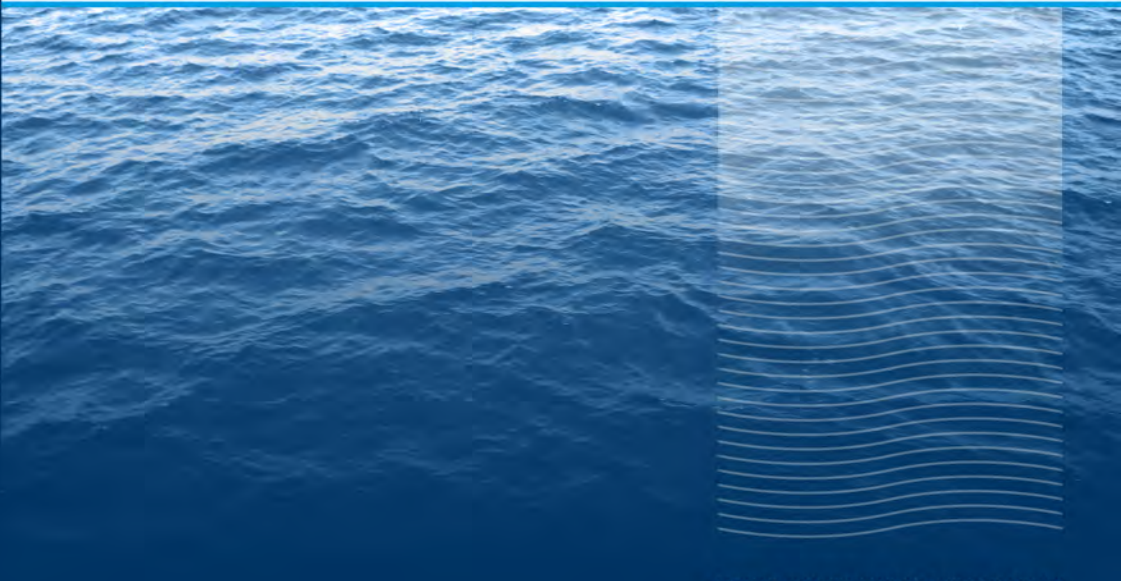


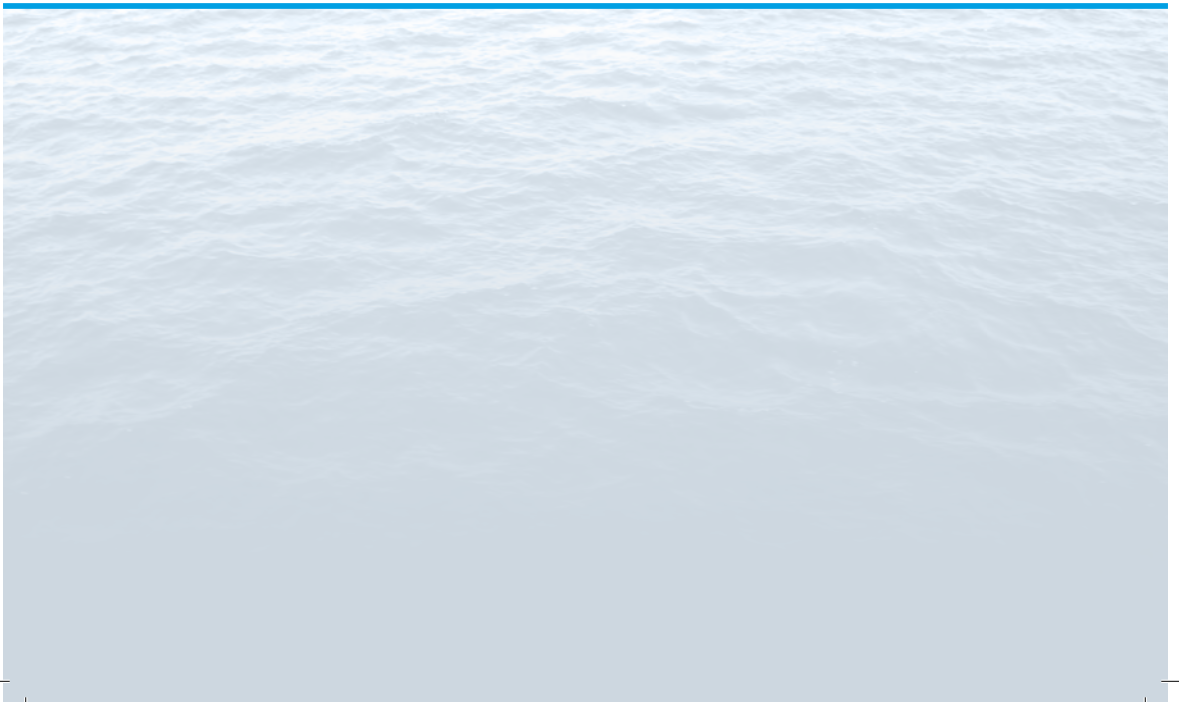


AUSTRALIAN MARITIME OPERATIONS





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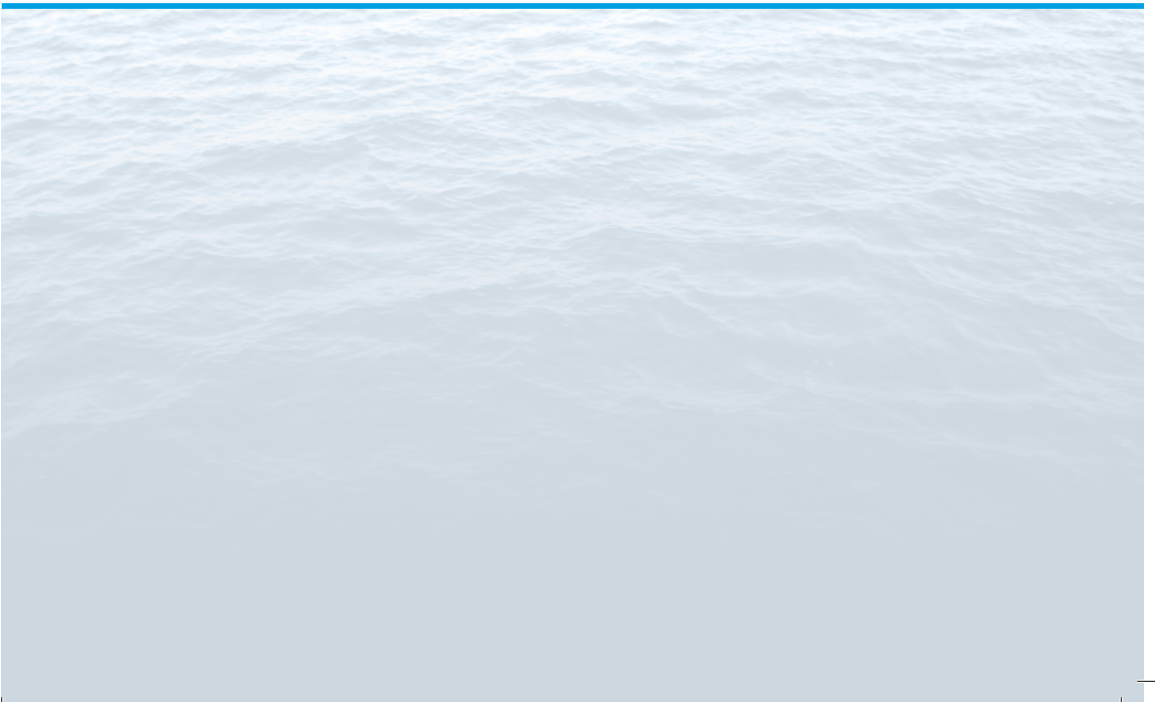
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AUSTRALIAN MARITIME OPERATIONS





FOREWORD



The 21st century is just as much a maritime century as it is an Asian century. In fact, the Asian century is maritime in nature by virtue of the region's geography. Asia's intra-regional trades and linkages are more maritime in character than those of either Europe or North America and our region has more maritime boundary disputes than any other region of the world. Australia itself is more reliant on the sea and the proper functioning of the global maritime trading system for our security and prosperity than at any time in the past. In short, we are absolutely dependent on good order at sea.

With this in mind, we must ensure that not only the members of the Royal Australian Navy, Australian Defence Force and Australian Government understand the Navy's rationale and tradecraft, but so to the broader community which we all serve.

The purpose of *Australian Maritime Operations* is to support the capstone document; *Australian Maritime Doctrine*, by providing a description of the current Navy, its capabilities, limitations and organisation. The two documents are complementary; *Australian Maritime Doctrine* describing the Navy's strategic rationale and its philosophical underpinnings, and *Australian Maritime Operations* that expands on how the Navy, and its joint and multinational partners, organise, prepare for and approach maritime operations.

The first edition of this publication, *The Navy Contribution to Australian Maritime Operations* (2005), was structured along force element group, or capability, lines. This edition takes a different approach. The first half deals primarily with the Navy's structure and governance arrangements. This serves to underpin the second half, which describes how strategic concepts outlined in *Australian Maritime Doctrine* will be used in joint, combined and multinational operations. Common to both editions, the final section comprises a set of annexes that describe the capabilities of the Royal Australian Navy.

Australian Maritime Operations is developed to suit a wide audience. It will be useful for those with a professional interest in maritime affairs, but also for those who may not completely understand how navies can be employed across the spectrum of operations.

This edition of *Australian Maritime Operations* will contribute to a greater understanding of how the Royal Australian Navy can be employed in response to the Government's direction.

TW Barrett

Vice Admiral, AO, CSC, RAN
Chief of Navy

September 2017



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INTRODUCTION

THE FACETS OF AUSTRALIAN MARITIME OPERATIONS

The Levels of Australian Doctrine

Australian Defence Force (ADF) doctrine is a hierarchy of capstone, philosophical, application and procedural doctrine. Although these different levels bear some relation to the levels of command – strategic, operational and tactical – the point at which one level of doctrine is subsumed by another is rarely clear. Furthermore, maritime warfare does not readily allow for clear distinction between these levels of command. Elements of procedural doctrine can be fundamental in all levels, just as any changes in philosophical doctrine can have ramifications elsewhere.

In the past, Australian military use of the term ‘maritime’ tended to be interpreted as meaning operations, or other activities, that involve the sea and the sea service – the Navy. The establishment of the then Headquarters Australian Theatre in the late-1990s, operations in East Timor in 1999 and the inexorable necessity to conduct joint operations since then, requires that a broader understanding of ‘maritime’ is necessary. Maritime doctrine is defined as that component of doctrine which supports the employment of armed forces at and from the sea which, like our understanding of maritime operations, is inherently joint.

Australian Maritime Doctrine

The world’s navies vary widely in how they are used to pursue their common ends; which are to advance national interests, deter war in time of peace and to undertake combat operations successfully in the event of a failure of deterrence. To explain its roles and tasks more clearly, the Royal Australian Navy (RAN) maintains two publications containing its higher level doctrine. The first, *Australian Maritime Doctrine*, contains the RAN’s capstone philosophical doctrine supporting activities at sea and explains how the RAN thinks about and prepares for employment across the broad spectrum of maritime operations. *Australian Maritime Doctrine* begins with an explanation of the fundamental importance of the Navy’s people to its operations and of the challenging physical environment in which they operate. The bulk of the publication deals with maritime strategic and operational concepts, and establishes the RAN’s place within a joint and integrated ADF. The publication concentrates on the broader strategic issues based around the selection and use of maritime forces.

Australian Maritime Operations

Australian Maritime Operations, builds on these philosophical principles and provides greater detail on how the ADF prepares for and conducts maritime operations. The first edition of this book, *The Navy Contribution to Australian Maritime Operations*, published in 2005, dealt with operations in the context of the composition and role of the Navy's major organisational elements and their capabilities, as components of the still developing joint and integrated ADF.

This edition of *Australian Maritime Operations*, takes a different approach that acknowledges the changes that have occurred in the RAN's organisation and the fact that maritime operations frequently involve several components of the Navy force structure as well as elements from other Services. This book considers the preparation for, support of and command and control of all operations. It details the range of military operations, including sea control, sea denial and maritime power projection. It also examines constabulary and diplomatic operations, and offers insights as to how new technologies, and other developments, might affect the conduct of future maritime operations. Finally, this publication explains how the other Services contribute to maritime operations and how the RAN contributes to joint and multinational operations.

Acknowledging the joint nature of maritime operations *Australian Maritime Operations* includes input from the other Services relating to operational concepts that support or rely on the RAN; such as Royal Australian Air Force (RAAF) maritime strike and maritime patrol operations and land force operations conducted from RAN ships, including amphibious concepts such as ship to objective manoeuvre (STOM). Although this edition does not cover Army operations ashore, conceptual development of integrated air and missile defence of designated shore infrastructure and expeditionary forces means that future editions will need to address this concept. *Australian Maritime Operations* also includes consideration of the support for maritime operations provided by intelligence organisations and the ADF logistics system.

Australian Maritime Operations is therefore very much a handbook on the RAN of today and its immediate future. It also addresses how each of the principal elements contributes to the conduct of maritime operations.

Relationship between the Maritime Doctrinal Publications

Doctrine must be reviewed regularly in the light of developments in theory, technology and experience. Hence, some components of maritime doctrine date from the pioneering works of the maritime school of strategic thought – authors such as Mahan, Colomb and Corbett – while others are derived from recent operational lessons. *Australian Maritime Doctrine* and *Australian Maritime Operations* contain doctrinal concepts that sustain all three Services in the maritime environment and they remain the principal works of RAN doctrine. Doctrinal publications issued by the Australian Army and the RAAF provide similar coverage of land and air strategic thought, while also focusing on their Service's contribution to joint operations.

The pace of technological change, however, will not slow and the RAN must continue to adapt to new challenges and introduce new capabilities. This publication is based on the RAN's current and planned structure; therefore, it incorporates the capabilities represented by the *Canberra* class amphibious ships, *Hobart* class guided missile destroyers and new combat helicopters. These platforms are demanding the development of significant new operating and support concepts. *Australian Maritime Operations* also examines some possible future influences on maritime operations and will thereby inform input to future Defence policy.

Both *Australian Maritime Doctrine* and *Australian Maritime Operations* are essential to understanding today's maritime operations. The doctrinal concepts they contain are authoritative, but intended for guidance and therefore must always be applied with judgment. Beneath these publications the RAN has a variety of tactical level publications that are more prescriptive and deal directly with the use of systems and processes.

Key Maritime Operational Concepts

The four key strategic concepts within *Australian Maritime Doctrine* are sea control, sea denial, maritime power projection and sea lines of communication. In *Australian Maritime Operations*, these concepts form the basis for explaining the conduct of maritime operations. Discussion of these concepts is expanded to include the types of operations that are supported by the concepts and how the RAN contributes to them as part of a joint force. The discussion in *Australian Maritime Operations* occurs primarily at the operational level and provides insights into the factors influencing these operations.

