the manner in which the concepts for logistics support are specified varies. They may be written as concepts or as Standard Operating Procedures (SOPs). Performance of logistics support at the tactical level has been successful in the RAAF. Whilst problems have inevitably occurred on exercises, there have been no ‘showstoppers’¹⁰⁶ although potential ‘showstoppers’ have been identified in classified Post Exercise Reports (PXR).

¹⁰⁵ Here the definition of ‘operations logistics’ is that proposed and explained in Chapter Five. That definition is ‘Operations logistics encompasses all logistics functions, or elements thereof, which are required to generate or sustain specific operations.’ Whilst Chapter Five explains this in greater detail, the essential point here is that operations logistics functions are performed at all levels of war, but the results of all operations logistics functions are manifested at the tactical level.

¹⁰⁶ Although not officially defined, the term ‘showstopper’ is generally accepted within the RAAF as being a problem, of any nature, that will stop the operation from proceeding.

Without the benefit of higher level concepts to provide guidance Headquarters Operational Support Group (HQOSG) has carried out considerable work on the development of a tactical level logistics support concept. Whilst yet to receive endorsement, OSG has developed a concept of operations that provides guidance on the establishment of bare bases and Point of Entry (POE) airfields.

A JOINT CONCEPT FOR LOGISTICS SUPPORT

At present there is no joint concept for the logistics support of operations. Joint doctrine covers preparation of such concepts on the basis of contingencies as they arise. Current joint doctrine outlines the procedures for the development of logistics concepts that will support the endorsed strategic operations concepts.¹⁰⁷ This function is performed by the Administrative Planning Group (APG). The membership of the APG is flexible depending on the circumstances, but is chaired by the Director of Joint Logistics, Operations and Plans and may comprise of representatives of:

- Service offices logistics divisions or branches.
- Joint Movement and Transport Branch of Logistics Division.
- Surgeon General ADF Division.
- Legal Branch of Human Resources and Management Division.
- Logistics Policy Branch of Logistics Division.
- Services Conditions Branch of Personnel Division.
- Defence Force Plans and Programs Branch of Development Division.
- Resources and Financial Programs Division.

¹⁰⁷ ADFP20, *Logistics in Support of Joint Operations*, Director Publishing, Department of Defence, Defence Centre, Canberra, 1995, p 3-1.

One possibility is for the development of a support concept embracing several aspects of support.¹⁰⁸ This concept may be based on the primary support roles as listed in *Strategic Review 1993*.¹⁰⁹ These primary support roles relate to the provision of:

- Command, control and communications.
- Training.
- Logistics support.
- Transport.
- Infrastructure.
- Industry support.

SUGGESTED FURTHER DEVELOPMENT

A Starting Point

Until 1994 the absence of endorsed logistics support concepts in the RAAF had worked against the establishment of a clear, consistent approach to the provision of logistics support to air operations. The recent rapid and productive concept development activity can only improve the ability of the logistics community to provide the requisite support.

Like doctrine, concepts, both operational and support, must be considered to be dynamic in nature and as such they should be the subject of regular review. Changes in any of the many factors that input into the development of concepts, such as strategic guidance, technology, resource availability, changing force structure, changed perceptions and experience will result in the requirement to review our concepts.

The RAAF does not yet have a fully developed structure of logistics support concepts that can provide the necessary guidance to those personnel that are required to provide the necessary support to operations. Work since 1994 has done a great deal to satisfy this deficiency and has provided an excellent starting point for further development.

¹⁰⁸ Based on discussion with Wing Commander Paul Robey, Logistics Division, HQADF, October 1995.

¹⁰⁹ *Strategic Review 1993*, p 46, para 5.33.

A Framework of Support Concepts

To date, all work on logistics support concepts, whilst productive, has been uncoordinated. The next Chapter argues that further development of logistics support concepts should be conducted within an endorsed framework. This framework needs to be endorsed at the most senior level and should provide a basis for the development of concepts at each of the levels of war. This would provide a common understanding of what is required to provide a consistent and complementary flow of logistics support to the point where it is needed.

The proposed framework needs to describe those factors which are common to logistics planners at all levels, define the different levels, and specify what logistics support concepts are required and who should be responsible for their preparation. The framework needs to be consistent with doctrine and whilst being specific to the support of air operations it also needs to recognise the joint nature of modern military operations.

This framework should be detailed in the strategic level concept. The strategic level concept currently being developed provides a description of the logistics system as it is at present, rather than providing guidance on the way logistics support should be provided. It also covers a great deal of subject material that is not appropriate for this type of document. Some of the content of the document could clearly be described as doctrinal in nature. These areas include discussion of logistics principles and required characteristics of a logistics system. Whilst it is entirely reasonable to discuss these aspects in concepts, they provide a higher level of guidance that more appropriately fits into doctrine. This aspect is discussed in greater detail in Chapter Seven.

Chapter Ten proposes a means of developing a framework of logistics support concepts that can guide further development work and assist in the provision of appropriate guidance to those responsible for the planning and execution of logistics support at each of the levels of war.

CHAPTER TEN

PROPOSED DEVELOPMENT OF LOGISTICS SUPPORT CONCEPTS

Logistics plans are so vital - so ambient - so all-pervasive, that they can be considered to be the common denominator of all plans. If any military plan is to be realistic, logistic considerations and logistic plans must be interwoven with national, strategic, and tactical plans at all levels of command.

Rear Admiral Henry E. Eccles, USN Ret'd.¹¹⁰

INTRODUCTION

The ADF and the RAAF have always worked on the development and refinement of operational concepts and these operational concepts have included some consideration of logistics aspects in varying degrees of detail. However, at present there is inadequate guidance for the continued development of logistics as a unified system of support. That is, logistics, as stressed earlier in this study, needs to be viewed as a single system of support which flows from the national support base through to the final application of air power. Therefore, there needs to be a coordinated framework for developing logistics support concepts at each of the levels of war. While there is a great deal of activity being carried out on the development of logistics support concepts both at the joint and RAAF levels, development of an overall conceptual framework of logistics support would help integrate this development work.

In Chapter Four a distinction was made between an operational focus and a focus on operations. The former is what the Air Force should be striving for, with all activity being focussed towards the preparation for, and conduct or sustainment of, air operations, either directly or indirectly, in the short or long term. The latter focus, that is on operations, has been regarded by this study as a potential pitfall which can hinder the operational capability of the force. This latter focus occurs when the emphasis is weighted too heavily on operations alone. In the context of this Chapter, this occurs when concepts are prepared that concentrate exclusively or

¹¹⁰ Eccles H.E., *Logistics in the National Defense*, p 59.

largely on operational aspects, with insufficient consideration being given to support aspects.

At all levels however, there has been a great deal of activity in the preparation of the required logistics support for operations and work on logistics support concepts is developing rapidly. This Chapter will propose a framework for the further development of these concepts.

The existence of an endorsed framework of logistics support concepts would assist the RAAF activities in a number of areas. It would provide:

- A coordinated and consistent approach to the delivery of logistics support to air operations, without undue overlap or duplication between the levels of war.
- A basis for the determination and allocation of resources.
- A guide for the development of properly focussed logistics training and exercise activity.
- The provision of adequate guidance from the strategic down to the tactical level.
- An improved basis from which to effectively integrate operational and logistics planning.
- An improved understanding of the system-wide logistics support requirements of air operations that will enhance the RAAF's ability to operate in a joint environment and assist in the development of joint logistics support concepts.

In Chapters Four and Five of this study there was discussion on the notions of operations logistics support to air operations and the pervasiveness of logistics. If these two notions are accepted it should be evident that operations logistics considerations are not the sole province of planning at any one level of war. That is, whilst the results of operations logistics planning and activity are most readily manifested at the tactical level, it requires consistent and complementary planning, and activity at every level to ensure that adequate levels of logistics support are delivered in a timely and cost-effective manner.

This study argues that there is a requirement to develop a framework of logistics support concepts. This is to ensure that there is a comprehensive coverage of all logistics aspects, to avoid

duplication and to ensure that there is a consistent and complementary approach taken at all levels. Logistics activities, including planning, for operations are required at every level (pervasiveness) and there are no clear lines delineating the levels. It is important that the RAAF undertakes this development of a framework of logistics support concepts in a manner consistent with the requirements of conducting operations in a joint environment. The development of joint logistics support concepts are not well advanced and the RAAF could contribute productively to this development work.

A major challenge in developing logistics support concepts at the various levels is to ensure a smooth continuous flow of logistics support to the tactical level of operations without the overlap between the levels becoming too large. The development of too large an overlap between the levels, which invariably occurs downwards from the strategic level, will inevitably result in duplication of effort, confusion and loss of flexibility at the tactical level. The reason for the potential overlap downwards is that staff have a tendency to concentrate on those aspects with which they are most familiar.