Enabling the Concepts: the Characteristics of Sea Power

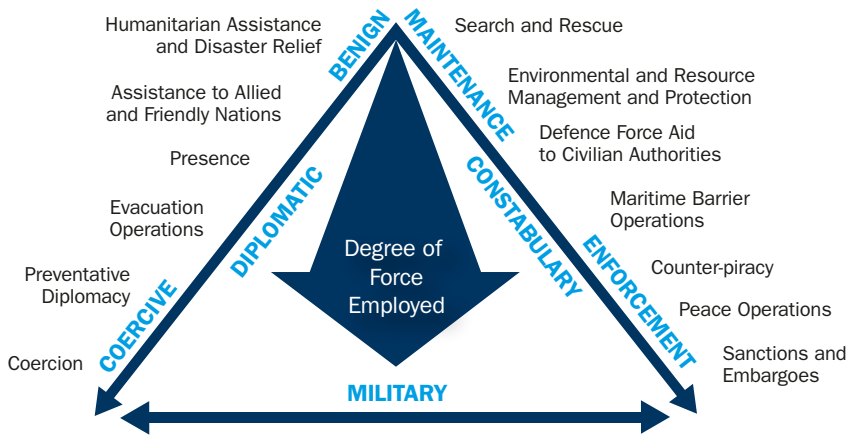
The characteristics of sea power that enable Australia's maritime doctrinal concepts are:

- mobility in mass
- readiness
- access
- flexibility
- adaptability
- sustained reach
- poise and persistence
- resilience.

These concepts are explained in *Australian Maritime Doctrine*, but need to be considered when reading *Australian Maritime Operations* because, although they may not be articulated directly, they are implicitly present in the discussion.

The Span of Maritime Tasks

The span of maritime tasks, as illustrated in Figure 1, show the relationship between the three core roles of maritime forces and their subordinate tasks. The diagram is not meant to be prescriptive, as the roles are rarely exclusive and the tasks are representative rather than specific. In reality there are always anomalies, as more than one role and several tasks may be carried out simultaneously. Although the nature of any given operation may change the foundation of this triangle on the basis of the military functions is very deliberate. The ability of warships to undertake constabulary and diplomatic roles depends substantially on their ability to carry out their military roles. The capability to do all these things is largely a by-product of the resources and core skills developed for war-fighting.



COMBAT OPERATIONS AT SEA

- Intelligence Collection and Surveillance
- Cover
- Maritime Strike and Interdiction
- Containment
- Blockade
- Barrier Operations and Defended Areas
- Layered Defence
- Advance Force Operations
- Protection of Merchant Shipping

COMBAT OPERATIONS FROM THE SEA

- Maritime Mobility (Sea Lift)
- Land Strike
- Support to Operations on Land and in the Air
- Amphibious Operations

Figure 1: The Span of Maritime Tasks

THE POTENTIAL AFFECT OF EMERGING CONCEPTS AND TECHNOLOGY ON AUSTRALIAN MARITIME DOCTRINE

Joint concepts are developing that will lead to a fully integrated ADF. Coupled with the introduction of new technologies this will affect the fundamental understandings embedded in current joint and single service doctrine. Although these concepts and technologies have yet to reach doctrinal maturity, their growing influence must be recognised and accounted for when developing or modifying future doctrine. Some of these concepts are identified below.

Information Fusion and Network Enabled Warfare

Information fusion and network enabled warfare are evolving terms used internationally to describe the way military forces intend to organise and fight in the 21st century. This has the potential to change operating cultures and procedures; through better data fusion that allows the sharing of real-time information thus enhancing force cohesion, collaboration and synchronisation, thus enabling improved situational awareness. These characteristics allow a force to act before an adversary does and to be effective in the right place, at the right time, and with the necessary capability.

This concept has the potential for generating a commonality of understanding among friendly forces, even if the extent to which its implementation may affect maritime geo-strategic realities is not yet clear. Although the advantages of networking between forces is obvious, the concept is inherently complex and has proven challenging to implement. Maritime forces rely on networking, such as tactical data links and satellite communications, and are thus well placed to take advantage of current and future developments.

By the mid 2020s the RAN is expected to be fully capable of conducting networked operations that will allow multiple remote elements, in a task force, to pool both sensor and fire control information. This creates a very powerful and detailed maritime picture that is more robust, wide-ranging and consistent than any one ship or aircraft could ever generate on its own.

Distributed Lethality

The US Navy launched a concept of distributed lethality in 2015 and it is still in the developmental stage. Instead of concentrating forces to engage an adversary and overwhelm them this concept proposes the creation of smaller offensive and adaptive force packages comprised of surface action groups with a variety of support elements. These would be dispersed and operate across a wide region to confound adversary locating and targeting while introducing a threat to their sea lines of communication.

Hybrid Warfare

This concept involves the use, by an adversary, of insurgent techniques, non-military forces (i.e. police or customs officers) or non-uniformed forces in military operations, and the use of social networks and information warfare to spread propaganda and inflammatory rumours to cause destabilisation; thus causing uncertainty in the so called grey zones of conflict. This has and continues to occur in land operations but indications are this may spill over in to maritime operations.

Theatre Anti Submarine Warfare

Theatre anti-submarine warfare (TASW) is the conduct of wide area ASW within Australia's area of interest or any designated joint force area of operation (but outside any maritime task group operating area). A key feature of TASW is the conduct of surveillance, detection, localisation, tracking and, if required, the prosecution of a submarine using intelligence and long range sensors. Ultimately the focus is to reduce the cue-detect-localise-classify-track-attack chain through the integrated use of strategic intelligence systems, information activities, fixed, deployable or mobile off-board sensors and the operation of forward-deployed air, surface and sub surface ASW force elements. Since the 1990s ASW has shifted from the deep water open ocean to the littorals and detection of modern diesel electric submarines in shallow waters, especially archipelagoes, is very difficult. The locating and destruction of an adversaries submarine has, and always will be, a protracted activity that often requires a disproportionate amount of resources to undertake.

Sea-Basing

The potential that the concept of sea-basing offers to allow flexible amphibious support and reduce the logistics footprint ashore is attractive. The acceptance into service of new amphibious and sea lift ships, together with their supporting landing craft and helicopters, provides additional capacity to support operations ashore from the sea.

Ballistic Missile Defence and Command and Control

The increase in range, speed and accuracy of ballistic missiles, coupled with the ability for these weapons to be countered from sea-based platforms, continues to be a focus of maritime capability development. The challenges surrounding these developments will require continual monitoring and assessment.

Naval Gunfire

It can be expected that the range, lethality and precision of ship's guns will increase in the future. This will significantly enhance ship capabilities in ship to ship and ship to shore engagement. The ongoing improvements to ships guns, munitions and propellants will increase both the distance that projectiles can be fired over as well as the speed they will travel. The recent trials of mega-joule rail guns could, in the future, negate the need for traditional chemical propellants, to fire projectiles, to be carried on board ships.

Unmanned Systems

The possible uses for unmanned aerial and underwater systems continues to expand. This has increased legal and ethical concerns, particularly if these autonomous weapons were to conduct attacks without human decision making or over-ride being involved.

Cyber Warfare

The 21st century has seen an exponential growth in cyber capabilities. Just as wireless and radio communication, in the early 20th century, changed the speed at which warfare could be conducted and the effects that could be generated, so will cyber warfare have its own effect on future maritime operations. The ongoing influence of cyber warfare on emerging doctrine will require close analysis.

Conclusion

This edition of *Australian Maritime Operations* has evolved from the earlier publication and now represents an expression of the RAN's approach to maritime operations based on current and projected force structure, together with well-accepted doctrinal concepts.

This book is designed to be read not only by those in the RAN, and other elements of the ADF who have a direct professional concern, but also by those with an interest and concern for the issues of Australian security and maritime affairs. There are a number of terms used which the reader may not be familiar with and a substantial glossary is provided at the back of the book to assist with better understanding of the key concepts and issues.

Equally important are your thoughts on this document and any suggested changes or additions that should be incorporated in future editions. Readers are encouraged to submit proposed amendments to *Australian Maritime Operations* to:

Director
Sea Power Centre - Australia
Department of Defence
PO Box 7942
Canberra BC ACT 2610



1. ORGANISATION

- The Chief of the Defence Force commands the ADF and delegates command of the Royal Australian Navy to the Chief of Navy.
- The Chief of Navy is responsible for raising, training and sustaining naval forces at levels fit for the required purposes.
- The Chief of Navy has subordinate commanders and organisations.
- Navy Strategic Command and Fleet Command exist to support the Chief of Navy in the command of the Royal Australian Navy.

An effective organisation is fundamental to the efficiency of the RAN and its ability to accomplish assigned missions. The objective of the RAN's structure is to align the entire Service, and its supporting agencies, into a system that is focused on the delivery of trained forces and the necessary support to deliver combat capability. Ultimately the Navy's mission is to fight and win at sea.

The Chief of Navy commands the Navy and is responsible for raising, training and sustaining the RAN. Under the Chief of Navy there are two major commands. These are:

- Navy Strategic Command
- Fleet Command.

RESPONSIBILITIES

Chief of Navy

The Chief of Navy (CN) has overall command of the RAN and all uniformed naval personnel, regardless of where they work in Defence. Additionally the Chief of Navy is the principal naval adviser on strategic affairs and provides advice to the Chief of the Defence Force (CDF) on current capability, military affairs and future capability development; and also represents the RAN on various higher defence committees.

The Chief of Navy is responsible to CDF, and the Secretary of the Department of Defence, for:

- providing naval forces that:
 - contribute to the ADF's capability to ensure the defence of Australia and its direct approaches
 - contribute to the security of Australia's nearer region

- support Australia's wider regional interests and a rules based global order
- raising, training and sustaining naval forces by proper stewardship of human, financial and environmental resources
- providing timely and accurate advice to the government on strategic direction and military capability of both the current and future force.

The Chief of Navy delegates responsibilities to five principal subordinates within Navy Strategic Command and Fleet Command. These are:

- Deputy Chief of Navy and Head Navy People Training and Resources (DCN / HNPTAR)
- Head Navy Capability (HNC)
- Head Navy Engineering Regulation, Certification and Safety (HNE)
- Commander Australian Fleet (COMAUSFLT or Fleet Commander)
- Warrant Officer of the Navy (WO-N).

Navy Strategic Command

Navy Strategic Command exists to provide the Navy's strategic direction.

Deputy Chief of Navy and Head Navy People Training and Resources. DCN/HNPTAR has two parallel sets of responsibilities. First, as the manager of Navy Strategic Command they are responsible for the alignment of accountability, responsibility, performance and resource management within the RAN. Second they are responsible for managing the Navy's uniformed integrated workforce (both permanent and reserve personnel) and members of the Australian Public Service. Commodore Training (COMTRAIN) reports to DCN and is responsible for individual and ship level training.

Head Navy Capability. This position is responsible for implementation of both current and future Navy capability, including all Navy programs/projects (both major and minor) from concept through to acquisition, in service use and ultimately disposal of the system.

Head Navy Engineering Regulation, Certification and Safety. This position is responsible to CN for Naval engineering and maintenance discipline upkeep, Navy safety management governance, Fleet Support Unit strategic management; and the design, implementation and upkeep of the Defence Seaworthiness Management System.

Warrant Officer of the Navy. (WO-N) This position is the most senior ranking sailor in the Navy and may exercise command over all RAN sailors. WO-N is responsible to CN for representing the views, concerns and opinions of the Navy's sailors.

Fleet Command

Fleet Command is responsible for the force generation of naval elements for subsequent employment on operations by the Chief of Joint Operations (CJOPS). This responsibility includes group training (i.e. task group level) and the naval aspects of joint collective training (defence elements from services working as a joint task group or force) together with the mounting process to provide assurance that the required level of capability has been met.

Commander Australian Fleet. The Fleet Commander is the primary operations advisor to the Chief of Navy. Additionally CN has delegated full command of all of the RAN's ships, submarines, aircraft squadrons, diving teams and shore establishments to the Fleet Commander, who is responsible for force generation. This includes the group and joint collective training of fleet units and overseeing the maintenance and support of ships, aircraft and other equipment, to enable the fleet to reach and maintain required levels of readiness.

The Fleet Commander exercises command of shore establishments through Commander Shore Force (COMSHORE) and delegates operational command of units to the various force commanders. Operational control of fleet units will usually be delegated to the Director General Maritime Operations (DGMAROPS), with tactical command either held by DGMAROPS or delegated to Commodore Warfare (COMWAR), a subordinate tactical warfare commander, a nominated Commander Task Group (CTG) or ship's commanding officer, depending on circumstances.

When naval forces are needed for joint, multinational or other specific operations CDF will direct the Chief of Navy to assign those forces to CJOPS. At all other times these forces will be available for training, and other activities, as directed by the Fleet Commander. Within Fleet Command, responsibilities are delegated to a number of senior officers. These are:

- Director General Maritime Operations (DGMAROPS)
- Commodore Warfare (COMWAR)
- Force Commanders.

Director General Maritime Operations. This position is responsible to the Fleet Commander but located in Headquarters Joint Operations Command (HQJOC). DGMAROPS is responsible primarily for:

- providing advice on the raise, train and sustain functions to the Fleet Commander, especially as it relates to preparedness management within the fleet
- exercising operational control/tactical command of force elements once delegated by the force commanders.

DGMAROPS has oversight of the Maritime Operations Centre (MOC) located within HQJOC. The MOC coordinates the execution of all maritime activities and operations conducted by fleet units that are not assigned to a designated Joint Task Force (JTF) commander. DGMAROPS exercises operational control of all RAN units at sea and tactical command of 'routine activities' that are below the threshold where a JTF is required. DGMAROPS also has responsibility as the Navy Submarine Operating Authority (SUBOPAETH) and development of the Navy Activity Schedule (NAS) – the executive document that articulates the Navy's priorities.

Commodore Warfare. This position comprises three discrete functions: the fleet battle staff, the Force Generation Division and the Australian Maritime Warfare Centre. COMWAR is also:

- the Navy lead for core maritime warfare skills regeneration
- the Navy fighter controller capability manager
- responsible to CJOPS for maritime joint force headquarters tasks.

The Australian Fleet Battle Staff. The fleet battle staff command large multinational naval and amphibious task groups and provide the ADF with this core tactical maritime expertise, which can be adapted to a wide variety of situations. They also provide an overall planning capability for sea control operations with input from amphibious or mine warfare and clearance diving tactical warfare commanders' staffs. Elements of these staffs will operate afloat or ashore as necessary throughout an operation.

The Australian Maritime Warfare Centre. This centre is responsible for maritime warfare policy, joint doctrine and tactics. Further responsibilities include:

- The Maritime Warfare Program (war-fighting improvement program)
- Fleet Cross Force Capability Division
- Signature Analysis and Ranging
- Weapon System Performance
- Operational Analysis (Defence Science and Technology Group)
- Fleet Operational Knowledge Exploitation Cell.

Force Commanders. The Fleet Commander has delegated operational command to the respective force commanders. They are thus responsible for force generation and preparation of all units and personnel under their command. These responsibilities include coordination and management of all aspects of capability management, including the fundamental inputs to capability. They also include the development and implementation of policy related to their individual forces. The force commanders will delegate operational control of units to DGMAROPS as required. The five force commanders are:

- Commander Surface Force
- Commander Submarine Force
- Commander Fleet Air Arm
- Commander Mine Warfare, Hydrographic and Patrol Forces
- Commander Shore Force.

Commander Surface Force. This position is responsible for the capability management of the RAN's destroyers, frigates, amphibious and afloat support vessels. Additionally they are responsible for surface force input to the development of future capabilities.

Commander Submarine Force. This position is responsible for the capability management of the RAN's submarine force. Additionally they are responsible for submarine input to the development of future capabilities.

Commander Fleet Air Arm. This position is responsible for the capability management of naval aviation and the development, oversight and regulation of operational airworthiness standards for RAN aircraft. Additionally they are responsible for naval aviation input to the development of future capabilities.

Commander Mine Warfare, Clearance Diving, Hydrographic, Meteorological and Patrol Forces. This position is responsible for the capability management of the RAN's mine warfare, hydrographic and patrol forces. They have responsibility for mine warfare, hydrographic and patrol force input to the development of future capabilities. Additionally the Australian Hydrographic Service (AHS) supports the national charting responsibilities and publishes Australia's nautical charts and associated publications.

Commander Shore Force. This position delivers shore force capability including naval facilities, infrastructure and port services in compliance with seaworthiness requirements. Additionally they provide Navy policy to meet Defence preparedness requirements and management of the relationship with the Defence Estate and Infrastructure Group (DEIG) for matters such as garrison support.

More information on each of the forces can be found in Annexes A-E.



2. OPERATIONAL PLANNING

- Operational planning is the art of transforming national strategic intent into detailed, synchronised plans for the employment of maritime forces.
- The unique nature of the maritime domain requires an understanding of the factors influencing maritime operations that must, in turn, be incorporated into operational plans.
- The potential for battle damage, casualties and losses is an inescapable fact of conflict and underpins the importance of risk assessment in operational planning.

WHY DO WE PLAN?

Plans are developed at various levels of command in response to developing contingencies, crises and everyday events. Although a similar process is followed in developing any plan, the level of detail varies according to the level of action required. Operational level planning is usually focused on the operational art, or how to employ maritime forces to attain strategic goals as directed by Government. The aim of operational planning is to transform national strategic objectives and military strategic plans into carefully detailed activities for maritime forces including mobilisation, deployment, employment and reconstitution.

An operational plan seeks to integrate joint force requirements into a cohesive scheme of manoeuvre that meets the strategic goals. This plan forms the basis of orders to subordinate commands on how to achieve the goals and the expected timings, pre-conditions and conditions to be met. The synchronisation of the maritime plan to that of air and land requirements is the art of operational planning.

It is essential that there is clear strategic guidance and frequent interaction between senior leaders and planners so as to promote a united understanding of the complex operational problem presented. The strategic guidance for operational plans comes down from two higher levels: national strategic objectives and military strategic plans.

The government's national strategic objectives are derived from a consideration of the security, economic, domestic and international political, social and cultural dimensions of an issue. The government considers the mobilisation of national diplomatic, information, military and economic instruments of power to provide the essential elements to resolve a situation and achieve the national aim. National strategic objectives are primarily evolved from the National Security Committee of Cabinet and provide purpose and focus to the planning for the employment of military force.

The military strategic plan takes the national strategic objectives and provides high level guidance to achieve these objectives. It refers to military operations and formulates the desired military end states and some broad military approaches to achieving these end states. These plans involve the CDF, Secretary and other senior Defence personnel in consultation with other government departments. As operational plans are developed the planners need to understand that there are two broad types of military strategic planning: developmental planning, which is used for force development and guidance; and operational planning, which is for specific operations.

When Do We Plan?

The ADF conducts operational planning, which is further divided into two types: deliberate and immediate.

Deliberate planning involves 'planning for the possible'. It encompasses the preparation of plans in situations remote from crises. It is used to start the development of detailed plans for the employment of the military on a broad range of activities based on identified requirements. It uses a mixture of assumption based planning, current strategic guidance and possible future environments to develop considered military strategic guidance.

Immediate planning is based on dynamic real world conditions. It is planning for the 'likely or certain' and is situation dependent. Immediate planning encompasses the activities associated with the time-sensitive development of orders for the deployment, employment, and sustainment of forces and capabilities, in response to a situation that may result in military operations. It must provide for the rapid and effective exchange of information and analysis so that there can be a timely preparation of possible military courses of action. Immediate planning may be performed sequentially or in parallel with deliberate planning.

Creating a Plan

To create a plan the commander and their staffs apply operational art (skilful use of forces) to operational design (the joint military appreciation process). Planners apply operational design to provide a conceptual framework that influences their plans and the subsequent execution of the plan. They combine operational art and science (real data such as distances, weapon ranges, fuel usage rates, etc) to develop products that describe how (the ways) a force will employ its capabilities (the means) to achieve the desired military end state. The interaction of operational art and operational design provides a bridge between strategic intent and tactical action, linking national strategic aims to tactical combat and non-combat operations that must be executed to accomplish these aims.

The application of operational art and operational design further reduces uncertainty and adequately brings order to complex problems enabling more detailed planning. The commander is the central figure in operational art because the commander's judgment and decisions are required to guide their staff through the process. Commanders use their education and experience to compare similarities in their current situation with their own experiences and knowledge of military history to distinguish the unique features that require innovative or adaptive solutions.

Strategic guidance, that details politico-military assessments, enables planning staff to apply the military strategy and objectives and the apportionment and allocation of forces and other resources for the commander. Thereafter, planners can formulate concepts and develop guidance leading to the preparation of courses of action.

The concept development stage usually involves application of the joint military appreciation process. At this stage planning staff develop several courses of action, each containing an initial concept that identifies the major capabilities required, and subsequent task organisation, major operational tasks to be accomplished, a concept of employment and risk assessment. Each course of action should contain options that describe alternatives to accomplish designated end states should conditions change (such as operational, environmental, emerging problems and strategic direction).

Once this process is complete and the commander selects a course of action, plan development can take place to develop full operational plans and the subsequent orders. The plan should detail how a commander is going to shape the operational environment, destroy, deter or dominate the adversary, seize the initiative, stabilise the situation and reconstitute the force. The plan should also integrate the mobilisation, deployment, employment, sustainment, conflict termination and reconstitution cycle, ensuring that all aspects are considered and accounted for.

The Maritime Factors Influencing the Planning Process

Culturally, ships, submarines and aircraft tend to be seen as the 'teeth' in maritime warfare, and 'shore support' is viewed as the 'tail'. Yet intelligence and data fusion, command and control, logistics and other support functions must be recognised as core components. Operational success demands an understanding of the unique maritime factors in a plan and the application of two key points in the planning process.

First, war at sea may involve the application of a decisive offensive force to achieve sea control. In modern warfare the accuracy, lethality and range of contemporary weaponry favours the force that has superior intelligence, surveillance and reconnaissance (ISR) to detect and neutralise an adversary outside their own weapon engagement range. Shaping operations in the maritime domain should attempt to attrite adversary forces prior to any force-on-force activity. Naval engagements between heavily armed and armoured warships have given way to short, sharp and highly destructive combat that may have been preceded by periods of increasing tension and substantial diplomatic effort to avert conflict or mitigate its affect. The ability to engage decisively remains paramount for maritime forces. War at sea emphasises the offensive, bringing to bear information, intelligence and tactical initiative against an adversary.

The second key point, concerns the extension of our maritime influence through power projection over the shore. An amphibious capability is an integral naval component of most maritime forces, and in Australia's region, control of the sea's is invariably a prerequisite for larger plans with a land-based objective. Maritime forces convey land forces, and materiel, to the area of interest and can provide a mobile base from which to conduct military operations ashore. Naval forces may be tasked to spearhead maritime power projection as part of a joint task force and take the battle directly to the adversary. This means applying high-intensity, precise, offensive power at the time and place of our choosing.

The application of operational art in operational planning is essential when considering the maritime domain. The following details some of the historically important maritime aspects of operational planning.

Networked operations. Although often viewed as a product of the information age, networked operations at sea have been common for centuries. Planning to maximise networking capabilities requires careful consideration and training so that information can be used for decision making or engagements. This information can be transferred via a variety of means including real-time data-links.

Command and control. Maritime operations may occur either on the open ocean, or in the complex littoral regions. These operations involve the direction and coordination of actions in all the physical warfare domains and across the electromagnetic spectrum. A commander needs to retain robust methods of dealing with changing situations, often in a variety of operational spheres, while striving to maintain the aim. This central goal must allow those who are facing the immediate problem to make rapid decisions, while retaining a degree of control. In response, the principle of centralised direction and de-centralised execution has developed.

Centralised direction is essential in producing a cohesive plan for achieving the common aim. It is also important if there is a need to reorient or alter a plan to reflect changing circumstances. De-centralised execution is also essential, as there is a limit to the number of spheres of warfare over which a commander can comprehensively exercise personal

control. Subordinate commanders must be given the freedom to use initiative and to act within the bounds of the overall concept of operations. The commander needs to know what is happening and why, as soon as possible, so that they can provide complementary support or adapt the plan as events dictate. There is no set level to which this de-centralisation should go and it depends on the overall effect a commander wishes to achieve. Initiative is preferable to inaction, and commanders should encourage this and avoid over management of their subordinates.

Intelligence and surveillance. Successful maritime operations rely on a commander establishing and maintaining a clear picture of the operational environment. The recognised maritime picture (RMP) is the combination of a vast array of information to give a commander the clearest possible picture of the disposition of own, adversary and neutral forces, their current operational status and the operating environment. The collation of information starts well before any planning and covers factors such as geographic area and sea characteristics, climatic conditions and seasonal issues. It also includes strategic intelligence on a potential adversary's cultural, economic, information, political and military capabilities.

This information is used to educate and focus planners on the adversary. The commander and subordinates can use this information, combined with tactical intelligence and situational awareness, to make decisions and act appropriately, even when tactical information is not complete. In doing this a commander does not become reliant on tactical intelligence driving their decision making; rather they can be more confident, through de-centralised execution, of seizing the initiative when opportunity presents.

Rapid environmental assessment. The physical environment has an ongoing and powerful effect on the nature and conduct of operations. Commanders have long realised the interdependence between the nature of the physical environment and their success, or failure, in battle. The commander who has a deep appreciation of the shape, type and variability of environmental conditions, within the maritime domain, will always have a better understanding of the nature of combat and a significant advantage over a less knowledgeable adversary. Accurate and timely geospatial support is therefore a key factor in assisting commanders to gain a better appreciation of the physical domains influence on operations, and a fundamental enabler to situational understanding.

Rapid environmental assessment (REA) refers to the process of direction, collection, processing and dissemination of relevant information to provide a comprehensive and thorough understanding of the operational environment. It provides the underlying environmental data and information required to produce the recognised environmental picture to support the generation of mission-specific environmental products.

Balance of advantage and protection. The destruction of an adversary's forces is not necessarily the overriding factor in maritime combat operations. The mission will be guided by strategic intent and national policy, governing the use of force, that will be articulated in promulgated rules of engagement. Mission success may be achieved through the use of deterrence, dislocation, distraction, disruption or deception. Risks to one's own forces must always be considered. Western societal attitudes to combat losses are changing, yet the likelihood of battle damage and casualties is an inescapable fact of conflict and underpins the importance of risk assessment in operational planning.

Dominating the battle. Whether by the direct application of combat power or by influencing the operational environment, dominating the battle must be the commander's ultimate consideration. Domination does not necessarily require a numerically superior force, rather it relates to using the available capabilities to their best advantage. This demands that systems are maintained at peak performance and they are operated to their limits by well trained, resilient and highly motivated personnel to ensure the destruction, dislocation, distraction, disruption or deception of an adversary. It also requires accurate and timely intelligence so that any relative weakness in an opponent may be recognised and exploited.

Logistics. Logistic support allows a force to move, and be maintained, and as such is a key enabler. It is integral to all parts of the operational plan, since sustained operations cannot be achieved without a responsive and reliable logistics supply chain. Although priority must be given to the main effort, all force elements must remain adequately supported to ensure mission success. Lines of communication need to be identified early in planning to ensure that logistics support remains secure throughout an operation. Another key factor in logistics planning is the need for ship repair and rotation. Although by their nature ships are able to remain on station for extended periods, maintenance and repair in an operational area needs to be carefully managed, as depot level maintenance is usually not achievable. Over time ships, their crews and other personnel need to be rotated out of the operational area to maintain a high level of fighting efficiency.

Assessing the Plan

Continual assessment is the critical final element of planning. Given the fluid nature of armed conflict and the dynamic operational environment, planners must constantly reassess the unfolding situation to ensure that actions remain effective and relevant.





3. COMMAND AND CONTROL

- The term command and control describes the system that empowers designated commanders to exercise lawful authority and direction over assigned forces for the accomplishment of missions and tasks.
- The command and control infrastructure required to support the ADF needs to be effective in joint and multi-national environments.
- Command and control is executed at the strategic, operational and tactical levels.

Military operations are commanded and controlled through formal and legally based arrangements that are designed to be unambiguous, flexible and efficient. Command and control is the system which empowers designated personnel to exercise lawful authority and direction over assigned forces for the accomplishment of missions and tasks. Command and control is executed at the strategic, operational and tactical levels.

Command is the legal and organisational authority that gives an individual authority over other ADF members and Defence civilians. Control is the authority exercised by a commander over part of the activities of subordinate organisations, or other organisations not normally under their command, which encompasses the responsibility for implementing orders or directives. All or part of this authority may be transferred or delegated. Command and control is thus the term used to describe the system that empowers designated commanders to exercise lawful authority and direction over assigned forces for the accomplishment of missions and tasks.

Command in the RAN has traditionally been focused on command at sea and, before the advent of real-time, long-range communications, commanding officers relied on being given broad direction from higher command. They were then able to exercise considerable independence in whatever situation arose. Today, however, the use of computerised command support systems has revolutionised the quality and quantity of information available to commanders and the speed with which they are able to direct their subordinates.

Ongoing changes in the organisation and management structures of the ADF and operational tempo have not, however, altered the fundamental responsibility of command. Commanding officers still require sufficient flexibility to enable effective decision-making. They remain individually accountable for their decisions and actions.

They have a responsibility to encourage, mentor, discipline, lead and care for those under their command. The challenge is to meet these command responsibilities in an environment subject to information overload, under close oversight by political and military superiors, and where tactical decisions may possibly have unforeseen strategic consequences.

In general terms, commanders exercise their authority personally through the issue of orders, directives or instructions, the detail of which is prepared by their staff, including technical experts. These orders, directives and instructions may be issued electronically, face to face, in writing or by voice communications.

Command is a personal matter in which the command philosophy of individual commanders cannot avoid influencing both their own life and work and those of their subordinates. An effective command philosophy should therefore:

- define the aspects of organisational activity most important to a commander
- give insight into the commander's leadership style, so that others can synchronise their actions
- be broad enough to provide reference points for an ethical, personal leadership/managerial style
- provide a foundation of understanding by which a commander and their subordinates can build a relationship of respect, trust and mutual expectation.

The ADF's command and control infrastructure needs to be effective in both joint and multinational environments. It must also be flexible enough to suit the range of tasks required by Government whilst being adaptable so that each of the Service's can achieve dominance in its own combat area. RAN command and control arrangements take into account these requirements, and have been strengthened to meet the complexity of the future operating environment.

ADF COMMAND AND CONTROL ARRANGEMENTS

Command in the ADF is based on Commonwealth legislation and is legally vested in CDF. The CDF delegates command to the Chief of Navy, Chief of Army, Chief of Air Force and other senior officers when required. In exercising their authority, commanders draw on information, advice and support from organisations outside their immediate chain of command (as a result of the support and structural arrangements that flow from the different powers and responsibilities of CDF and the Secretary of the Department of Defence).