A FRAMEWORK OF LOGISTICS SUPPORT CONCEPTS

General

Different staffs employed at different locations, all trying to achieve the same goal makes the integration and coordination of logistics activities through the strategic, operational and tactical levels a major challenge. It is nonetheless important that logistics support concepts that are prepared at each level fit into an endorsed framework to ensure the continuous flow of logistics that is so vital to the successful support of operations. There are a number of considerations in the development of such a framework and these are discussed in this Section. A framework of logistics support concepts needs to be developed in accordance with endorsed doctrine. Chapter Eight proposed a logistics doctrine for air operations and discussion in this Chapter is consistent with that proposed doctrine.

The framework would define the different levels, strategic, operational and tactical, and specify what logistics support concepts are required and who should be responsible for them. The framework needs to be consistent with doctrine and reflect the joint environment in which future operations will almost certainly be conducted. The development of a framework would remove the necessity of repeating information at the beginning of each concept that is common to all concepts. The framework would be best placed within, and form part of, the strategic level concept.

Figure 10-1 is a diagrammatic representation of a framework of logistics support concepts. At each level is a set of logistics support concepts rather than just one concept. This Chapter discusses these concepts in greater detail in the Section *What Concepts are Needed?*. The overlap between the levels is indicated and the concepts are shown set in a framework that ensures a common set of objectives. Whilst there is a hierarchy of concepts, no level of concepts has more importance than any other and this is indicated by the setting of the concepts within a framework that shows them all leading to the final delivery of the requisite logistics support to enable the creation and sustainment of air power.

At Figure 10-1 the parallel framework of concepts for the logistics support of a joint force represents the requirement for a consistency with these concepts. The RAAF should be proactive in participating in the development of these joint concepts. The close relationship which should exist between operational and support concepts, although not shown in the Figure, is also a critical factor which is discussed in greater detail later in this Chapter.

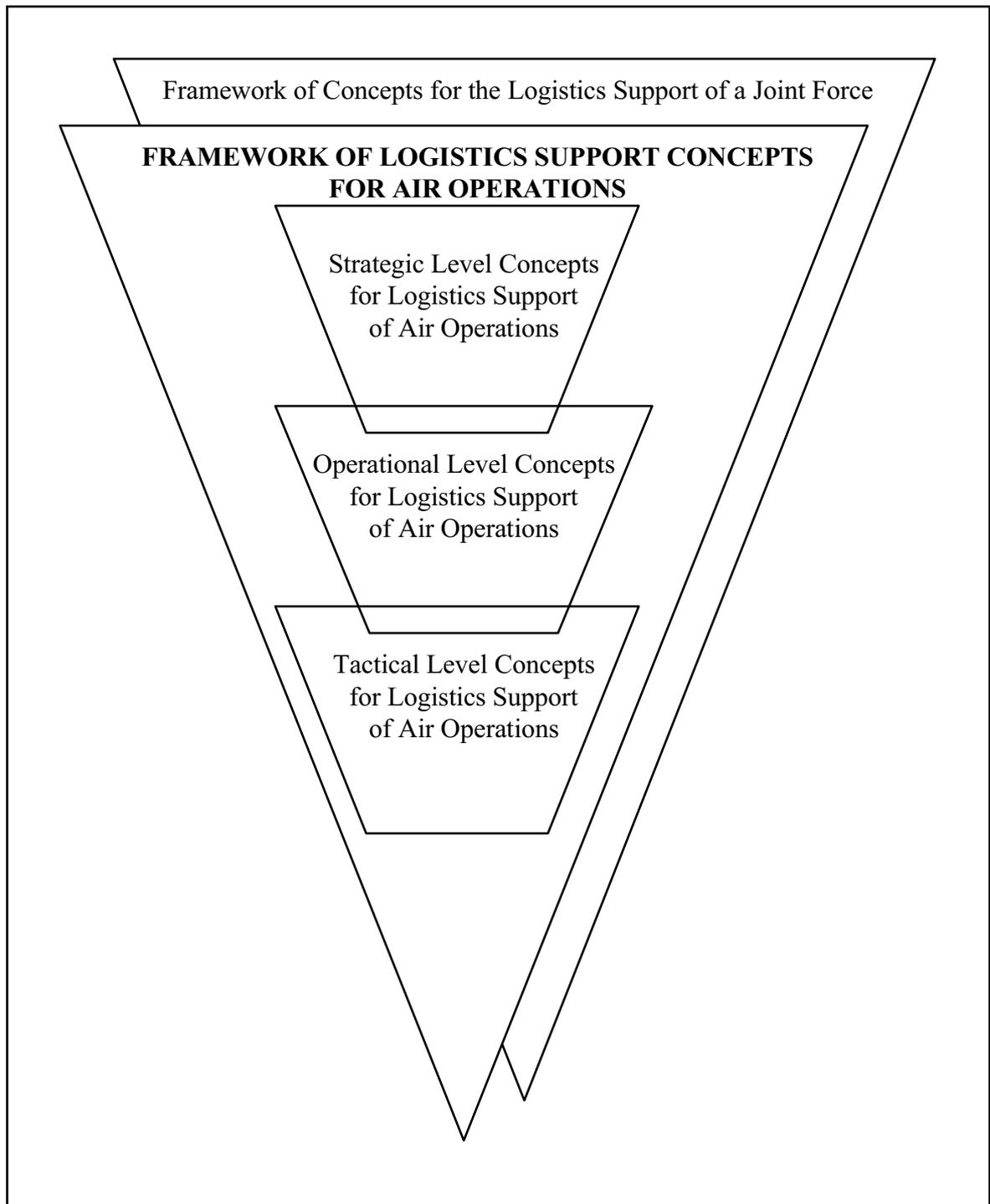


Figure 10-1: **A Framework of Logistics Support Concepts**

The Proposed Framework

The framework would form part of the strategic level concept and the following is a suggested list of topics that might be

covered. These aspects are discussed in subsequent sections of this Chapter:

- Introduction.
- What are logistics support concepts?
- What concepts are needed?
- The levels of war.
- Other levels of support.
- Consistency with doctrine.
- The joint environment.
- Command, control and communications.
- Interoperability for combined operations.
- International military and civil support.
- Relationship with operational concepts.
- Air base support.
- Civil-Military Coordination.

WHAT ARE LOGISTICS SUPPORT CONCEPTS?

Doctrine describes the fundamental philosophy concerning the employment of a defence force. It guides the application of combat power and details what military forces should do in war and why. Doctrine is dynamic and although constantly under review, it provides the first word on the way military forces conduct the business of war. Chapters Seven and Eight provided discussion on logistics doctrine proposed as relevant to the application of air power in Australia.

The various functional areas of the force need to translate the authoritative guidance provided in doctrine into a form that will allow the planning and performance of activities in a practical manner. This is achieved through the development of concepts of operations. A concept of operations is a broad statement of the

approach to be taken when performing a particular function. These concepts need to be developed at each of the three levels of war.

To enable logistics to satisfy operational requirements, the manner in which the operational forces are to be deployed and employed must be clearly spelt out. Important information requirements include force disposition, roles, anticipated duration of operations, rates of effort (expressed in flying hours), tempo of operations (ie. the rate of activity), and personnel and weapon requirements.

Logistics support concepts qualify and quantify the basic principles and philosophies contained in doctrine. They state, explain and defend the basic strategic assumptions and propositions underlying how the RAAF intends to provide support to meet operational requirements.

Strategic level support concepts need to focus on the ability to generate and move forces and materiel into the AO. The overarching concept at this level also needs to explain the relationships between support concepts at every level and with operational concepts. Development of strategic level support concepts are the joint responsibility of Air Force Office, Air Command, Logistics Command and Training Command.

Operational level support concepts describe the logistics support required to deploy and employ forces in the context of distinct objectives, force capabilities and broad mission roles and are often expressed in terms of organisational arrangements, campaign planning, and operational orders and instructions. Development of operational level concepts is primarily the responsibility of Air Command.

At the tactical level, units and squadrons will employ Standard Operating Procedures (SOPs) to detail the procedures and operating instructions for their deployment and support. SOPs need to be consistent with superior concepts.

A single, cohesive system of logistics support for operations needs support concepts or SOPs at each level to be appropriately focussed and responsibilities clearly delineated. The concepts/SOPs at each level are developed by logistics staff at different headquarters but all with the same end goal, the effective provision of logistics support for operations.

WHAT CONCEPTS ARE NEEDED?

The draft RAAF Strategic Concept for Logistics prepared by Logistics Branch within Air Force Office has proposed two broad forms of logistics concepts. The first of these is an overarching concept titled 'RAAF Strategic Concept for Logistics'. The second form involves a series of specific Strategic Logistics Concepts (SLCs).

The overarching RAAF Strategic Concept for Logistics currently explains the basic assumptions and propositions underlying how the RAAF provides logistics support to operations and provides the basis from which the more specific SLCs may be developed.