Strategic Level of Command

All Australian defence activities are governed by the cardinal principle of control of the ADF by the civil authority, in the form of the duly elected Government. Consequently, command at the national strategic level is the exclusive province of the Government, acting independently or together with other governments. The national strategic level is concerned with the employment of power to secure national objectives. Within the ADF, command is exercised at the military strategic level by CDF, assisted by CJOPS, Vice Chief of the Defence Force and the Service chiefs, who command their own Services except for those forces required by CDF for operations. At this level, CDF is mainly concerned with the use of military resources to achieve national strategic objectives.

Operational Level of Command

Command at the operational level is concerned with the planning and conduct of ADF campaigns, operations and other activities as directed by CDF. This is the primary responsibility of CJOPS who provides direction and resources to the force elements taking military action. The operational level commander links military strategic objectives with all tactical activity in a theatre, and directs military resources to achieve the desired end state. The focus of command at the operational level is on forming a joint force, deploying it to the area of operations, sustaining the force, allocating resources and providing guidance to achieve strategic objectives and effects.

Chief of Joint Operations

CJOPS exercises theatre command through the Deputy Chief of Joint Operations within HQJOC. Joint Operations Command (JOC) consists of HQJOC and seven branches: Support, Intelligence, Operations, Plans, Command and Information Systems, the Australian Defence Simulation and Training Centre, and Experimentation and Assessment. Also embedded in HQJOC are maritime and air operations which have responsibility to CJOPS for operational aspects and to their respective service chiefs for the raise, train and sustain function. Units under direct command of JOC include: Northern Command, 1st Joint Movements Group and Maritime Border Command (MBC), as well as assigned forces and Joint Task Forces (JTF) when raised.

A JTF will be established for all ADF operations, noting that all supporting capabilities, including HQJOC, are joint. A JTF may also be needed to coordinate its efforts with the Services or those of a government agency or a non-governmental organisation. It will be commanded by a designated Commander JTF (CJTF). For a maritime-led JTF, the commander will normally be Commodore Warfare (COMWAR) or one of their subordinate tactical warfare commanders.

A JTF may have subordinate structures within it, including single service tactical organisations such as a naval task group, joint forces assembled into domain or functional components, or even a subordinate JTF.

Commander Maritime Border Command

MBC is a multi-agency task force which uses assets from both the Australian Border Force (ABF) and the ADF to safeguard Australia's maritime jurisdiction. It is also able to call on the support of other agencies as required. MBC is the Australian Government's lead organisation for offshore security and undertakes planning, preparedness, prevention, response, and recovery related maritime security activities, including responses to terrorism threats or incidents originating from Australia's maritime domain.

The Commander MBC is a two star ranked officer who commands and manages MBC under a joint ADF/ABF directive. The Commander MBC is responsible to CDF through CJOPS, as Commander JTF 639. As such, Commander MBC is responsible for:

- conducting surveillance and coordinating maritime response in the Australian Exclusive Economic Zone (EEZ) and adjacent areas
- preparing, supporting and/or commanding directed offshore maritime, joint and specified operations to defend Australia and its interests.

Commander MBC is responsible to the ABF Commissioner for the planning and execution of the civil-maritime surveillance program and for the coordination of any surface response in support of this program.

Tactical Level of Command

The majority of ADF forces operate at the tactical level where engagements are planned and executed to meet the operational objectives set by CJOPS. This is the level at which forces meet an adversary, thereby placing different pressures on commanders. Warships and force elements assigned to an operation will typically be formed into a task organisation. A dedicated staff will be formed to support a task group commander and its purview will inevitably straddle the operational and tactical levels.

Overlapping Levels of Command

Planning at the strategic, operational and tactical levels is closely linked and interdependent. There is often no clear delineation between the three levels, but instead they overlap. In recent operations an increasing number of military actions have generated both desirable and undesirable strategic level effects and outcomes. Consequently, actions taken at the tactical level may need to be especially responsive to strategic decision making. Each command level is very reliant on the rapid flow of accurate information and clear direction.

One of the potential outcomes of command overlap is an undermining of the command structure. This can be avoided through a balanced approach that aims to avoid micro-management by senior commanders through an excessive reliance on high data rate communications.

Assignment of Forces to Operations

When required for joint, multinational or specific operations, CDF will direct the service chiefs to assign assets to CJOPS. When not assigned, naval forces are available for raise, train and sustain activities as directed by the Fleet Commander, who will exercise operational command for deployed units, unless directed otherwise by the Chief of Navy.

COMMAND WITHIN THE RAN

CDF commands the ADF, which has adopted a joint approach to most of its activities. Nevertheless, there is widespread recognition that to contribute effectively in joint operations the RAN, Australian Army and Royal Australian Air Force (RAAF) must maintain professional mastery in their own combat environments. RAN personnel may exercise command in both joint and RAN operations and conversely may be commanded by Army and RAAF personnel in joint operations.

Every member of the Navy has the potential to exercise command by virtue either of the rank they hold or the appointment they fill. The nature and scope of authority varies from appointment to appointment and increases with rank. The command of task groups, ships, submarines, aircraft squadrons and clearance diving teams can only be exercised by those possessing the specialist qualifications to do so. Command is vested in the officer posted in command by the Chief of Navy.

Authority derived from an appointment is specific in nature and is related to the responsibilities of that posting. Authority due to rank is accorded to each member of the ADF based on their status within the rank structure of their Service and the level of responsibility appointed to particular positions within the organisation. The more senior officers in roles requiring them to exercise command over large numbers of personnel are customarily called 'commanders' but, strictly speaking, the term can be applied to any member of the RAN exercising military authority over their subordinates.

The definition of command makes it clear that it encompasses an inherent sense of individual responsibility and accountability. It is the commander who must be prepared to lead, make decisions, encourage, mentor, discipline, direct, control and care for those under their command and be accountable for their actions. There is also an implicit obligation on the RAN to ensure that commanders are adequately prepared for the task through prior career management.

Full command is vested only in CDF who then delegates command to the three service chiefs and selected other officers. They in turn will delegate lesser levels of command/control to subordinates. These levels, in descending order of priority and authority, are operational command, operational control, tactical command and tactical control. Linked to each is administrative control, technical control and logistics control which can be retained at the higher level (i.e. CJOPS may be given operational command of a ship but technical control is retained by the Fleet Commander to ensure that technical regulations are adhered to).

A non-ADF multi-national force commander may be given tactical command of ADF units, but this would normally be the highest level of command delegated. In such a case an ADF officer would be given national command allowing them to provide oversight of each unit's employment. This ensures national rules and regulations, such as Rules of Engagement, are adhered to and this is effectively the right to veto activities not in the Australian Government's interest.

Task Group Command

Task group command may be exercised by COMWAR, as Commander Fleet Battle Staff; by a tactical warfare commander, a nominated commander task group (CTG); or by an individual commanding officer.

Commodore Warfare

COMWAR is responsible for the fleet battle staff and for the Australian Maritime Warfare Centre. The fleet battle staff plan and execute force employment at the tactical level when assigned, and when COMWAR acts as the Maritime Component Commander of a deployed joint force headquarters. Thus, COMWAR is responsible for planning, conducting and commanding maritime operations and exercises at the tactical level as directed by CJOPS and for conducting raise, train and sustain exercises when directed by the Fleet Commander.

An Australian Perspective

As a general observation, the RAN and some partners have tended to prefer command by delegation over tighter forms of command during operations in the Middle East, and this is generally the manner in which our people have led operations as task group and task force commanders. Under this concept, we have sought to provide on-scene commanders with a greater degree of discretion to assess circumstances and act within the boundaries of broader guidance. Employing this approach, we have endeavoured to act as a robust interface between units at sea and higher coalition headquarters, with the aim of leveraging an on-scene commanders' inherent ability to act most appropriately given their more intimate understanding of the situation. Without ignoring the direction of senior commanders, we believe we have generally achieved sound outcomes and strong trust with units operating under our tactical control. At the same time, however, we have certainly learned about the 'speed' of command and control that can be achieved through capabilities such as high-data rate communications and modern information technology.

Rear Admiral Greg Sammut, RAN

Role of the Task Group Commander

The commander of the task group (CTG) deals with a broad range of issues spanning the operational, strategic and tactical levels. Possibly the greatest challenge is creating a clear chain of command with effective information support. At a basic level the CTG is appointed for a specific mission and is equipped effectively to maintain command of that mission for extended periods. They may also have responsibilities to work-up assigned force elements for a particular operation or exercise and, as the senior officer, has responsibility for the performance of assigned units. The CTG may delegate command of the task group to the commanding officer of another ship.

Maritime Component Command

The direct method of command in which a CJTF exercises command directly over assigned forces is best suited to operations of limited scale and intensity. In other circumstances, forces can be divided into components, each with its own commander who acts consistently with the CJTF's broad direction. Component commanders are collocated with the CJTF and require staff and command facilities support. Where a maritime component is formed, COMWAR normally acts as the Maritime Component Commander.

Combined Maritime Force

In 2009-10 I was working for the Commander Combined Maritime Force, who was also a US National Commander as Commander US 5th Fleet. Similarly I was a deployed Commander of an Australian Task Group and I remained at all times under the national command of the Australian Commander of Joint Task Force 633 which was initially General Mark Kelly and then General John Cantwell. Thus it was challenging from a leadership perspective.

It may not be fashionable to say, but the maritime command positions in the region, as exemplified by Combined Task Force 150, are arguably our most strategic command. It is the one command that covers the broad canvas of the Middle East and Indian Ocean, outside of Afghanistan. Direct interaction, visits, exercises and high level diplomatic talks occur with senior people and operational personnel of countries such as the Kingdom of Saudi Arabia, Kuwait, Oman, the United Arab Emirates, Bahrain, Yemen, Jordan and Pakistan. My team was working every day, side-by-side, within the Combined Maritime Force of 24 nations and US 5th Fleet Command. We were making significant gains in working with the nations of the region to assist them to counter the dangers presented by a tense and dynamic strategic, operational, cultural, religious and legal situation. We were engaged on a personal basis with chiefs of navy and senior parts of government and all our interaction occurred with the relevant Australian ambassador and Defence Attaché present - now that is true strategic effect and access.

Commodore Richard Menhinick, RAN

Tactical Warfare Commanders

RAN tactical warfare commanders exist to command the surface, amphibious, and mine warfare and clearance diving task groups. Their focus is on planning, execution and command of operations. This involves a range of tactical, operational and sometimes strategic issues. Their responsibilities fall into three areas:

- The planning and conduct of operations and the command of assigned force elements within a joint or multinational maritime task force, either as part of the Maritime Component Command or as an embarked CJTF.
- The promotion of the operational effectiveness of the task group and supporting force elements through measures to develop and maintain appropriate levels of expertise and preparedness for task group operations in the maritime domain.
- The provision of mentoring and advice to personnel within a task group.

Unit Command

The Chief of Navy personally appoints the commanding officer of each ship and force element. The key command responsibilities of preparedness and personnel resource management are common to both forms of command and are a significant part of the RAN's command and control.

Sea Command

Sea command is the authority to exercise command of ships and submarines and involves the responsibility for their safe conduct. Officers assuming sea command must be competent commanders in the broadest possible sense before taking up their appointments.

The impact of technology has increased the complexity of operating in the maritime domain. Many of the leadership and personnel management challenges of sea command have been reinforced by the introduction of legal penalties for breaches of requirements in areas such as workplace health and safety, environmental protection, and equity and diversity. Notwithstanding these changes, the essential nature of command at sea has not changed; it is still primarily tactical in nature and the affect of most decisions will be felt in the short term. The position of the commanding officer at the pinnacle of a small hierarchy is unchanged and immediate obedience to a command decision is necessary and expected.

Air Squadron, Flight and Aircraft Command

Air squadron command is the authority to exercise command of naval air squadrons and is vested in officers borne in squadrons for flying duties. Squadron commanding officers are responsible for the command, discipline, organisation, administration, safety and welfare of their squadrons and their people. More specifically, squadron commanding officers are responsible to the Fleet Commander for the conduct of flying operations and to the Commander Fleet Air Arm (COMFAA) for maintaining the operational airworthiness of their squadrons and for the provision and maintenance of a flight management system.

Flight commanders of embarked flights are responsible to the ships' commanding officer for all matters relating to their flights. They are responsive to COMFAA for the output of their flights and are to keep COMFAA fully informed of all matters relating to their flights that may come to the attention of Fleet Commander.

The command of naval aircraft may only be assumed by officers suitably qualified to do so.

Command Ashore

The Chief of Navy exercises administrative authority of Navy people ashore through the chain of command and establishment commanding officers are delegated to discharge this authority. Where members are placed outside the normal naval chain of command (such as for duties with other service or joint units) the normal policy is to post these members to the nearest or most appropriate naval establishment, but for duties with the specific unit where they serve. The establishment commanding officer retains the administrative delegations for these personnel and, therefore, is primarily concerned with their command.

Shore establishments exist primarily to develop, manage, maintain and sustain people, infrastructure and support services necessary to project and support operational capability through the subordinate and lodger units located within them. They are thus an integral and essential part of the support system. Historically, establishment commanding officers were responsible for providing this capability and the resources required were allocated to them. The steady increase in commercialised support and the move to shared support services, under central control, has meant that the commanding officer's control has lessened. Commanding officers ashore are now responsible for coordinating all cross-establishment administrative, logistics and other services, including safety. This involves coordinating activities between the subordinate and lodger units as well as close engagement with the appropriate enabling and output groups within Defence and a wide range of external organisations.

The shore establishment commanding officer's responsibilities largely focus on business and people management issues, and some of the prerequisite skills and training required to command ashore effectively now differ considerably from those associated with the sea-going environment. Although the leadership and management environments are very different, whether at sea or ashore, many of the fundamental command obligations remain unchanged.

THE FUTURE COMMAND ENVIRONMENT

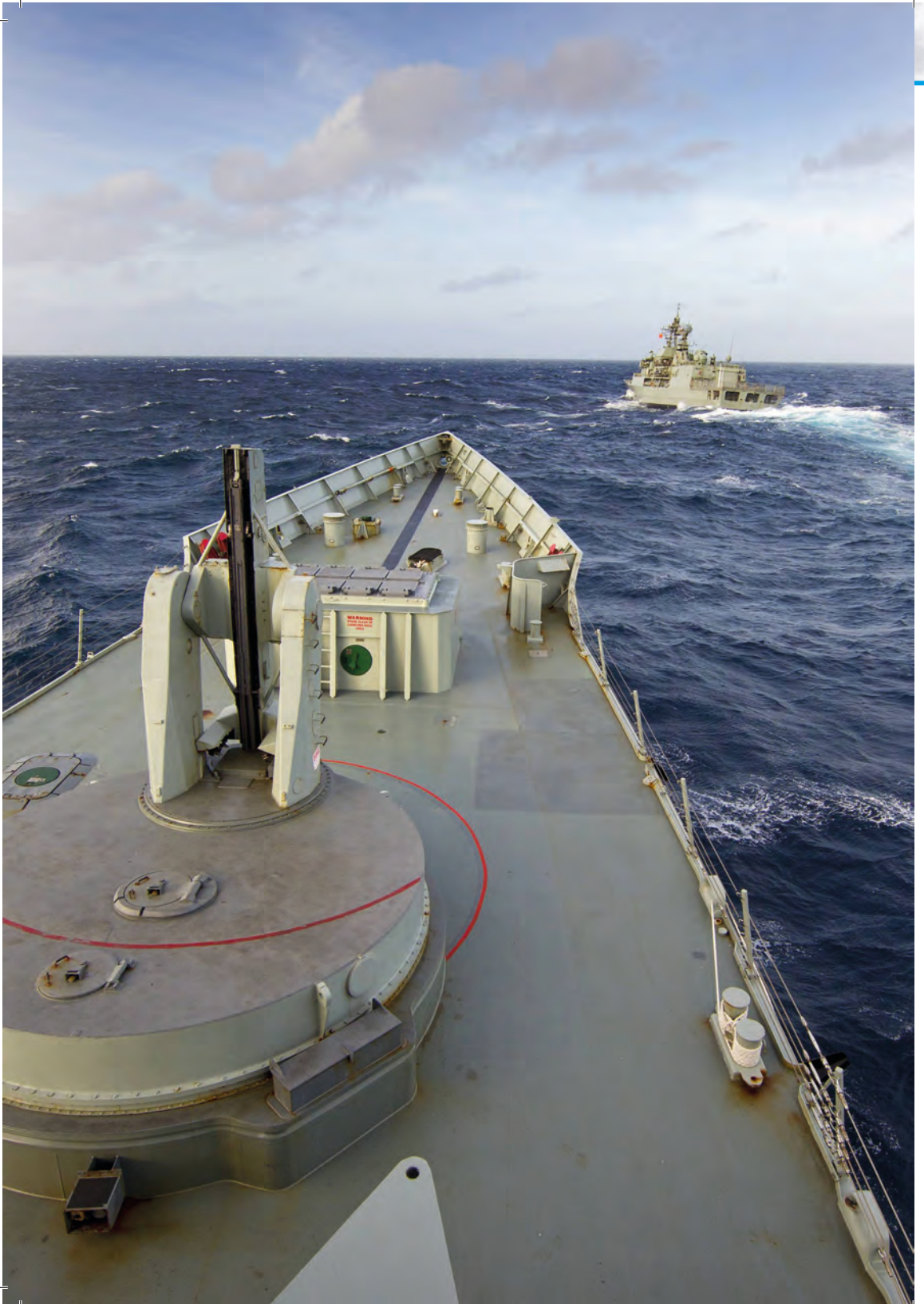
Continuing advances in information technology can allow for a greater distinction between the concepts of command and control, with command functions being centralised, but control functions being distributed to the lowest reasonable level. Command is, and always will remain, a human function. Hence, although technology can be expected to change the way in which command is exercised, the fundamentals will remain constant.

The concept of mission command has been adopted by the ADF. This is not new to navies, because of the past limitations of timely communications technology. Mission command emphasises de-centralised command, freedom and speed of action and initiative, while remaining responsive to higher direction. It relies on tactical commanders understanding the strategic and operational contexts of their actions within the joint operational framework, to enable quick and appropriate reactions to demanding situations. De-centralised control of operations will remain the key to ensuring the RAN remains a resourceful, innovative, flexible and adaptable component of the joint force.

The same technology that provides commanders with real-time information on their subordinates' activities has already blurred the traditional boundaries between strategic, operational and tactical actions. Consequently, there may well be justification for commanders to intervene at the tactical level where, because of access to superior information, it becomes apparent that an adverse strategic outcome may result without their intervention. Commanders at all levels must be mindful of this and accept the reality of intervention from above, but equally ensure that such intervention is not unnecessarily imposed on their subordinates.

Another important consideration in future command and control arrangements is information management. Technology provides the means of transferring large quantities of information, but more information does not necessarily lead to better understanding. In fact, information overload is a possibility and management procedures must ensure that only necessary information is passed around the network. This will be the greatest challenge in evolving future command and control arrangements.

Nevertheless, commanders must remain mindful that timely decisions need to be made, and that neither information overload nor a lack of information must be allowed to stifle initiative. This requires the acceptance of a greater level of risk, but a timely average decision invariably beats the perfect decision made too late.



4. SEAWORTHINESS FOR MARITIME OPERATIONS

- The Chief of Navy is the Authority for Defence Seaworthiness appointed by the CDF and Secretary of the Department of Defence. They head the Defence Seaworthiness Management System.
- Seaworthiness is managed to maximise the achievement of specified operational tasking as well as eliminate, or minimise so far as practicable, the hazards and risks to personnel, the general public and the environment.
- The Capability Manager's Operating Intent is the central, unifying concept for the management of seaworthiness. A Statement of Operating Intent is required prior to the entry of a maritime mission system into service, and it will continue to evolve throughout the in-service phase of the capability system life cycle.

The CDF and Secretary have appointed the Chief of Navy as the Defence Seaworthiness Authority to head the Defence Seaworthiness Management System (DSwMS), the governance of which is detailed in the Defence Seaworthiness Management System Manual. The DSwMS is applicable to all:

- Defence activities in the maritime domain
- support activities associated with Defence activities in the maritime domain
- Defence maritime capability, both existing and new, throughout the capability system life cycle.

The DSwMS was created in 2009 to aid risk assurance and contribute to risk control for Defence's maritime mission systems. The initial focus was on personnel safety management accountabilities but this was later expanded to include operational effectiveness and environmental protection compliance. It now addresses all maritime mission systems (regardless of Service) and the enabling support systems, at all stages of the capability system life cycle, in delivering the seaworthiness outcomes.

All ADF elements that undertake or support activities in the maritime domain must articulate their means of compliance with the requirements of DSwMS and undertake internal assurance activities to confirm that compliance.

The DSwMS is intended to:

- a. provide capability managers with:
 - (i) confidence in the ability of each of their maritime mission systems, enabled by its support system, to deliver the operating intent they have defined.
 - (ii) assurance that hazards and risks to safety of personnel and the environment have been eliminated so far as is reasonably practical.
- b. facilitate the identification and management of strategic and systemic hazards and risks to the achievement of the seaworthiness outcomes.

Scope

Seaworthiness is defined as, 'A judgment of mission system(s) to be supported in becoming and thence remaining seaworthy utilising the services of the support system'. A maritime mission system is seaworthy if its operation is in accordance with its Statement of Operating Intent (SOI) and:

- maximises the likelihood of achieving the specified operational effect for the defined tasking
- where efforts have been made to eliminate and/or minimise hazards and risks to personnel, the general public, and the environment so far as is reasonably practicable.

These definitions reflect the principal focus of the DSwMS, which are all maritime mission systems and the support systems enabling them. It should be noted, however, that by its very nature DSwMS will evolve, and may well expand to include non-operational maritime activities where assessments of risk determine that such expansion may be prudent. Similarly, in the longer term, there may be potential to expand DSwMS principles to provide improved assurance of the collective 'worthiness' of multiple maritime mission systems, such as task groups.

Capability Manager's Operating Intent

The capability manager's operating intent, in conjunction with the mission system supportability statement (MSSS), provides the central, unifying concept for the management of seaworthiness. It sets the context for the management of hazards and risks to the achievement of seaworthiness outcomes for a particular maritime mission system, and thus provides the basis for the management of its seaworthiness. The capability manager's operating intent for a particular maritime mission system must be subject to a timely and structured process of evolution and enhancement throughout the life of the maritime mission system. It must be readily available to those involved in the development, acquisition, operation, upkeep and disposal of the mission system and its enabling support system as a central reference for decisions regarding the management of seaworthiness.

Defence Seaworthiness Management System Design Intent

Central to the design of the DSwMS is that it is an outcome-focused system. In general, each force element will have latitude to apply the means of compliance that best meet particular circumstances, so long as the outcome sought by the DSwMS is achieved. Directed means of compliance will be imposed only where explicitly required by legislation or where justified by identified hazards and/or risks to the achievement of the seaworthiness outcomes.

Many practices throughout Defence and industry that pre-date the formalisation of seaworthiness concepts remain inherently relevant to its management. The DSwMS does not seek to replace these practices; rather, it seeks to identify and enhance the appreciation of the inter-relationships and interdependencies between those practices in order to facilitate continual improvement and enhanced alignment. Essentially, therefore, the DSwMS is a 'system of systems'; developing new elements and assurance activities only where necessary.

Implications for Maritime Operations

The through-life nature of the capability manager's operating intent for a particular maritime mission system provides both operators and support agencies with a clear and current articulation of the requirement. This facilitates the delivery into service of a mission system that is fit for its intended purpose and enabled by a comprehensive support system.

The capability manager's operating intent should evolve into a SOI prior to entry of the maritime mission system into service. The SOI describes the approved roles, operating envelope, usage spectrum and operating environment for a particular mission system or class of mission system. In conjunction with the MSSS it describes the mission system's physical characteristics, peacetime capability, limitations, usage, support, upkeep cycle and mission profiles. It is a description of the system's intended roles and functions and provides guidance on how to manage platforms, and how commanding officers and other authorities operate and maintain their units in accordance with design intent.

The SOI should evolve throughout the in-service phase of the capability system life cycle, so it continues to reflect the capability manager's current operating intent. Changes to the SOI require prompt and effective communication to, and negotiation with, all operators and support agencies. This ensures that optimal delivery of seaworthiness outcomes is maintained throughout the in-service phase.

The existence of the SOI does not preclude the use of a maritime mission system in a manner falling outside the SOI's terms. Any decision to do so must, however be supported by a rigorous consideration of the hazards and risks that this entails.



5. MARITIME PREPAREDNESS

- Readiness describes the capacity of a force element to be committed to operations within a specified time, and to achieve the desired operational outcome.
- The period permitted for a unit to complete its work-up from the directed / minimum level of capability for a specific operational task is called 'readiness notice'.
- The RAN employs its operational capability within a preparedness continuum comprising preparation, work-up, operations and reconstitution phases.

Australia's operational maritime capability is generated from the complex mix of the RAN's force structure, working with the other Services and groups as well as other government departments. Within Defence, the Navy's preparedness is the sustainable capacity of Navy to deliver a trained force to accomplish directed and emerging tasks. The range of tasks that Navy may perform is called the Defence Preparedness Requirements and these vary from direct military action to constabulary and diplomatic activities. Preparedness has two components which are:

- Readiness; the ability to commit to operations in a specified time
- Sustainability; the ability of a force element to maintain the necessary level of combat power for the duration required to achieve its objectives.

Military capability comprises several inputs, which Defence has categorised as fundamental inputs to capability (FIC). The extent to which these individual inputs may contribute to specific capability can be measured and will provide an indication of the resource implication of that capability. They are:

- **Organisation.** Every element of the Navy must be established so that it can provide the optimum level of support. This includes having the requisite skill sets, in the numbers needed, to meet its responsibilities including those of command and control.
- **Command and management.** This includes the responsibilities, defined command and control mechanisms, doctrine, processes and procedures to enhance military effectiveness.
- **Personnel.** The effective conduct of operations demands the provision of enough people who are properly trained, competent, resilient and fit for duty.

- **Collective Training.** All Navy operational force elements must conduct a comprehensive and ongoing regime of collective or team training so that they meet prescribed preparedness levels.
- **Major systems.** These include ships, aircraft and other major weapons systems that are the core elements of capability.
- **Facilities and training areas.** This includes owned and leased Defence buildings, structures, property, plant and equipment, areas for training and other utilities needed for training and support, both in home ports and at deployed locations.
- **Supplies.** Supplies must be available for force elements to enable them to reach training and preparedness objectives up to the operational level of capability (OLOC). These Supplies must be available within the required readiness notice; the period within which force elements must achieve OLOC. They must be sufficient to enable force elements, to deploy on operations independently pending the establishment of a resupply system.
- **Support.** This encompasses the infrastructure and services within the national support base (within Australia) and overseas which are integral to the maintenance of Defence effort. This includes infrastructure, maintenance, logistics engineering, training, the latest configured data and support from contractors and other government agencies and non-governmental organisations.
- **Industry.** This comprises the industrial capabilities and the capacity of Australian business to deliver Defence capability including operational capabilities and the full spectrum of support functions.

Defence preparedness is managed against the three levels of operational capability used by the ADF:

- **Baseline Level of Capability (BLOC).** This is the level of capability required to be maintained by all force elements to allow them to reach the Minimum Level of Capability (MLOC) within a specified warning time. It is a consideration of the degree of skill required to be practiced (competency) and how often (currency) and is commensurate with operational requirements and resource limitations.
- **Minimum Level of Capability (MLOC).** This is the lowest level of capability from which a force element can achieve OLOC within a designated Readiness Notice. MLOC encompasses the maintenance of core skills, safety and professional standards. MLOC may be equal to but never less than BLOC.

- **Operational Level of Capability (OLOC).** This is the role specific level of capability at which a force element needs to be certified so it can conduct missions at an acceptable level of risk. For Navy OLOC is set and maintained by the Chief of Navy in consultation with HQJOC. As OLOC is role-specific it does not necessarily reflect the full capacity of the force element; which may have a capability above OLOC. Achieving OLOC is resource intensive and only force elements requiring this level of capability are prepared or maintained at OLOC. Maintaining OLOC for a prolonged period includes the capacity to rest personnel, maintain major systems and sustain supply levels as well as simultaneously maintaining training levels for the other roles the force element is to perform.

PREPAREDNESS OF MARITIME FORCES

Readiness

Readiness denotes a force elements ability to be committed to operations within a specified time; known as readiness notice. Readiness refers to the availability and efficiency, availability and serviceability of personnel, equipment, facilities and consumables allocated to a force element. It is a combination of the materiel and personnel state as well as the currency of collective training, but it does not mean that the force element is able to accomplish all of its assigned roles; only those required of it for the assigned tasks.

Readiness is also a factor in the kinds of operations likely to be undertaken and affects the overall capacity of a ship or other force element. A focus on training for anticipated humanitarian operations may well result in a degradation of core war-fighting skills, with consequences for the employability of force elements and with a subsequent resource allocation in the event of changes to anticipated tasking. In practice, force elements are generally kept at BLOC/MLOC and achieve higher levels of preparedness, especially complex war-fighting skills, only when necessary in preparation for specific operations.

It is recognised that war-fighting involves a mix of skills that require specific training in preparation for joint and multi-national task group operations. Annual training programs focus on meeting these requirements. The Fleet Commander is responsible to Chief of Navy for generating and preparing naval forces for operations, assigned tasks and contingencies.

There are several measures of time that are important aspects of readiness. First, crisis-warning time denotes the period where an emerging issue is likely to require a response. It varies with the nature and intensity of the threat and encompasses all of the analysis, planning and preparation associated with the lead up to operations. Its variability will result in some capabilities being kept at short notice readiness.

The period permitted for a ship, or other force element, to complete its work-up from a lower level to the required level of capability for a specific operational task is called 'readiness notice'. The ongoing preparedness of maritime forces must be managed to ensure that the ship, or force element, can be prepared for the task within the required time frame. Readiness notices can sometimes be a matter of hours in short warning situations. Units being kept at high levels of readiness may need to be rotated, at frequent intervals, to allow for crew respite and to provide opportunities for skills retention training and development.