The SLCs are intended to examine the more specific functions and roles of logistics. The intention is for SLCs to be developed as the need arises. The list of key logistics functions stated as being indicative of what SLCs may cover is:

- Logistics command and control.
- Air base support.
- Single Service logistics support in the area of operations.
- Joint operations and planning.
- Mobilisation.
- Supply.
- Maintenance.
- Engineering.
- International and allied support.
- Australian industry and infrastructure support.
- Preparedness.

Figure 10-1 showed a representation of a framework of logistics support concepts through the levels. Figure 10-2 shows a representation of the strategic level concepts.

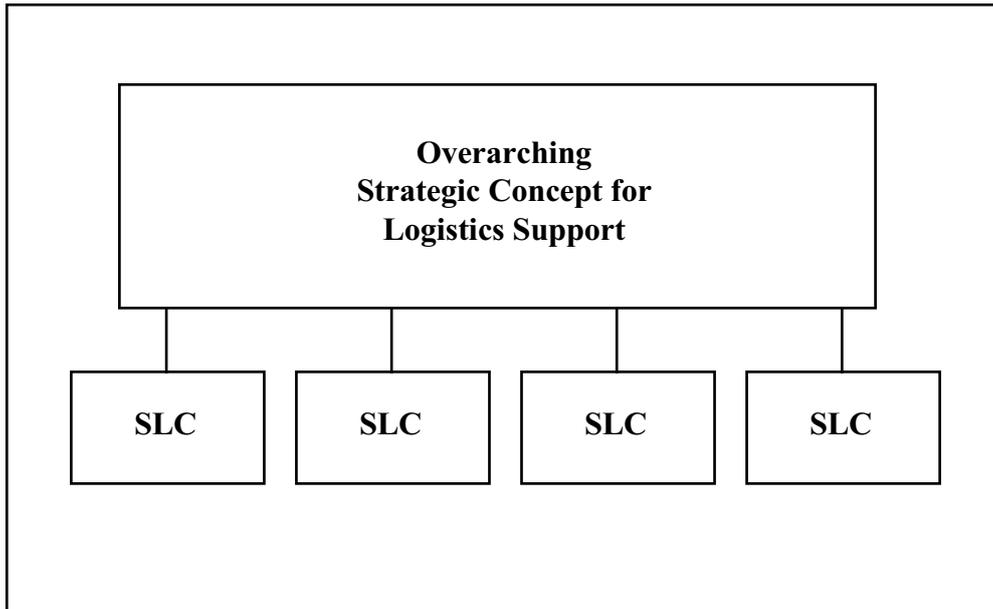


Figure 10-2: **Strategic Concepts for Logistics Support**

As outlined at Chapter Nine, operational level concepts are being developed on Force Element Group (FEG) lines, with a separate generic concept for use by air base wings. This is an effective means of providing operational level logistics guidance. It is proposed however, that an overarching concept be provided at this level based on the topic headings shown for the Tactical Fighter Group (TFG) concept shown at Chapter Nine and following the guidance provided by the proposed concept framework in this Chapter.

One reason for having separate logistics support concepts for each FEG is the differing support requirements of the Groups. However, there is a risk that individual FEG concepts may simply describe the support systems that have evolved over time and are currently in place. An overarching concept will specify ACAUST's requirements for the support of his forces. While there may be good reasons for differences in the manner of supporting the various Groups, the proposed concept will at least mean that such differences will be more clearly identified, and the reasons for the differences can be more readily identified and validated.

An overarching concept can also remove duplication in the FEG concepts by specifying those logistics support aspects which are common to all Groups. During the conduct of operations it is likely that aircraft from more than one Group will be located at the same base(s). In these instances, achieving the maximum possible commonality of support practices between the Groups becomes even more important.

Every squadron and unit requires Standard Operating Procedures (SOPs) and indeed most have them in one form or another. These SOPs need to be prepared in accordance with their respective FEG concept, which in turn is consistent with the overarching operational concept. This would ensure a greater commonality of procedures between individual squadrons and units. This more clearly delineated hierarchal structure will enable senior commanders to enjoy a greater level of confidence that all of the essential support aspects have been considered at every level. This structure is represented at Figure 10-3.

It is proposed that outline requirements for squadron and unit SOPs be provided as part of the FEG concepts. Each FEG Headquarters would then have an appropriate control on 'what' logistics aspects are being planned for at squadrons and units. As with consideration of concepts at the operational level this system would ensure greater commonality of logistics practices throughout squadrons and units. SOPs need to provide specific details on logistics support requirements for operations.

One Air Command FEG that will require different specifications for its logistics support concept is Operational Support Group (OSG). OSG is responsible for the preparation and coordination of support (communications and ground defence as well as logistics) for air and other designated forces operating forward. HQOSG, in having the responsibility for establishing the necessary support for Forward Operating Bases (FOBs), Bare Bases and Point of Entry (POE) airfields may be thought of as having a greater tactical role than the other FEG Headquarters.¹¹¹ OSG must also be responsive to the requirements of the other FEGs.

Figure 10-3 shows a representation of operational and tactical level support concepts. OSG is shown lower (diagrammatically) than the other FEGs as an indication of its more tactical focus. The Figure is only indicative in delineating the divisions between the levels

¹¹¹ The RAAF has varying classifications for air bases. A Main Operating Base (MOB) is an established air base with appropriate support provided on a day-to-day basis. The RAAF has two bare bases which are manned by caretaker staff and activated for exercises and operations as required. A third Bare Base (RAAF Base Scherger on Cape York Peninsula) will be completed by the year 2000. Bare Bases provide basic infrastructure and support services. An Forward Operating Base (FOB) may be a small civil airfield organised to support an operation. Any airfield may be designated a Point of Entry (POE) for the movement of personnel, equipment and stores into an Area of Operations (AO).

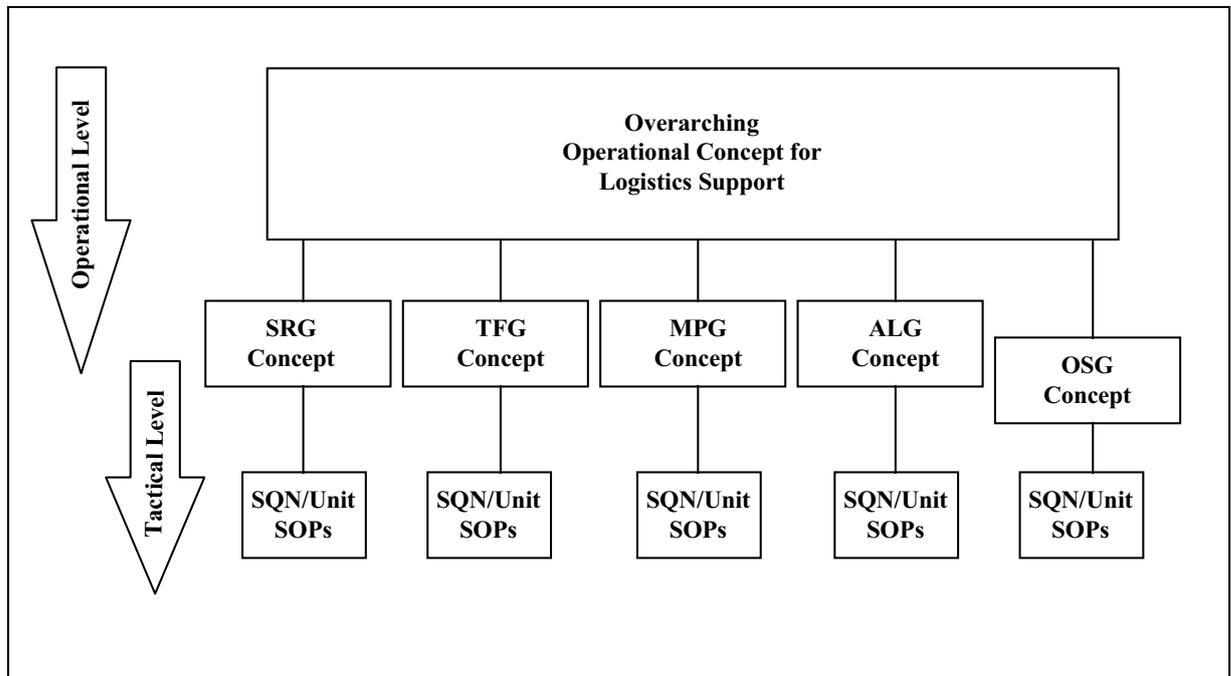


Figure 10-3: **Operational Level Logistics Support Concepts**

Chapter Nine referred to the impending development of a concept for the support of joint operations (this concept may encompass more than logistics). This Chapter has also referred to the requirement for Air Force concepts to be consistent with joint concepts. Efficiency and effectiveness in the logistics support of a joint force will be extremely difficult to achieve without the consistent and coordinated approach that a joint concept should provide. The logistics organisations and procedures that support the single Services are the prime source of logistics support to a joint force. Therefore a concept for joint logistics support would require the effective coordination of a large number of single Service agencies based on clear logistics command and control arrangements. The Air Force should take a proactive role in the development of joint support concepts.

THE LEVELS OF WAR

General

The importance of ensuring a consistent and continuous flow of logistics support through the levels of war and of reducing the overlap between these levels has been stated. It is essential to understand just what these levels are and what logistics activities would be carried out at each of these levels before there can be any further discussion on the shape of the logistics support concepts at each level.

There are three levels of war; strategic, operational and tactical.¹¹² The logistics efforts at these three levels must be integrated to provide the requisite support for the operational forces. The logistics activities performed at each of the levels should not be considered as separate or discrete activities. They should all merge into the continuous flow of support necessary to provide the most effective application of air power.¹¹³

Strategic Level

At the strategic level, decisions are made concerning the development, deployment and employment of the nation's armed forces in pursuit of national objectives. The development and deployment of forces can take place in peace time, and whilst armed forces may be employed on activities other than combat the term 'employment' is taken to refer to their use in hostilities. At the strategic level employment means the use of forces in the broadest sense. For example, forces may be employed to defend Australia's sovereignty on home soil or deployed overseas on United Nations operations.

Strategic concerns are broad in scope and are responsible for the development of a force structure, which includes planning, procurement of weapon systems and materiel, recruiting, training and sustaining personnel. They also involve deployment of this force structure.

At this level the primary logistics activities are:

- Mobilisation, force expansion and integration of the civil-military infrastructure to support the expanded force.

¹¹² RAAF air power doctrine refers to four levels; grand strategic, military strategic, operational and tactical, but states that military doctrine is only directly concerned with the last three. *The Air Power Manual*, (2nd Ed), pp 10-11. Accepted usage joins 'grand strategic' and 'military strategic' and refers to it as 'strategic'.

¹¹³ The list of logistics activities provided for each of the three levels of war is based on discussion in ADFP 20, *Logistics in Support of Joint Operations*.

- Requirement determination and materiel procurement.
- Combined logistics support strategies.
- Stocking policies.
- Guidance for the strategic movement of resources.
- Provision of facilities.
- Coordination of civil infrastructure.
- Demobilisation.

In an Air Force context, the responsibility for the performance of logistics activities at the strategic level rests with a variety of organisations, including those listed below. The responsibilities of these organisations do not necessarily cease at the strategic level:

- Department of Defence.
- Headquarters Australian Defence Force (HQADF).
- Air Force Office (AFO).
- Army Office and Navy Office.
- Headquarters Logistics Command (HQLC).
- Headquarters Training Command (HQTC).
- Commercial contractors.
- International military and civil support.

Operational Level

The operational level of war is narrower in scope and more specific than the strategic level. At this level strategy is linked to tactics by planning and directing military campaigns¹¹⁴ to achieve national security objectives.

¹¹⁴ A campaign is a series of operations which shares a common objective aligned to the overall conduct of the war.

There has been far less study of the operational level of war than of the strategic or tactical levels, particularly for air warfare. It has been proposed that there are two reasons for this absence of study. First, there is the difficulty of the subject. Strategy can be discussed with broad gestures across a map and tactics are something with which many have had direct experience either in war or training. Second, there was a certain sense, albeit incorrect, that nuclear weapons had made the massing of armies, navies and air forces obsolete. This tended to push the operational level of war into the background.¹¹⁵ This problem has also been observed in Australia, where one study, in discussing levels of air doctrine, noted:

Airmen have been comfortable with the concepts of strategic and tactical doctrine, and have applied that doctrine effectively (when supported with adequate resources) in the conduct of warfare and in force structure development and training. By contrast, the place in air force planning of operational level doctrine has not always been well understood.¹¹⁶

In the joint environment, there are also difficulties at the operational level. Command and control problems are being addressed in accordance with current strategic guidance and this will have an impact on concepts, including those for logistics support. The 1994 Defence White Paper made the following statement:

Our capacity for tactical level command is good, but we have not been as proficient in joint operational command of our forces. To provide for more effective command at the operational level, the existing joint headquarters will be collocated by 2000. This will provide more flexible options for operational command: where necessary, the appointment of a Commander Joint Forces Australia, the appointment of a lead Joint Force Commander or a continuation of our present system. A transitional arrangement will be established in 1995 at the existing Maritime Headquarters site at Potts Point. This will help define joint operational concepts, requirements and staff processes.¹¹⁷

¹¹⁵ This theory comes from Warden J.A., *The Air Campaign - Planning for Combat*, Pergamon-Brassey's, Washington, 1989, p 3. At the time of writing this book Colonel John A. Warden III USAF, was a Deputy Director of Plans, Headquarters, United States Air Force.

¹¹⁶ Stephens A. and Waters G., *Operational Level Doctrine: Planning an Air Campaign*, Air Power Studies Centre Paper, RAAF Base Fairbairn, Canberra, 1993, p 2.

¹¹⁷ *Defending Australia - Defence White Paper 1994*, pp 37-38, para 5.5.

Logistics support activities at the operational level are primarily the responsibility of a Joint Force Commander or Component Commander of a joint force. At this level the primary logistics activities are:

- Concentration and preparation of forces and materiel for onward movement.
- Formulation of logistics support plans to support operations.
- Distribution.
- Materiel management.
- Movement management.
- Resupply and sustainment.
- Personnel support.

At the operational level the main organisations involved in the provision of logistics support are:

- Air Headquarters (AHQ).
- FEGs.
- RAAF logistics management units.
- Weapon System Logistics Management (WSLM) Squadrons.
- Force Element Group Logistics support elements.
- Contingency Air Base Wings (CABWs).
- Mobile Air Terminal Unit (MATU).
- Agencies from the other Services and joint agencies.

The responsibilities of these agencies are not confined to the operational level, but may extend to both the strategic and tactical levels. For example, MATU would have individual Air Loading Teams (ALTs) which may be operating in a tactical environment.

Tactical Level

At the tactical level, forces manoeuvre and attack military objectives. Quite specific tasks are involved at this level, such as a single aircraft being tasked with an attack on a bridge. One description of the difference between tactics and the higher levels is that tactics are concerned with doing the job right, whilst the higher levels are concerned with doing the right job.¹¹⁸

The tactical level is where the effects of the operations logistics efforts at all levels are felt. The prime responsibility for logistics at this level rests with tactical level commanders. The tasks are performed by assigned specialist logistics units.

The primary logistics functions are:

- Arming the force with weapons and ammunition.
- Fuelling the force to provide tactical mobility.
- Maintaining equipment, including the recovery, repair and replacement of equipment.
- Providing tactical level facilities.
- Management of casualties.
- Movement of the force or elements of it.

The organisations involved at this level are listed below. The responsibilities of these agencies may, of course extend beyond the tactical level:

- RAAF force elements.
- Civil infrastructure support.
- Joint and other Service agencies.

Relationship Between the Levels

The division of logistics tasks between the three levels of war assists in the allocation of responsibilities, however it is vital to remember that the intention is to achieve a continuous and consistent

¹¹⁸ Drew D.M. and Snow D.M., *Making Strategy - An Introduction to National Security Processes and Problems*, Air University Press, Maxwell Air Force Base, Alabama, 1988, p 21.

flow of support. There is an overlap between the levels but care must be taken to ensure that this overlap is not too large. Too great an overlap in responsibilities will impede rather than assist the flow of support.

OTHER LEVELS OF SUPPORT

General

This study has based its discussions on the three levels of war and how logistics support can be provided through these levels. There are different sets of terminology that refer to the delineation of logistics support functions into levels which are referred to throughout RAAF and joint publications. This Section discusses lines of support and echelons of support, and the relationship between them and the levels of war.

Lines of Support

ADF doctrine recognises four lines of support.¹¹⁹ These lines of support refer to the source of support provided to units:

First Line Support. The support that is provided from a unit's own resources is first line support. The resources and activities that provide first line support to the unit are commanded by the unit commander.

Second Line Support. Support that is provided to a unit by elements which are organic to a combat formation is second line support. The resources and activities that provide this level of support are under the control of a formation or FEG commander for the logistics support of units in that force.

Third Line Support. Third line support is that support provided to a force by elements in the AO which are not organic to the force.

Fourth Line Support. Fourth line support is that, other than first, second or third line, which is provided to organisations usually outside the AO.

Echelons of Support

¹¹⁹ ADFP 20, *Logistics in Support of Joint Operations*, p 1-5.

ADF doctrine outlines the structure for the support of air operations.¹²⁰ This doctrine states that the support structure utilises forward, base and rear echelons based on command relationships. To augment this support structure, maximum use is made of civilian infrastructure wherever possible. Civilian support needs to be quantified and incorporated into the logistics plan to support or complement military operations.