'Notice to move' is the time from when a force element receives direction to move to conduct a specified operation or mission, to the time it either actually moves or is required to be able to move to conduct that operation or mission. Mission briefing is normally conducted during this period, which is usually expressed in hours or minutes. Force elements that are permanently sustained at a mission ready status may be given a notice to move rather than a readiness notice for very short-notice tasks. For the RAN this could include elements of clearance diving teams, responsible for explosive ordnance demolition, and operational response vessels designated at specific times.

Because changes to readiness levels have resource implications, these must be resolved before any decisions to change readiness levels are made.

Sustainability

Sustainability is required throughout all phases of an operation. It is the ability of a ship, or other force element, to continue to be able to conduct directed tasks, and is measured against personnel, supplies, facilities and the necessary support. The nature and duration of an operation dictate the sustainability requirement. Sustainment planning is based on an estimation of operational tempo and forecast materiel usage rates, and is influenced by competing priorities of both concurrent and forecast operations and activities. In reality, sustainability and the consequent demands on support systems are often difficult to predict.

Concurrency

There are two dimensions to concurrency. The first concerns competing demand for resources. The second concerns competing demands on force elements to meet simultaneous requirements. One or both of these dimensions will usually require the establishment of priorities. Operational planning must take account of the number of concurrent activities able to be undertaken by each force element. Predicting potential occurrences of concurrency is inherently difficult and may require the readiness levels of uncommitted force elements to be adjusted.

Mobilisation

Mobilisation is the process of moving from the prepared state for a range of contingencies to being ready to conduct a specific mission. It embodies Government commitment to respond to emerging contingencies and can encompass greater capability and a more comprehensive national support base than is normally available to Defence. Deliberate mobilisation planning is part of preparedness management, while the act of mobilising is part of a specific operation.

Preparedness Management System

The Australian Government's strategic policy defines requirements for the defence of Australia and its national interests; and provides the basis for the conduct of strategic appreciations and development of operational plans. Defence requirements are managed within the preparedness management system; designed to ensure the effective response by Defence to Government requirements. It is a system of systems that allows for the simultaneous management of demands on finite resources. As such, it is a critical element in a broad Defence decision support system that assists the senior leadership in balancing competing preparedness demands, while still delivering outputs with finite resources.

The preparedness management system provides the basis for the allocation of resources to the RAN. The key planning documents that drive preparedness include:

- Defence planning guidance that links Government strategic guidance and requirements with strategic risks
- the CDF Preparedness Directive (CPD). This is the principal strategic-level directive that contains strategic-planning guidance and lists Defence Response Options and Strategic Defence Objectives that determine preparedness requirements. It informs all subordinate preparedness and capability directives at the operational level, which set specified levels of training and resourcing. It also contains the capability standards against which force units measure and report.
- the CN Preparedness Directive that is the principal single-Service directive.

PREPAREDNESS IN EACH PHASE OF MARITIME OPERATIONS

The preparedness of individuals, ships and other force elements is an integral and fundamental consideration for each phase of a maritime operation. Preparedness is in practice a continuum, as at any given time, depending on the operational tempo and the required level of maritime capability, different force elements will be at different levels of preparedness and preparedness phases. The RAN routinely faces the challenge of consecutive and concurrent activities in multiple theatres. Many of these are long-term commitments and each requires a distinct set of maritime capabilities.

Throughout these phases, force commanders, on behalf of the Fleet Commander, are responsible for generating and managing the capability of each platform from its entry into service until withdrawn from service and transferred to the Capability Acquisition and Sustainment Group (CASG) for disposal. This is both a command and a management function. Commanding officers of ships, and other force elements, are responsible for preparing their force element to meet CPD and CN Preparedness Directives as well as its safe operation and the safety of all involved personnel.

Preparedness Complexity

The demands placed on the RAN in the early-21st century provide a good illustration of the complexity that can arise when managing the preparedness of maritime capability. In any one year the RAN would routinely be conducting concurrent diverse operations in multiple and often widely separated areas. These operations might include; providing assistance to the civil administration in the Solomon Islands, participating in the post-war rehabilitation of Iraq, while simultaneously fulfilling ongoing commitments to border protection, fisheries patrol and hydrographic survey in both Australian and regional waters. Each force element employed on these operations/activities was at a different phase of preparedness and required distinct types of maritime capabilities.

Preparation Phase

The RAN is always conducting training to meet operational contingencies. Consequently the preparation phase equates to the RAN's routine activities and force elements will normally be at an agreed and sustainable preparedness level. During the preparation phase, the Fleet Commander ensures that the Fleet has the capabilities stipulated in the CPD. For a particular contingency the Fleet Commander must ensure that force generation requirements are shaped by Government's policy objectives and strategic concepts. This includes:

- an understanding of the military conditions for success and the required end-state
- an assessment of the threat

- the forces available and their readiness
- the time available to respond
- the likely duration of the operation/activity.

To ensure each force element is appropriately prepared for its intended employment, the Fleet Commander expects each force commander, and commanding officers, to develop plans that meet known operational, preparedness, exercise and international engagement requirements. The force commander then coordinates the inputs, including those of the various service providers and suppliers, that collectively enable the force elements to meet the Fleet Commander's requirements.

In carrying out this role the force commander develops a framework of cooperative relationships with suppliers and providers (i.e. service level agreements and mutual support arrangements). The Chief of Staff at Fleet Command performs a vital role during the preparation phase by coordinating activity among component forces and providing specialist logistic, personnel and engineering advice and support to force staffs, ships and other force elements.

During this phase the focus is upon repair and maintenance, inventory management, as well as individual and collective team training. This phase also includes periods of equipment test and evaluation. Commanding officers are responsible for ensuring that their force element successfully completes this activity and also that they have the required number of appropriately trained personnel to meet allocated requirements.

Sea Training Group

The Sea Training Group plays a major role in conducting work ups for ships, submarines and aviation squadrons in preparation for the conduct of future activities and operations. It has four sections (Major Fleet Units, Submarines, Aviation and Minor War Vessels) and exists to help train and assess collective competency in force elements as they work up to the degree of preparedness determined by the CPD.

Sea Release Assurance Framework

The Sea Release Assurance Framework (SRAF) is a multi-layered structure within the Defence Seaworthiness Management System (detailed in Chapter 4) that enables a ship or force element to attain the required level of readiness through standardised iterative processes. Preparation, organisation, training and assessment mechanisms appropriate to SRAF stages inform formal seaworthy evaluations that allow the force element to be 'released' to undertake the required tasking. The SRAF provides consistent and predictable levels of force element readiness while still meeting seaworthiness requirements.

The SRAF is divided into Sea Release Levels (SRLs) that are aligned to the Fleet Operating Continuum. These are numbered and achieved consecutively from SRL1 through to SRL4. Assessments at each level vary, but culminate in a range of outputs, such as deficiencies, reports and defects. Each output is risk assessed individually and collectively, evaluated, and an endorsement determination made. If endorsed, the assessment outputs and a Certificate of Conformance are provided to a Sea Release Board for SRL1-3 and a Battleworthiness Board for SRL4 as objective evidence to support the assurance process.

Sea Release Levels

SRL 1 - Release to Sea to undertake Mariner Skills Evaluation and Sea Trials. This is the initial SRL and releases the ship, or force element, to proceed to sea for training, the mariner skills evaluation (MSE) and sea trials after an extended maintenance activity. All training, assessments and evaluation activities undertaken prior to SRL1 are therefore completed in port. Subsequent activities address individual, collective and organisational proficiency. Assessments and evaluation are undertaken both internally and externally.

SRL 2 - Release to Unit Readiness Workup. This is awarded on the successful completion of the safety workup, MSE, sea trials, and the defect rectification period. These activities are undertaken alongside, at anchor/buoy and at sea. The safety workup and MSE is a collective activity and is aimed at providing a ship, or force element, with the basic mariner competencies required for safe passage at sea by day and night as well as those functions all ships are required to perform such as search and rescue (SOLAS compliance) and Defence Assistance to the Civil Community. SRL2 releases a fleet unit for unit readiness workup and unit readiness evaluation (URE).

SRL 3 - Release to Naval Activity Schedule or Mission Readiness Workup. This is awarded on successful completion of the URE. The unit readiness workup and URE ensures a ship, or force element, is capable of undertaking the range of normal peacetime evolutions with the unit's statement of operating intent. SRL3 releases a fleet unit to undertake tasking in the Naval Activity Schedule or continue in the SRAF to undertake the mission readiness workup and mission readiness evaluation (MRE).

SRL 4 - Release to Mission. This is awarded on the successful completion of the MRE. SRL4 is not mandatory and the requirement is determined by the necessity to have specific mission readiness competencies related to specified operational commitments (i.e. achieving OLOC). Consequently, the workup will be mission specific and may need to; include support from other service elements (i.e. RAAF aircraft or army special forces); require the force element to be incorporated into a task group or have access to suitable simulation assets. SRL4 releases a ship, a force element or a task group to undertake a specified activity or operational tasking and provides readiness and seaworthiness assurance to the intended operational authority - typically CJOPS. This is the level at which COMWAR would declare the ship, force element or task group battleworthy to proceed on deployment or to be force assigned for operations.

Battleworthy

A ship, or force element, is assessed as battleworthy if it is seaworthy and has achieved the designated mission specific competencies; as detailed above. Its missions systems must be able to operate at optimal performance and it must be provisioned with supplies to support the mission over a specified operational viability period (OVP). The OVP for force elements varies from ship to ship and is explained more fully in Chapter 6. Additionally the ship, or force element, must be provided with the required mission specific data, information and direction to achieve its mission. Finally, the unit must be effectively organised, managed and well led to undertake the specified mission.

The introduction of on board training systems to RAN warships enables realistic warfare training to be conducted alongside or underway, whether as a single ship or as part of a task group. The use and increasing reliance on simulation and emulation also allows realistic mission rehearsal to be conducted before an operation. On board training systems similarly assist in maintaining war fighting skills while deployed on non-warlike operations and in skills regeneration during reconstitution periods.

Preparing for Operation SLIPPER, 2005

The frigate HMAS *Parramatta* followed a structured work-up progression in 2005. Following a period of reduced availability for routine maintenance, the ship completed a mariner skills evaluation to ensure it was safe to conduct activities within Australian waters. The ship then undertook a unit readiness work-up, followed by a mission readiness work-up to prepare it for deployment to the Middle East for operations in the Arabian Gulf with coalition forces. Each stage of this progression built upon the capability attained during the previous stage. *Parramatta's* level of preparedness resulted in the ship being assigned the duty of Khawr al Amaya Oil Terminal Scene of Action Commander within two hours of the ship arriving in the patrol area.

Operations Phase

The operations phase is effectively the conduct of operations or assigned tasks in accordance with promulgated orders such as an operation order, mounting instructions or an exercise directive. Force elements will normally be force assigned to CJOPs for operations. Deployment to a theatre of operations involves embarking, sailing from home bases, passage to the area of operations and finally arrival in the area of operations in a posture appropriate to the threat and mission. DGMAROPs, in HQJOC, and the Chief of Staff in Fleet Command provide and coordinate support to ships, or force elements, throughout the operations phase.

Reconstitution Phase

Reconstitution is the process by which, at the conclusion of the operations phase, individuals, ships or other force elements reassume or return to the required BLOC preparedness levels. The reconstitution phase begins with the redeployment of forces from the area of operations and concludes when the forces are returned to the preparation phase. Reconstitution is not aimed at rectifying any enduring deficiencies, such as shortages of specialist personnel. Reconstitution focuses upon respite for personnel, recovery of a unit's materiel condition and the rebuilding of skills levels.

Recent experience, of prolonged and high-tempo maritime operations, has reinforced the importance of the reconstitution phase. Reconstitution is thus an entrenched part of the operational planning process and is acknowledged as a whole-of-navy activity. As such, reconstitution activities may require reduced participation in exercise activities, international engagement opportunities and also a reduced level of preparedness for short notice operations.

Nevertheless, a unit's opportunity to reconstitute will still be determined by operational priorities. The RAN has limited discretion in this regard and must be prepared to fully utilise periods of reduced operational tempo to conduct reconstitution activities. The appropriate balance between extant commitments and reconstitution objectives will be determined by Chief of Navy and will be reflected in unit scheduling within the Fleet Activity Schedule (FAS).

Reconstitution must be undertaken in a clear and focused manner, guided by a strategic-level plan that addresses any capabilities that have been eroded by high-tempo operational employment (i.e. high end war fighting skills if a force element has been employed on constabulary duties). Fleet Command, and force commanders, should articulate a clear reconstitution end-state and resources must be assigned to achieve the identified objectives. Based on the priorities agreed in the strategic-level reconstitution plan, each commanding officer must also ensure that reconstitution objectives are achieved. Issues to be considered in a reconstitution plan include:

- personnel management, particularly leave, career development and individual prerequisite training
- maintenance, repair and materiel condition, including auditing of major systems
- collective training in certain war fighting skills (such as anti submarine warfare) that may have degraded during recent operational employment
- inventory replenishment
- team building and reinvigoration activities such as sport and adventure training.

Reconstituting the RAN

The Chief of Navy is responsible for ensuring that the RAN can meet its operational commitments. This will involve providing ships and other force elements appropriately prepared for ongoing operations as well as satisfying the preparedness obligations associated with emerging contingencies. In addition there is a continuing need to maintain core war fighting skills, appropriate materiel states and professional standards; not only just in times of high operational tempo. Close attention must be paid to meeting the needs of the Navy's people and this includes the provision of training and development opportunities, adequate respite, a safe working environment and personal and family support.

All of these activities are part of the reconstitution process, which seeks to ensure that operational demands are met, but not at the expense of the long term well-being of the Navy's people. This can be difficult at times and requires sound planning and good leadership if it is to succeed.

PREPAREDNESS ISSUES FOR THE FUTURE

The Navy has traditionally utilised a 'can-do' approach to operational activities; with the emphasis very much on getting the job done, often to the exclusion of other issues. Such an attitude is critical to success in combat but needs to be qualified, especially in non-warlike operations. In these, the emphasis needs to be primarily on getting the job done safely. In combat the operational requirements will always prevail.

Consequently, such activities as the reconstitution phase of the preparedness cycle need careful planning and consideration, so that both people and equipment receive the necessary respite. At all levels of command and leadership the ability to undertake tasks safely, adhere to equipment maintenance schedules and undertake required training activities will be a major task. Adherence to extant policies will not always come easily and very sound judgment will be needed to ensure that compliance is a matter of course and only rescinded in exceptional circumstances.



6. SUPPORT FOR MARITIME OPERATIONS

- Support remains a fundamental and critical part of the conduct of maritime operations and must be planned for accordingly.
- Although warships deploy with lengthy operational viability periods, they do require the routine resupply of fuel, lubricants, explosive ordnance, provisions, equipment repair parts and other stores.
- Deployed force elements may be resupplied from an afloat support force or from a logistics support element ashore.

For operational tasks to be accomplished successfully, a range of support functions must be in place. These exist both within and beyond the Navy and are either wholly or partly dedicated to meeting the Navy's needs. Support to maritime operations always includes a significant portion of logistics and the latest policy and procedural documents concerning the ADF's approach should be read in conjunction with this chapter.