Forward Echelon. Forward support is that which is integral to the unit operating independently in the AO. Flying units deploy with deployment stocks which comprise Fly Away Kits (FAKs) which are complemented in the AO by caches and ready use kits pre-positioned by OSG. Air Headquarters has overall responsibility for the management of those deployed stocks and, in consultation with the units, determining their composition.

Base Echelon. Base echelon support is the responsibility of air base wings which provide a full range of base management and support services to home base and transient customers. Air base wings are responsible for the receipt, storage, issue, stores accounting, disposal, distribution and local procurement of domestic items in support of their base. They are also capable of providing the full range of base services including health, administration, communications, air terminal, air traffic control, fuel and catering. Location, size of deployment and duration determine the services provided at base bases or POE. Operational reserve stocks are held at bases of the applicable FEG to sustain operations.

Rear Echelon. Rear echelon support sustains operations at a larger scale. Materiel supply and resupply, maintenance and engineering support and purchasing of consumable and ready use stores is provided by Logistics Command, Defence National Storage and Distribution Centre (DNSDC) and civilian sources of supply. Rear echelon support may be provided direct to deployed units through an air base wing. Deployment reserve stocks are held by rear echelon support agencies, in addition to operational deployment and operational reserve stocks, to support sustainment of deployed forces.

Relating the Levels of Support

As discussed, varying terminology is used in different single Service and joint publications. Figure 10-4 shows the correlation between the levels of war (as viewed from a logistics support perspective), the lines of support and the RAAF's echelons of

¹²⁰ *ibid*, p 9-1.

support. An exact delineation is not possible and the Figure is only indicative.

Strategic	Operational		Tactical
Rear echelon	Base echelon	Forward echelon	
Fourth line support	Third line support	Second line support	First line support

Figure 10-4: **Logistics Relationships Within the Levels of War**

CONSISTENCY WITH DOCTRINE

General

Whilst the framework of logistics support concepts and the concepts themselves should not necessarily repeat doctrine, they must be consistent with it. Chapter Seven provided discussion on logistics doctrine whilst Chapter Eight proposed a logistics doctrine for the RAAF. The discussion in this Chapter on logistics support concepts is based on the proposed doctrine outlined at Chapter Seven. Therefore, whilst the following aspects need not necessarily be stated they most certainly should be reflected in the proposed framework and the concepts themselves.

The strategic level concept for logistics support currently being developed covers several aspects which are clearly doctrinal in nature and which are not fully consistent with current doctrine. Chapter Seven espouses several reasons why these broad areas of high level guidance should be covered in doctrine. Concepts may briefly reiterate some of the pertinent points of doctrine and may specify in more detail, in a manner appropriate to the level of the concept, how certain aspects of that doctrine are to be implemented. Chapter Eight provided a proposed new logistics doctrine for the RAAF and the key points of that doctrine are briefly outlined in this Section.

Dependence on Bases

The extent of the dependence of air power on bases must be fully recognised and is a consideration that must be factored in to all logistics support concepts.

Pervasiveness of Logistics

The framework, whilst recognising the different levels and responsibilities for the provision of logistics support, must view logistics as one system directed towards a common goal. Indeed establishment of an effective framework will foster a common focus through all of the levels.

Logistics Principles

A set of logistics principles was incorporated in the proposed doctrine at Chapter Eight. These principles are useful as a guide for logistics planners, and are of assistance in preparing a framework of logistics support concepts. Chapter Eight provides a discussion of these principles, and a summary of them from that Chapter is repeated in Table 10-1.

RESPONSIVENESS	Getting the right things in the right amount to the right place at the right time.
SIMPLICITY	Keep it simple.
FLEXIBILITY	Be able to operate in any environment and adapt to changing circumstances.
ECONOMY	Maintain an appropriate balance between resource usage and resource conservation.
ATTAINABILITY	Know what you can and must do.
SURVIVABILITY	Survive to prevail.

Table 10-1: **Logistics Principles**

Required Characteristics of the Logistics System

There are certain characteristics that are essential in a logistics system that is required to support air operations. These characteristics are listed here, but a fuller discussion of them is provided at Chapter Eight. Whilst not an exhaustive list, these characteristics are considered fundamental to an efficient logistics support system, and their attainment should, therefore, be a goal of any logistics support concept:

- Security of lines of communication.

- Asset visibility.
- A trained and validated logistics organisation.
- A systems approach.
- Mobility.
- Ability to efficiently transition to and from war.

THE JOINT ENVIRONMENT

Operations involving Australian forces will almost certainly be joint in nature. The coordination of efforts between the Services is vital and there are a number of important considerations in achieving this goal:

- The centralisation and coordination of command and control arrangements.
- The coordination of the support efforts of the Services.
- Standardisation of equipment (including computer hardware and software), policy and procedures (such as single Service logistics management procedures).

The importance of a joint approach to defence planning and activities is continuing to grow and the ADF will continue to explore joint solutions. There are several areas, such as the establishment of a co-located joint headquarters, that are currently being investigated. Apart from the improved effectiveness that joint practices provide, there are considerable efficiencies to be achieved. The Government intends to pursue this avenue of efficiency. In a ministerial statement to Parliament made when releasing the 1994 Defence White Paper the Minister for Defence stated:

We will use our defence capabilities more efficiently. All elements of the Australian Defence Force will work closely together as an integrated force, and make the best possible use of their equipment and facilities.¹²¹

The Logistics Strategic Planning Guide (LSPG) recognises the importance of jointness in the provision of logistics support.

¹²¹ *Defending Australia - Defence White Paper 1994*, Ministerial Statement by the Minister for Defence, Senator Robert Ray, 30 November 1994.

Principle Three of the LSPG (Streamline Logistic Support) states as it's third goal (with accompanying strategies):

Maximise the use of joint or shared logistic arrangements and facilities.

- Eliminate unnecessary duplication of logistic facilities, arrangements and resources between elements of the ADF, and between Defence and external organisations.
- Employ SSLM to the maximum extent in the provision of common user commodities, systems and services.

The concept of joint logistics support of ADF operations relies heavily on the effective coordination of the many agencies which provide logistics support to the Services. This coordination task is complex because these agencies may be military, civilian, contractor or a mix. The logistics organisations that support the single Services on a day-to-day basis are the fundamental source of logistics support for a joint force. A necessary requirement of joint logistics is to establish joint logistics command and control arrangements which effectively harness the existing single Service and logistics infrastructure, and coordinate the provision of support to a joint force through well established lines of communication.

Development of a framework for logistics support concepts for the RAAF cannot be completed without consideration of joint aspects. Although there is currently no concept for the logistics support of a joint force, a joint concept may commence development in the near future (refer Chapter Nine). Because of this an opportunity exists for the RAAF to have a strong input into the development of joint support concepts.

Environmental concepts need to be consistent with the joint concept. That is, the joint concept should provide the overarching guidance on how logistics support should be provided. The environmental concepts should provide more detail and discuss those aspects that are unique to their own environment. Figure 10-5 shows the relationship between the joint and environmental concepts.

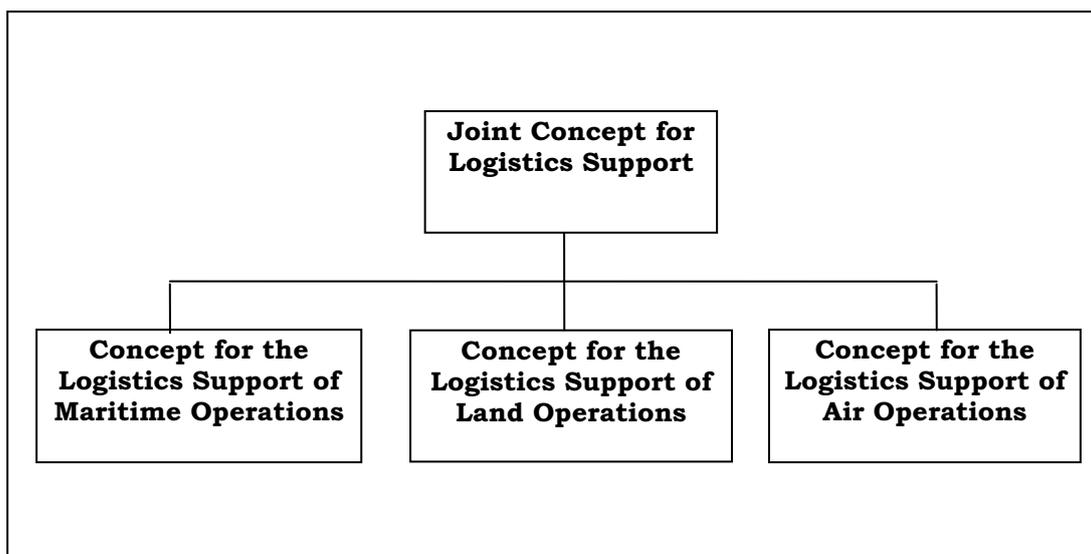


Figure 10-5: **The Relationship Between Joint and Environmental Concepts**

COMMAND, CONTROL AND COMMUNICATIONS

The logistics command control and communications (C3) system must be capable of synchronising the logistics support activities across the three levels of war. C3 should be organised to enable the logistics system to function as one support system focussed on supporting the joint force.

Common automated information systems that facilitate communication, support decision making and provide total visibility over resources are necessary to achieve this harmony. This coordination in command and control arrangements must occur across through the levels of war and across the three Services. There must also be compatibility with likely friends and allies.

In a joint setting, Figure 10-6 indicates how Australian command authorities fit within the levels of war. As discussed earlier in this study there is an overlap between the levels which makes the delineation of command authorities difficult. This less than obvious delineation of command authority levels make it critical for clear definitions of authority to exist in both the joint and single Service arenas.

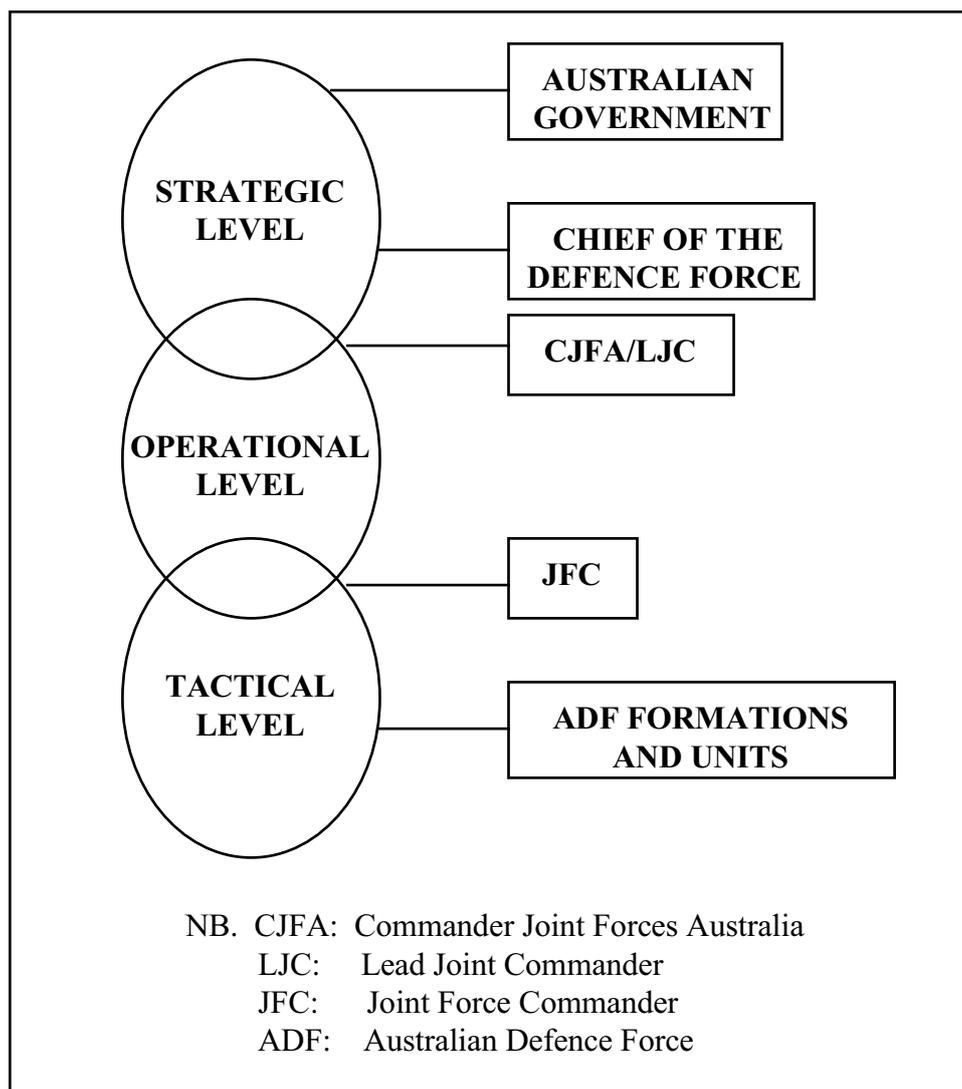


Figure 10-6: **Command Levels**

ADFP 2 *Division of Responsibilities Within the ADF* prescribes logistics support responsibilities.¹²² This joint doctrine states that the Service Chiefs of Staff are responsible for the provision of logistics support to their own forces with the ultimate responsibility for the logistics support of a joint force resting with CDF. It is necessary for the concepts of logistics support at each level to clearly specify the responsibilities for logistics support. The current strategic level concept outlines responsibilities as listed in current doctrine, but more detail will be required at the other levels.

The absence of clear guidance on command and control has created some confusion in the delineation of responsibilities. At a

¹²² ADFP 2 *Division of Responsibilities Within the ADF*, Director Publishing, Defence Centre, Canberra.

recent conference on the operations support for air operations in Australia a number of important issues were raised that affected logistics support at the tactical level. One of these was effective command and control, including authority and responsibility. The following point was made:

Importantly, a clear conduit and command and control arrangement is not currently identified, but is determined for each operation. I suggest that this simply results in confusion.¹²³

There is a great deal of activity within Air Headquarters which will lead to an integrated command and control support system extending from Air Command down to squadrons. The network will integrate operations with components of the intelligence and logistics systems.

Effective command and control is essential for the conduct of all aspects of military operations. Therefore, clear guidance is required in concepts at all levels. This provides another argument for the development of an overarching concept of logistics support at the operational level, as indicated at Figure 10-3.

INTERNATIONAL MILITARY AND CIVIL SUPPORT

A significant proportion of the RAAF's logistics support equipment and services is procured from overseas through both military and civil agencies. Australia has also established a number of mutually beneficial cooperative logistics support arrangements with other nations. The current strategic concept for logistics support provides excellent guidance on the utility of this overseas support.

Systems and procedures that encourage interoperability with allies will enable the ADF (and the RAAF) to gain greater benefit from training and exercises, make mutual logistics support tasks easier and enhance the effectiveness of effective combined operations.

¹²³ Coleman J., 'Logistics Support to Deployed Operations' in Waters G. and Casagrande E. (ed) *Presentations from a RAAF Operational Support Workshop*, Air Power Studies Centre, RAAF Base Fairbairn, Canberra, 1996. At the time of the presentation, Wing Commander Josh Coleman was the Officer Commanding, Operational Support Wing, Operational Support Group. The presentation was given to a workshop on Operations Support in the RAAF held in Canberra on 21 and 22 February 1995. The other issues raised were the requirement for appropriate logistics doctrine and concepts of operations, and problems associated with manpower and training.

RELATIONSHIP WITH OPERATIONAL CONCEPTS

One of the most crucial elements in constructing a framework of logistics support concepts is the relationship with operational concepts. Discussion in Chapters Four and Five of this study focussed on the relationship of logistics to operations. This aspect was again covered in the doctrinal discussions in Chapters Seven and Eight. The current strategic concept for logistics support errs in its coverage of this vital aspect. The linking of operational and logistics planning is a necessity.

This linkage is inviolable. A recently completed study which analysed the air operations conducted over Borneo in 1945 as part of the series of joint operations known as Oboe¹²⁴ made the following observation:

Conduct of the air operations over Tarakan revealed that it was possible to have an air force, yet not deliver effective air power on every occasion. There were other examples of this throughout the subsequent Oboe operations. The conduct of effective air operations is predicated on a complete system - not a collection of air power 'bits and pieces', but a complete, operable and functional system. Quite obviously, such a system can only be as strong as its weakest link. Vertical integration of the elements of air power was fundamental to success in the three Oboe operations.

Following on from the previous point, administrative support had to be tied to operations. In this, the identification of operational logistics, communications, and infrastructure was vital.¹²⁵

The study then relates these lessons to the current organisation of the RAAF.

The importance of a close relationship between logistics and operational planning is stressed in current US doctrine. The prime joint doctrine publication of the US armed forces makes the following assertion:

¹²⁴ The Oboe operations involved the retaking of Borneo from the Japanese by the Allies in 1945. The Oboe operations involved mainly Australian forces and overall constituted a notable tactical success. Air operations were a significant part of each of the three Oboe operations - Tarakan, Labuan Island-Brunei Bay and Balikpapan.

¹²⁵ Waters G., *Oboe - Air Operations Over Borneo 1945*, Air Power Studies Centre, RAAF Base Fairbairn, Canberra, 1995, pp 165-166.

Logistics sets the campaign's operational limits. The lead time needed to arrange logistics support and resolve logistics concerns requires continuous integration of logistics considerations into the operational planning process. This is especially critical when available planning time is short. Constant coordination and cooperation between the combatant command and component staffs - and with other combatant commands - is a prerequisite for ensuring timely command awareness and oversight of deployment, readiness, and sustainment issues in the theatre of war.¹²⁶

The extent to which logistics considerations are integrated within operational planning in the Australian context requires critical review.