There are five main facets of support for maritime operations:

- **Operating Support.** This includes all support functions (particularly personnel, administrative and health support) dedicated to specific operations.
- **Engineering Support.** For the Navy's maintenance effort to provide ships, and other force elements, at assured levels of readiness it must be carried out within a regulated framework. The Naval Technical Regulatory System is designed to provide this framework by using a risk-based approach to maintain the technical integrity of all equipment.
- **Supply Support.** This ensures the timely provision of items such as fuel, lubricants, ammunition, food, medical stores and equipment repair parts to force elements, whether operating in Australian waters or deployed overseas.
- **Maintenance Support.** For RAN ships, aircraft and other force elements to be able to respond to operational demands they, their equipment and other systems, must be kept at pre-determined levels of readiness. This involves a combination of planned maintenance and the ability to respond to defects as they arise.
- **Training Support.** The Navy's training system provides suitably qualified and experienced personnel to form integrated ships' companies for the Fleet and for supporting tasks ashore.

MARITIME LOGISTIC SUPPORT CONSIDERATIONS

Design and Maintenance Factors

Many constraints on logistic support are set long before any unit is deployed on operations. For example, a warship's operating and logistic support concepts are defined in response to the defined capability need. Ships possess a predetermined storage capacity as well as weight, volume and stability constraints. If a ship is an 'off-the shelf-design', alteration of the logistic support concept can be difficult and/or expensive to undertake. A ship's physical attributes, in concert with both legislative (e.g. safety, environmental protection, explosives transport and stowage) and operational (e.g. fuel consumption, ordnance expenditure, embarked personnel) constraints, determine the length of time it can operate independently without replenishment. This is commonly known as endurance, or operational viability period, which is the period of time that a ship, or other force element, can operate without resupply. Replenishment at sea allows a ship to re-set its endurance levels for items such as food, fuel and certain stores such that ships can continue to operate for very lengthy periods.

Replenishment at sea capabilities are a major consideration in warship design. Relevant factors include internal replenishment routes, liquid transfer and management systems, materiel handling equipment, availability of crew for manual handling and the ability to operate weapons and sensors during replenishment. Compatibility with the replenishment systems of allies and potential multi-national partners is also an important force multiplier. Failure to give these factors adequate consideration may result in a ship requiring time away from its tasking to replenish.

Warships are maintained according to a usage and upkeep plan, developed during the requirements phase of the capability system life cycle. This is to ensure that a ship and its systems are regularly maintained, ensuring maximum availability for operations between scheduled maintenance activities. A ship cannot be ready for deployment, or sustained for a specific mission, without the preventative and corrective maintenance support activities performed throughout its life. Preventative maintenance is arranged so that maintenance that cannot be done while the vessel is in use can be grouped to be conducted in a designated upkeep (maintenance) period. Typically, deep-level maintenance support is drawn from Australia, sourced by the Capability Acquisition and Sustainment Group (CASG) from domestic industry, international agreements and strategic contracts.

Warships will also carry a specified quantity of equipment repair parts to conduct planned maintenance or to support the repair of critical systems onboard, but due to space and weight can not carry all equipment repair parts that may be required for a system onboard. When required equipment repair parts will need to be expeditiously dispatched to the ship to undertake the necessary repairs.

Domestic and International Factors

Domestic and international economic policy, industry capacity and the prevailing political climate are all factors that determine how an operation or activity will be supported.

Ships regularly deploy away from their home port, regardless of whether they are conducting routine peacetime activities or undertaking combat operations. There is a cost premium associated with conducting support activities, particularly in remote ports that do not have the range of local infrastructure required to fully support a warship. In Australian ports, especially those with heavy merchant shipping traffic, securing berthing space and port services may also be difficult, costly and subject to short-notice change.

More often than not commercial imperatives, such as those associated with just-in-time delivery will ensure that merchant ships receive priority for berthing and other support services in commercial ports. For example, obtaining a berth in a commercial port at short notice, especially outside Australia, is difficult because merchant shipping generates income for the port authority, supports international trade and this contributes to a country's economy. A warship occupying a commercial shipping berth brings none of these benefits and can interrupt trade activities.

Conversely, a warship, with its much larger crew, needs larger volumes of food, amenities and other supplies, which may either benefit the local economy or, in some cases, be beyond the capacity of local providers. Repair of equipment to the appropriate standard may be obtained overseas, but this can also be at a cost premium, as the cost of goods and services will be affected by supply and demand as well as foreign exchange rates.

In addition to physical and environmental factors, in a conflict or where piracy, sea robbery or terrorism are threats, force protection is a key consideration to logistic support. Assets, vital supplies and civilian contractors must be protected and this requirement, together with the need for alternative plans will feature prominently in logistics planning.

Environmental Factors

Sea state, tidal patterns, geography, wind and weather all affect a ship's employment. So too can a ship's design relating to environmental protection (i.e. sewage disposal), as some commercial ports may be reluctant to accept the perceived risks. These factors make logistic support to an operation challenging, so sound planning, including contingency planning, is essential. For example, as it is unsafe to conduct replenishment at sea in extreme weather, warships need to retain a reserve capacity of fuel, stores, ammunition and food to enable operations to continue until the evolution can be rescheduled or moved to another location with more suitable weather conditions.

Extreme weather conditions and seasonal weather changes can interfere with in-theatre supply by smaller vessels. Any consequent delays can have a significant affect on operations ashore.

Operation TANAGER, Timor Leste, 2000

During Operation TANAGER in Timor Leste, in mid-2000, extreme weather conditions made the only road from the main port of Dili (on the north coast) to Suai on the south coast impassable and rough weather conditions off the southern coast made resupply by sea using heavy landing craft extremely dangerous. A civilian landing craft attempting to beach at Suai, to unload stores, broached in heavy weather and was badly damaged. Repeated attempts by a RAN heavy landing craft to safely beach were aborted due to high seas and strong currents. For several weeks the only way to resupply UN forces in Suai was by air. Delays were experienced because certain supplies such as bulk fuel ran low as the only way to resupply this was by using helicopters with an under-slung load.

NAVY OPERATIONAL LOGISTIC SUPPORT CONCEPTS

Self-Sufficiency. Warships, whether operating individually or within a task group, are required to be logistically self-sufficient for the initial periods of a deployment. In addition, ships may have to operate independently of continuous supply chains and often without continuous communication links with external supply support infrastructure. The operational viability period (often linked to sustainability and endurance) of warships varies with the type of vessel and the ability to undertake replenishment at sea.

Unlike land based force elements ships do not always require the establishment of new support mechanisms to operate in remote areas. Use of extant support contracts and mutual logistics support agreements with allies, established port facilities, commercial air cargo routes, and resupply by RAN or multi-national force vessels can extend the endurance of force elements. This can negate the need to introduce dedicated support mechanisms (i.e. sustainment flights, forward operating bases, establishment of new commercial support contracts, etc). There will, however, always be the need to consider dedicated support mechanisms when operating in new or remote regions or where support from allies and multi-national partners is limited.

The amount of support capability on board, together with factors such as consumption rates and resupply availability, determine a vessel's endurance. RAN ships range in size from minor war vessels to major fleet units, but all need the same range of support services to function effectively: food, water, fuel, sewage and rubbish disposal, personnel support, equipment spare parts and maintenance. Some ships require more external assistance than others. Accordingly, the RAN operates its ships with support concepts tailored to the size and on board logistics capacity of the ship:

- **Major Fleet Units.** These ships are designed to operate independently of a parent base for protracted periods in most navigable areas of the world. They can operate for extended periods at sea by replenishing supplies, including fuel, water, provisions and ammunition whilst underway. Their internal logistic support capacity enables them to react to changes in mission because they have specialist personnel, access to resources and some on board maintenance capability.
- **Submarines.** Submarines have similar operating patterns to major fleet units, but are largely reliant on logistic support from a parent base because of their limited on board stowage capacity. Replenishment at sea is difficult and most logistic resupply occurs in port.
- **Minor War Vessels.** Smaller vessels are designed to operate autonomously for much shorter periods. Their tasking is usually limited in range and duration because of their need for support from their parent unit, although because of their operational environment RAN units may operate at greater distances for longer periods than equivalent units in many other navies. Occasionally they deploy to remote areas, including to foreign ports. Their on board logistic support is limited by the space available for fuel, provisions and repair parts. They may not have dedicated logistics personnel embarked and their support is organised and provided by the staff of the parent unit or logistics support element. Examples of such vessels include patrol boats, landing craft, mine warfare vessels and survey motor launches (SMLs). Diving teams, aviation detachments, deployable hydrographic units and special forces elements are supported in a similar way.
- **Coastal and harbour craft.** These vessels are designed for work in and around ports and therefore rely heavily on shore-based support. They have minimal, if any, self-sufficient logistics capacity.

Replenishment at Sea. The availability of underway replenishment ships and the ability to resupply at sea enables warships to remain on station for prolonged periods or at a greater distance from shore-based support. Replenishment at sea may be called upon routinely or as needed during operations. The flexibility provided by this concept is particularly important when host nation or contractor support may be insufficient or unavailable. This may be due to remoteness of location, conflict and instability or diplomatic considerations. The extent to which the logistics network can support warships during operations will determine their operational effectiveness and sustained reach. Warships will normally operate in task groups for reasons of operational flexibility, mutual support and to increase redundancy and support options for the task unit/group.

Replenishment ships. Replenishment ships are specifically designed to support other ships that have limited self-sustainment capacity. They can carry, and deliver, provisions and general stores, both deliver and receive fuel and relieve other ships of unwanted stores and waste. The limited capacity of the RAN's existing replenishment ships to supply items other than fuel to deployed warships can affect sustained reach. Without alternative sources of logistic support such as allied or coalition replenishment ships, or accessible land-based supply, then interruptions to operations must be expected.

Amphibious ships. Amphibious ships are designed to transport and put ashore land forces by landing craft and/or helicopter. They have an inherent, but limited, capacity to sustain operations ashore. Amphibious ships have a large radius of action, purpose-designed facilities to embark and disembark troops and their equipment, and some capacity to logistically support other warships. They have considerable sea lift capacity to transport most general stores and materiel. The ability of amphibious ships to provide sea basing of logistics support is possible and future usage is being considered.

KEY THEMES AND PRINCIPLES

Planning and Preparedness

Planning is a critical requirement of support for maritime operations. The usage and upkeep plan governs the availability of ships for operations. Planning for operations affects this cycle when calculating quantities of provisions and spare parts. Ships generally sail stored to capacity, for maximum flexibility (i.e. in case they are re-tasked to a different activity at short notice). Nevertheless, there are limits to this generalisation, typically driven by the cost and availability of stores to support specific types of operation. Storing considerations include length of mission, space available, safe storage (such as for fuel and ammunition) and weight and volume of items. Stock rotation and shelf life of perishable stores (provisions, elastomers, medical items, fuel and lubricants) must also be taken into consideration.

Ships carry spare parts for both preventative and corrective maintenance. Mission critical systems also have spare parts on board, if only to repair a random catastrophic failure away from shore support facilities. Spare and replacement parts allowances are continually reviewed and adjusted on the basis of detailed monitoring of item usage, ability to procure, ship configuration, individual systems usage and performance. Such performance measurement is necessary if ships are to maintain the required level of operational availability.

Consequently, the RAN employs logistics information systems in ships and ashore. On board ships, all maintenance and inventory data required to conduct organic maintenance is available in an integrated logistic support system. This system can operate in isolation and interact with shore based logistics information systems to communicate maintenance and supply data. The ability to communicate with the ADF supply system to access spare

parts and maintenance data is central to the effectiveness of ship support, as is visibility of stocks aboard ships in company. Importantly, the RAN's use of the NATO standard codification conventions for parts and systems, enables the sharing of information and the acquisition of parts from countries that use this system, such as the United Kingdom and United States.

HMAS *Vendetta* in Vietnam

From September 1969 to April 1970 the Australian built *Daring* class destroyer HMAS *Vendetta* served in Vietnam during a gap in availability of the American built *Perth* class guided missile destroyers. Possessing six 4.5-inch guns and capable of a theoretical maximum rate of fire of 60 rounds per minute, *Vendetta* was particularly well suited to the naval gunfire support role. However, the destroyer was less easily supported by the US Navy logistics system and her ammunition, replacement gun barrels and equipment spares had to be pre-positioned in the Philippines (or transported quickly from Australia at high cost). As a result, and despite being no less successful than the *Perth* class at providing fire support, the RAN only completed one *Daring* class deployment to Vietnam, compared to three each for HMA Ships *Hobart* and *Perth* and two for *Brisbane*.

Command and Control

Command and control of supply chain operations within an area of operations will be the responsibility of the Joint Logistics Component Commander if one is appointed, the senior logistics officer in the JTF, or HQJOC. In the event of a solely naval operation a Logistics Support Element (LSE) would be formed to provide support.

Effective command and control relies on a robust communications and information system. For effective logistic and administrative support of operations it will incorporate data collection, automatic identification, automated data and business information systems, decision support tools and applications, and asset visibility mechanisms. This network must be interoperable with external systems, including those of other nations and civilian contractors, and able to share data throughout the logistic support system.

Furthermore, the logistics, personnel and administrative systems must be able to support deployed operations and have inherent redundancy. Deployed naval forces should nevertheless make provision for situations in which functionality is reduced, perhaps due to delivery service interruptions or difficulties in accessing sufficient communications systems bandwidth.

Operations Support

Operations support focuses on particular logistic, personnel and administrative issues, including the support needed to prepare, deploy, sustain and reconstitute a force allocated to a specific operation. It is a fundamental enabler, and planning for operations support must include all phases of the operations support cycle.

Pre-deployment phase. The objective of the pre-deployment phase is to ensure personnel and materiel readiness. It will include acquisition and positioning of supplies, supporting training and workforce needs, such as filling personnel shortfalls, and administrative tasks designed to support the operation. Most importantly, it includes working up force elements to mission readiness prior to deployment. Many operations, such as humanitarian assistance and disaster relief, will be characterised by limited notice and requires maintenance support elements to be kept at baseline levels of preparedness. Maintenance backlogs should be cleared and maintenance planning should consider the:

- threat and any need for chemical, biological, radiological or nuclear defence
- resources to be deployed
- resources required in the area of operations
- capacity and robustness of the logistic distribution system.

Equipment and maintenance personnel may also need to be prepared for movement into the area of operations, with special attention to the skills most likely to be needed and, if time permits, training in battle damage repair. This preparation may also involve short notice modification of equipment for deployment into unfamiliar environments.

Deployment phase. The deployment phase includes strategic deployment to the area of operations, reception, staging, onward movement and integration of forces. It may include the deployment of a LSE, which will engage contractor support in foreign ports if that proves to be necessary. Ships' maintenance personnel must aim to keep equipment availability at the highest sustainable level.

Sustainment phase. The sustainment phase involves conducting and sustaining operations in theatre. It could involve personnel augmentation and rotation of deployed forces and will rely on timely delivery of new or enhanced capability, resupply and maintenance.

Redeployment phase. The needs of the redeployment phase include recovery of forces and their equipment to their home port. It may also involve offshore disposal of equipment, as well as decontamination of equipment returning to home ports to meet Australian bio diversity (i.e. quarantine) standards.