AIR BASE SUPPORT

Air base support involves more than logistics. A clear statement of the requirement for all levels of planning to recognise the importance of the air base in the support of air operations is necessary. At a recent workshop on operations support in the RAAF the following observation was made:

Australian doctrine and recent restructuring within the RAAF emphasise the integral contribution of the air base to air power. Sadly, I believe that this important factor has been neglected in the past, and I am probably as guilty as the next aviator. The base squadron, the base support wing, and more recently the air base wing, were viewed as support affairs, 'blunts' in comparison to the aviators who saw themselves as 'sharps'. I believe that this attitude still exists in some quarters. This view is inherently dangerous and blinkered for the effective application of air power. All parts and sub-parts must interact to provide the team with synergy for optimum affect. I would even go so far as saying that in the recent times of air power discussions the air base has received little, if any, attention, yet it is fundamental to the generation of air power.¹²⁷

¹²⁶ *Joint Warfare of the US Armed Forces*, p 46.

¹²⁷ Presgrave P. 'The Role of the Air Base in Air Power' in Waters G. and Casagrande E., *Presentations from a RAAF Operational Support Workshop*. Group Captain Phil Presgrave is the Officer Commanding, Air Base Wing, RAAF Base Amberley.

It is important that air base support remain flexible, consistent and mobile to allow responsiveness in augmenting, deploying to or activating bases. The logistics principle of survivability (refer Chapter Eight) is particularly applicable. The vital importance of air bases to the generation of air power makes air bases attractive targets. Therefore, support activities on bases must be planned with this factor in mind. The lines of communication that support air bases must also be resistant to or protected against enemy action. Douhet argued that :

...it is more effective to destroy the enemy's aerial power by destroying his nest and eggs on the ground than to hunt his flying birds in the air.¹²⁸

CIVIL-MILITARY COORDINATION

Chapter Four discussed the importance of planning for the employment of all of the elements of a nation's war making potential. Strategic guidance makes the requirement for a national approach to defence clear. Strategic Review 1993 makes the following statement:

The defence of Australia is a national responsibility. Therefore a key priority for Australia is the harnessing of our national resources - military and civilian - to achieve the most cost effective defence effort. Australia's history shows the importance of an integrated national effort to successful military endeavour. Defence depends critically on a wide range of services provided by the commercial sector.¹²⁹

The military will always be reliant on support from various areas of the national support base. The extent of the reliance will be dependant on the nature of the contingency. It is incumbent on the military to be aware of what support is available, how it can be accessed and what required areas of support need to be developed further. This support will be sourced from national industry, agencies of the Federal, State, Territory and Local Governments, philanthropic organisations, and the civil community. At present there is still some work to be done to fully achieve the maximum benefits of a structured and coordinated national approach to defence. *Strategic Review 1993* states:

¹²⁸ Quoted in Waters G., 'Air Bases', *Australian Defence Force Journal*, Department of Defence, Canberra, May/June 1995.

¹²⁹ *Strategic Review 1993*, p 51, para 6.1.

Formal coordination arrangements should be buttressed by a network of consultation between defence and civil agencies. In peacetime, this should extend to further consultation in development of contingency plans and major equipment proposals to help different agencies see each other as natural partners. Defence's requirements from the civil sector should be defined more clearly, and policies developed for making most efficient and effective use of civil resources in the national defence effort.¹³⁰

Current strategic direction for logistics planners, as provided by the *Defence Logistics Strategic Planning Guide* (LSPG), gives emphasis to the necessity of planning on the basis of a national logistics infrastructure. Principle II of the LSPG states:

Promote Logistics Self-Reliance. Principle II addresses the logistics infrastructure appropriate to supporting the defence of Australia. It covers the military, industrial and civil infrastructure, emphasising the need for Defence to make the maximum use of non-military resources. This principle also addresses the need to facilitate Australian industry support for the ADF through greater involvement by the Services in identifying opportunities for logistic support roles that can be performed by Australian industry.¹³¹

Two of the four goals of this principle, and their accompanying strategies have particular relevance to this discussion. They are:

- Determine the national logistics infrastructure for maintaining military capability.
 - * Determine the national strategic logistics infrastructure for the defence of Australia, incorporating maximum utilisation of civil and industrial facilities and services.
 - * Review the need for, and location of, defence logistics facilities to meet strategic logistics needs.
 - * Determine priorities for the development of programs and arrangements which address the shortfalls in the strategic logistics infrastructure.

¹³⁰ *ibid*, p 51, para 6.3.

¹³¹ *Defence Logistics Strategic Planning Guide*, p 18.

- Improve the ability of the national infrastructure to support ADF operations.
 - * Ensure national and international infrastructure requirements are properly considered in the force development process for major defence equipment and facilities.
 - * Involve the Service agencies responsible for providing logistics support in the determination of infrastructure priorities, particularly for the through life support of weapon platforms and combat systems.
 - * Develop contacts and arrangements with civil agencies and industry which will facilitate logistics support in contingencies.¹³²

Civil-military coordination is an essential area for coverage in all logistics support concepts. In line with strategic guidance formal arrangements must be put in place and consultation and coordination must be strong at all levels. Over many years there has been a great deal of activity in these areas and inclusion of relevant information in the appropriate logistics support concept will assist those charged with the planning and execution of logistics support. It will also assist in identifying those areas where more activity is warranted.

Civil-military coordination required to support a national defence effort includes legislation, industry, specific arrangements with government agencies (eg. Australian Customs Service and government transport operators and authorities etc) utilisation of local civil infrastructure and assistance from and to the civil community.

CONCLUSION

The current status of logistics support concepts within the RAAF does not ensure the provision of support to the conduct of air operations in the most effective manner possible. This situation has been recognised and recent work has been undertaken on logistics support concepts. This study makes some proposals on the continued development of these concepts.

First, it is considered of prime importance that a structured framework of logistics support concepts be established.

¹³² *ibid*, p 22.

This framework should specify the concepts required at each level, their relationships and key elements. The framework must lay common groundwork for the development and maintenance of support concepts at all levels, assist in appropriate delineation of responsibilities for all logistics tasks, including planning.

The framework would also contribute more effectively to the provision of a single system of logistics support flowing from the rear echelon support base to the point(s) of air power application. This Chapter has deliberately not provided a complete framework. Several areas need to be addressed, and a structure for further development work has been proposed. A framework should exist in a clearly defined manner, as an integral element of the strategic level concept.

Second, this study has advocated the importance of doctrine. Doctrine provides essential guidance on how military forces should go about the business of war, and in the context of this study, how military forces should go about the business of supporting war. Logistics doctrine that provides high level guidance to logisticians, commanders and those involved in all types of planning at all levels is critical to the ultimate effectiveness of supported combat forces. Hence the exclusive incorporation of matters that most properly belong in statements of guidance at the highest level, that is doctrine, within support concepts is not a positive step. That is not to say of course that endorsed doctrine should not be briefly reiterated. It must be followed in the development of logistics support concepts.

The framework proposed in this Chapter needs to be prepared in a joint environment and be consistent with joint procedures. Development of a joint support concept has not yet commenced and as the Air Force is currently reviewing the concepts of logistics support for air operations, there is a window of opportunity for the Air Force to influence joint concept development.

Within the framework itself, as proposed in this Chapter, there are still some areas that require further development work. These areas include: command, control and communications; the relationship between support and operational concepts; and planning and civil-military cooperation. The development of a logistics support concepts framework will also highlight those issues that require further attention.

The framework also provides a capacity to control the overlap in responsibilities between the levels of war. This would ensure comprehensive coverage of important aspects, and facilitate timely and effective support for the combat forces.

CHAPTER ELEVEN

SUMMARY AND RECOMMENDATIONS

A military maxim has it that amateurs talk about strategy while professionals talk about logistics.

*Time Magazine
20 August 1990*

SUMMARY

Australia has a requirement for capabilities that can deny the sea and air approaches to an adversary and defeat incursions onto Australian territory. The ADF must therefore be able to operate over an area that exceeds 10% of the earth's surface. Additionally, the ADF has been, and will continue to be, involved in activities that require military deployments to locations around the world.¹³³

The vast area in and to the north of Australia, combined with harsh climatic conditions, and poor communications and transport infrastructure places a large burden on the ability of the national support base to provide the requisite logistics to conduct and sustain military operations. While any operations that will be conducted by the ADF will almost certainly be joint in nature, there remain differences in the way forces in the three combat environments; sea, land and air, will operate. This includes the provision of logistics support. This study has concentrated its discussion to the logistics support of air operations.

Logistics is all about preparedness. It enables the creation and sustainment of air operations. Changes in a number of areas, including strategic circumstances, strategic guidance, financial guidance and technology make the process involved in determining preparedness levels dynamic. Preparedness issues are fundamental considerations for effective defence planning which involves operations, planning, training and logistics aspects. It is therefore apparent that preparedness involves more than logistics, though it could be argued that logistics is all about preparedness. This study has viewed logistics within the context of preparedness.

¹³³ *Defending Australia - Defence White Paper 1994*, pp 14-15, paras 3.6-3.11.

The importance of logistics in the provision of air power is often understated. Failure to provide adequate attention to logistics in planning, exercising or resource allocation can undermine the most efficient operational forces. An appropriately planned and executed logistics support system can provide another dimension to a commander's flexibility. Conversely, a failure of logistics can severely limit a commander's options and probably lead to failure.

The functions that are performed under the heading of logistics are exceptionally varied and specialised, and each must of necessity be performed by personnel qualified in each field, ie. specialist personnel. It is in the logistics planning and command functions that officers with an understanding of all logistics elements, and the relationships between them are essential. It is in this regard that adequate doctrine and support concepts become critical. There must also be adequate training and exercising of the logistics role.

Many logistics activities are performed to support the Air Force on a day-to-day basis and provide the wherewithal for operations in the future. Some logistics activities, however, focus on the provision of logistics support for current or pending operations. This study has referred to this latter classification of logistics as 'operations logistics' and the former as 'non-operations logistics'. Proposed definitions for operations and non-operations logistics were provided and explained in Chapter Five. The definition for the proposed term 'operation logistics' is:

Operations logistics encompasses all logistics functions, or elements thereof, which are required to generate or sustain specific operations.

In developing military capabilities for the defence of Australia it is essential that the context of logistics be clearly understood. Operational doctrine, concepts and plans should not be developed without due consideration being given to the other elements of a nation's war making potential. Logistics is not an adjunct to a nation's military capability. It is an essential and integral part of it. That fact must be fully accepted if a credible and effective force is to be developed. Only then can a nation most effectively utilise, or credibly threaten the use of, its combat power.

The Air Force must measure its capability by its ability to successfully conduct specified tasks within the necessary time scale and then be able to sustain those activities for as long as required. Other erroneous measures of capability, such as orders of battle and tooth-to-tail ratios are, in the final analysis, meaningless. All elements need to be focussed towards a common objective.

Having placed logistics in its appropriate context the Air Force must then focus on its provision in the most appropriate manner. Logistics activities are performed to enable the force to function on a day-to-day basis, provide the wherewithal to conduct future unspecified operations, and conduct specified current or pending operations. The ideal method for providing logistics support for these activities may differ if they are treated in isolation. For example, the provision of logistics support for day-to-day activities may be likened to the requirements of supporting a business activity. However, the requirement to prepare for combat operations will involve activities that are, in some significant respects, at odds with business practices.

There is a clear and accepted requirement for military forces to spell out the fundamental philosophy concerning their employment. This guidance, in the form of doctrine, assists in understanding 'the how, what and why' of the application of combat power. The RAAF has made significant advances in the development of air power doctrine over the last few years and now has a very effective doctrinal base on which to provide air power in the defence of Australia and for other tasks that may arise. Most importantly, the RAAF also developed this doctrine in a manner that meant it would be viewed as a process and hence would not lose its relevance with changing circumstances.

As part of this continuing development process, this study has proposed changes to logistics doctrine. The existing doctrine has provided a level of guidance that had not existed before and has achieved a great deal. The proposed doctrine has a slightly altered focus in that it provides broad guidance on what logistics means to the provision of air power, and provides a set of principles and desired characteristics of an effective logistics system for the provision of air power in Australia. This guidance has been prepared in such a manner as to be of assistance to staff involved in a large range of activities. Given this, and the nature of logistics as a component of military capability it is argued that this doctrine needs to be a part of *The Air Power Manual*.

The ADF and the RAAF have always worked on the development and refinement of operational concepts and these operational concepts have included some consideration of logistics aspects in varying degrees of detail. However, at present there is inadequate guidance for the continued development of logistics as a unified system of support. That is, logistics, as stressed earlier in this study, needs to be viewed as a single system of support which flows from the national support base through to the final application of air power. Therefore, there needs to be a coordinated system of developing logistics support concepts at each of the levels of war.

There is currently a great deal of activity being carried out on the development of logistics support concepts both at the joint and RAAF levels. Development of a framework of logistics support concepts would provide the necessary coordination to assist this development work.

This study has argued that there is a requirement to develop a framework of logistics support concepts. This is to ensure that there is a comprehensive coverage of all logistics aspects, to avoid duplication and to ensure that there is a consistent, complementary and comprehensive approach at all levels. Logistics activities, including planning, for operations are required at every level (pervasiveness) and there are no clear lines delineating the levels. It is important that the RAAF undertake the development of a framework of logistics support concepts in a manner consistent with the requirements of conducting operations in a joint environment. The development of joint logistics support concepts are not well advanced and the RAAF could contribute productively to this development work.

A major challenge in developing logistics support concepts at the various levels is to ensure a smooth and continuous flow of logistics support to the tactical level of operations without the overlap between the levels becoming too large. The development of too large an overlap between the levels, which invariably occurs downwards from the strategic level, will inevitably result in duplication of effort, confusion and loss of flexibility at the tactical level. The reason for the potential overlap downwards is that staff have a tendency to concentrate on those aspects with which they are most familiar.

Of prime importance is the need for a structured framework of logistics support concepts. This framework would specify what concepts are required at each level, what their relationships are with each other and with operational concepts, and what elements should be included in them. It would lay a common groundwork for the development and maintenance of support concepts at all levels, assisting in an appropriate delineation of responsibilities for the performance of all logistics tasks, including planning.

The framework would also contribute more effectively to the provision of a single system of logistics support flowing from the national support base to the point of air power application. This study has not provided a complete framework. There are still several areas that need to be addressed, however, a structure for further development work has been proposed.

Within the proposed framework itself there are still some areas that require further development work. These areas include

command, control and communications and the relationship between support and operational concepts and planning. The development of a logistics support concepts framework will assist in highlighting those issues that may require further attention.

The existence of a common framework for formally endorsed logistics support concepts at all levels will greatly facilitate RAAF activities in a number of areas:

- The ability to take a comprehensive, coordinated and consistent approach to the delivery of logistics support to air operations, without undue overlap or duplication.
- The determination and allocation of resources.
- The development of properly focussed logistics training and exercise activity.
- The provision of adequate guidance from the strategic down to the tactical level.
- An improved capability to effectively integrate operational and logistics planning.
- An improved understanding of the system-wide logistics support requirements of air operations that will enhance the RAAF's ability to operate in a joint environment and assist in the development of joint logistics support concepts.

RECOMMENDATIONS

General

This study has discussed a manner of viewing the context of logistics when planning for and conducting operations. There have also been a number of recommendations and proposals made throughout the study. Some of these recommendations have been specific, whilst others propose further work on defining a perceived problem. These recommendations are outlined in the following paragraphs.

Operations Logistics

To allow a more appropriate focus on those logistics tasks that will impact on current and pending operations, and to avoid confusion with the tasks performed at the operational level of war, the following new terms and definitions are proposed for acceptance into both RAAF and joint terminology, and, therefore, incorporation into the ADFP 101 *Glossary of Terms*:

Operations Logistics

Operation logistics encompasses all logistics functions, or elements thereof, which are required to generate or sustain specific operations.

Non-Operations Logistics

Non-Operations Logistics encompasses all logistics functions, or elements thereof, which are not, at the time being considered, required to generate or sustain specific operations.

These proposed terms and definitions are discussed in detail in Chapter Five.

Doctrine

Current doctrine does not reflect the importance of preparing strategies that are based on employing all elements of a nation's war making potential. A nation's capacity to undertake operations is dependant upon the full range of these elements. Therefore, it is recommended that *The Air Power Manual* be amended to reflect the requirement to incorporate consideration of all of the elements of a nation's war making potential into the preparation of strategies. The war making potential of a nation is discussed in more detail in Chapter Four with further discussion on the recommended changes to doctrine in Chapter Seven.

It is recommended that logistics doctrine must be retained in the prime doctrine publication of the RAAF, DI(AF)AAP 1000 *The Air Power Manual*. This doctrine must be of sufficient length to provide adequate guidance to the variety of people who require access to it, including non-logisticians. This recommendation is discussed in Chapter Seven. A proposed new logistics doctrine, for inclusion in *The Air Power Manual*, is detailed in Chapter Eight.

Logistics Support Concepts

It is recommended that the RAAF develop a framework of logistics support concepts similar to that proposed at Chapter Ten. The proposed framework also specifies some areas that require additional definition or development. These areas are command and control and the relationship between operational and support concepts. The development of a framework as proposed will also assist in identifying other areas that will require clearer definition or additional study. It is also recommended that the RAAF take an early and active role in the development of joint support concepts. These aspects are discussed in Chapters Nine and Ten.

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