Reconstitution phase. The reconstitution phase includes maintenance activity for the deployed units and recuperation for ships companies and other deployed personnel.

Contracted Support

The RAN's Standing Offer for Naval Port Agency Services (SONPAS) extends to commercial ports within Australia and globally, although currently excluding the current Middle East Area of Operations. It provides a degree of preparedness should the ADF need to conduct operations in or near any part of Australia's area of interest. These arrangements, which can be activated at short notice if necessary, are used routinely to support the spectrum of ADF operations and standard RAN operating patterns. SONPAS contractors enable flexible, responsive support to ships and, if necessary, other Commonwealth agencies.

Logistics Support Elements

A forward-deployed LSE will generally comprise a small group of logistics and technical personnel whose mission is to source and coordinate the delivery of spare parts, provisions and general support to deployed naval force elements. They also act as the interface between ships and shore support infrastructure, facilitating diplomatic clearances, customs and quarantine compliance, medical and transport support as required and contractual arrangements for support. If operating in a multinational area of operations, they also facilitate any host nation or allied mutual support agreements.

Since 1976, the RAN has maintained a permanent LSE in Singapore as part of the Five Power Defence Arrangements and also in the Middle East since 2001. Other LSEs are formed and disbanded as required. For example, the RAN liaison office Commander Pacific Fleet in Hawaii is regularly augmented with additional staff during Exercise RIMPAC.

Logistics Support Elements

The LSE in support of the Middle East Area of Operations was set up in 1990 to support RAN units deployed to the Arabian Gulf for Operation DAMASK (the 1990-91 Gulf War), and it consisted of supply and technical personnel under the command of an RAN Maritime Logistics Officer. It remained in the Middle East until 1994 to support RAN ships deployed to the Gulf and Red Sea enforcing UN economic sanctions on Iraq. The LSE was closed down in 1994 but re-established, as required, throughout 1995-2000 when Australian warships were deployed to the MEAO. The LSE was re-established in 2001 to support RAN warships and units operating in the Arabian Gulf and for combat operations in Iraq in 2003 and thereafter continued support for RAN units operating off the Horn of Africa and adjacent areas.

Allied Support

Although support from other nations cannot always be guaranteed, the ADF has agreements with other nations to provide mutual logistic support, which in some cases include fuelling agreements. The RAN capitalises on the commonality of systems, logistics data and common operating procedures to access this support. The RAN remains interoperable with potential partners by investing in common hardware and exercising procedures such as replenishment at sea and standard tactics with other navies. Common contracts are also negotiated with other nations for supply of provisions, medical supplies and port services. Additionally the RAN can often call upon other nations to provide medical support to personnel in areas where organic/civil medical support might not be available.

Personnel Support

An often neglected factor are the support requirements for the highly trained personnel who operate the RAN's equipment. The need to provide adequate provisions, capable administrative, medical and pay systems, regular mail deliveries and the opportunity for rest and recreation (either aboard or ashore) is a key enabler when on operations.

Force Elements that are well supported by effective logistics and administrative systems will find it easier to maintain both morale and capability. Similarly crucial to capability is the provision of trained and competent personnel in the associated Systems Program Office, headquarters or logistics support agency.

TRAINING SUPPORT FOR OPERATIONS

An effective training system, and through this an appropriately skilled workforce, is fundamental to the Navy's ability to deliver capability. Fleet Command controls the majority of RAN personnel, enabling a single chain of command from initial entry to operational force element with no division between establishments and ships. Commodore Training is responsible for the entire training continuum from initial entry through to unit readiness training. This process encompasses individual training, collective training and all assessments.

The Contribution of Individual Training to Operations

Personnel receive individual training to enable them to fulfill their roles within their selected employment streams and ranks. Individual training is designed to develop three aspects: career, category/primary qualification and position prerequisite. Additionally training must be robust to build a level of individual resilience to enable personnel to undertake their duties in times of stress and difficulty.

All members of the RAN will be involved in training throughout their careers. This includes time in the classroom, where relatively simple delivery methods may be employed, through to high-end training that engages complex simulation, operational equipment and platforms. Overall, Naval training is designed to progressively increase an individual's resilience and competence, thus enabling the RAN to achieve its mission to fight and win at sea.

The increased use and exploitation of training technology, particularly simulation, is vital in allowing the RAN to qualify its work force; this in turn reduces the reliance on operational platforms and equipment. The various authorities responsible to Commodore Training manage and deliver most initial and ongoing career training. The bulk of this training is undertaken ashore with consolidation at sea as required. Training authorities are organised along the functional lines of initial training, leadership and management, maritime warfare, engineering, logistics and health, aviation and submarines.

Training throughput is closely managed to avoid any delays for trainees and all personnel undertaking on-the-job training are provided with individualised training plans. Nevertheless, the provision of individual training in the Fleet must be managed against several competing demands. Specifically, individuals must progress the achievement of competencies in the context of a busy operational environment. The Trainee Management Agency is responsible for coordination and progress, but the efficiency of the training pipeline and the quality of trained personnel relies on the alignment of all Fleet elements.

Fleet Training Activities

Fleet Command's mission is to 'To provide the right forces at the right time, capable of fighting and winning at sea. This mission is expressed via the Fleet Operating Concept which is designed to maximise training opportunities and achieve the required levels of preparedness through an annual combination of routine ships-in-company operations, simultaneous work-ups and exercises.

The overall catalyst for training activities, and resource allocation, is CDFs Preparedness Directive. This determines Chief of Navy's priorities, which are then promulgated through the Navy Activity Schedule (NAS) which formally details activities for the next three years. From the NAS flows the Fleet Activity Schedule, which provides a 12-month plan for all fleet units including ship availability, and the weekly Fleet Exercise Plan.

For operations, following receipt of a CDF Warning Order, Chief of Navy directs DGMAROPS to prepare, in conjunction with the Fleet Commander, the identified forces. DGMAROPS, on behalf of Chief of Navy, assumes the role of the Mounting Authority and directs Fleet Command via the Mounting Directive to become the Mounting Headquarters. Commodore Warfare's Force Generation Division undertakes mission analysis and develops a Mounting Instruction that directs supporting agencies to prepare force elements to conduct activities to meet the mission requirements. As required, training is delivered to support mission readiness.

Various authorities successfully engage and control the unit to facilitate, direct and certify a range of preparatory activities, including training. The handover for collective training is an intrinsic part of the formal Sea Release Assurance Framework (SRAF) and is the action where the respective Force Commander, Commodore Warfare and the ship's commanding officer agree on the ship's status before the increased readiness training (work-up) can begin. Training and all other preparedness actions culminate in the unit being formally handed over to CJOPS for use on operations/high level exercises, upon completion of which, the unit is formally handed back to the Fleet Commander for reconstitution. The RAN Fleet Operational Continuum, leading to the desired Defence Preparedness Requirements (DPR) is illustrated at Figure 6.1.

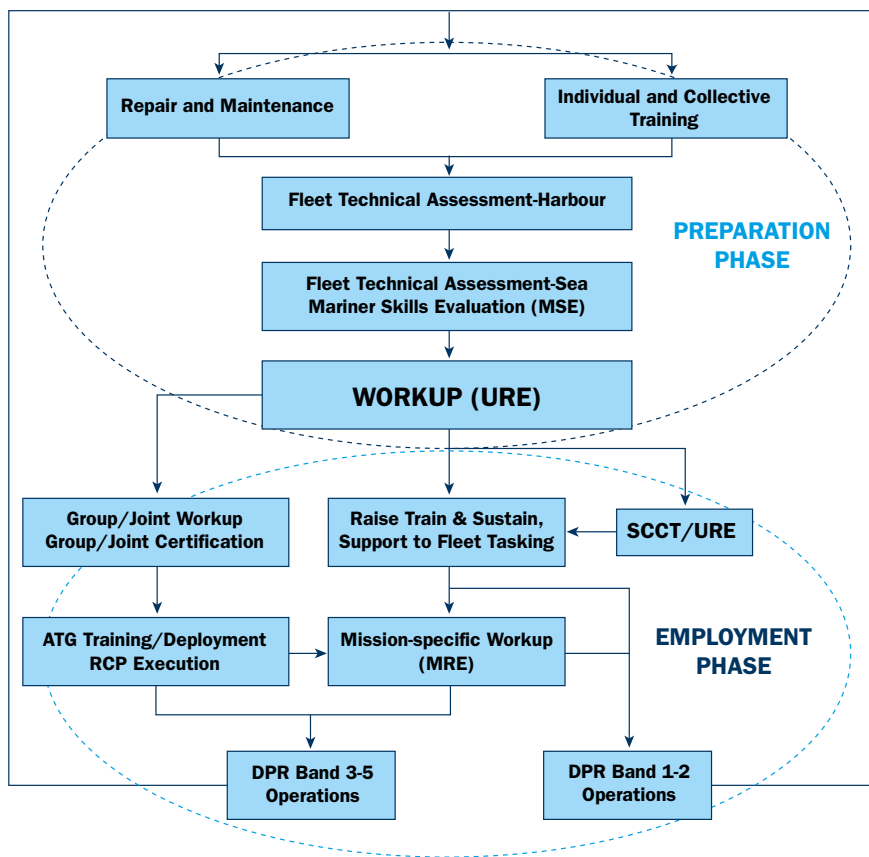


Figure 6.1: The Royal Australian Navy Fleet Operational Continuum





7. LEGAL ASPECTS AFFECTING MARITIME OPERATIONS

- The United Nations Convention on the Law of the Sea 1982 defines maritime zones within which certain activities may or may not take place.
- Warships have particular rights and duties within specified zones that influence how naval operations are conducted.
- The Law of Armed Conflict places specific restrictions on how warfare is conducted at sea.

THE UNITED NATIONS CONVENTION ON THE LAW OF THE SEA 1982

The *United Nations Convention on the Law of Sea 1982* (UNCLOS) entered into force for Australia and other original states parties on 16 November 1994.

At the time of writing, 167 states and the European Union were party to UNCLOS and 14 additional states had signed but not ratified it. UNCLOS introduces into treaty much pre-existing customary international law such as the concepts of innocent passage and high seas freedoms. UNCLOS also describes recent developments in the law of the sea such as the Exclusive Economic Zone (EEZ), the concept of deep seabed mining as the common heritage of humanity, and the concept of the archipelagic state.

The Legal Position of Warships

A warship has sovereign immunity and therefore is not subject to local jurisdiction in foreign waters and remains under the exclusive jurisdiction of its flag state. No legal proceedings may be taken against a warship and no official of a foreign state is permitted to board it against the wishes of the commanding officer. A warship cannot be arrested, detained, or searched and the only sanction that may be imposed on it for breach of the coastal state's laws is to require it to leave the coastal state's waters. However, the existence of this immunity does not mean that the warship can disregard local law.

By accepting the hospitality of a host port the commanding officer and crew of a warship, on behalf of its flag state should, as a matter of courtesy, observe local regulations with regard to such matters as rules of the road, navigation, health and quarantine restrictions and pollution control. Failure to observe such local laws may afford good grounds for diplomatic protest by the coastal state to the warship's flag state. If a warship persists in committing offences against the coastal state law it could be required to leave the coastal state's internal waters or territorial sea. Importantly, in many ports agreement is reached between Australia and the coastal state in regards to how matters such as quarantine and immigration enforcement will be applied to the warship.

Boats carried onboard a warship are entitled to the same privileges and immunities in a foreign port as the warship itself. Ships' boats are required to show their naval ensign in order to claim the same privileges and immunities. Military aircraft and government ships/ aircraft operated for non-commercial purposes are also entitled to claim sovereign immunity, although aircraft have no right of over-flight in the territorial sea or internal waters.

The Legal Position of the Ship's Company

The privileged status of a warship does not extend to the members of the ship's company when ashore. The flag state and the host state may have entered into a status of forces agreement, or other bilateral arrangement, that governs the application of the respective criminal laws of each state over crew members. However, in the absence of such an agreement, crew members are subject to the local laws of the host state just like any other visitor when ashore. Once a member of a ship's company is on board the warship, local officials are not permitted aboard to execute an arrest warrant, or the like, without the permission of the commanding officer.

Maritime Zones

UNCLOS defines maritime zones, or subsets of zones, in which RAN operations may occur. Zones are measured from baselines, which normally follow the low-water line of a coastal state. Where the coastline is deeply indented, has fringing islands or is highly unstable, straight baselines can be used according to certain criteria in UNCLOS. Australia's baselines are calculated using a combination of the low-water line based on the lowest astronomical tide and straight baselines. Australia formally proclaimed its original baselines in 1983.

The maritime zones in UNCLOS (illustrated in figures 7-1 and 7-2) are:

- internal waters
- coastal waters
- territorial sea
- contiguous zone

- archipelagic waters
- straits used for international navigation
- EEZ
- continental shelf
- high seas.

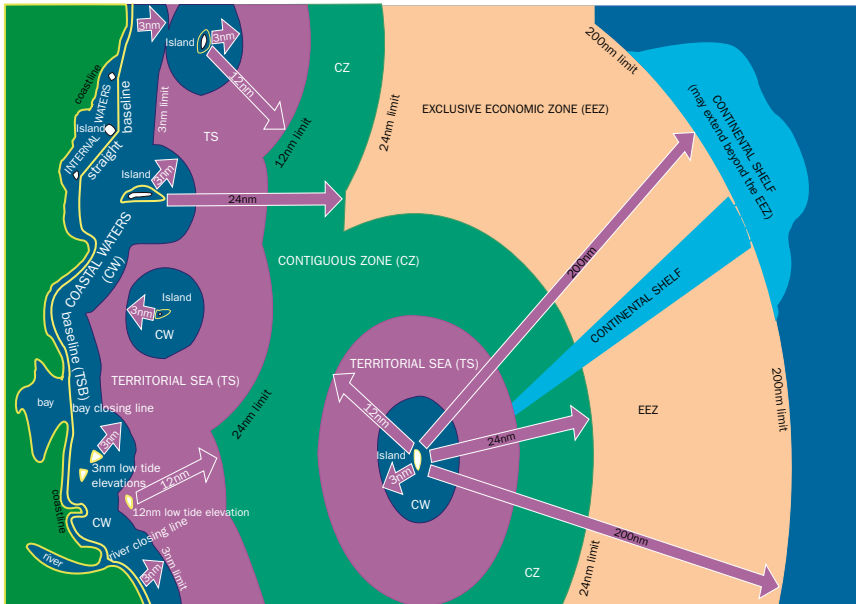


Figure 7-1: Maritime Zones

Internal Waters

Internal waters include ports and harbours, enclosed bays and gulfs, lakes, rivers and all inland waters. The coastal state has sovereignty over its internal waters, and has duties for the promotion of international intercourse, navigation, and trade which customary international law imposes upon it. Although there is no right of innocent passage in internal waters, there is an expectation of transit through to a port or harbour for foreign vessels that are engaged in trade. Nevertheless, a coastal state may still close its internal waters to foreign vessels and warships must always seek diplomatic clearance for permission to enter.

Coastal Waters

Within Australia, the Commonwealth has ceded administrative control of the first 3 nautical miles (nm) of the territorial sea to the States and the Northern Territory, this is known as coastal waters. As a result, within Australia there is a complex overlap and interplay between Commonwealth and State/Territory laws. The Commonwealth's right to use these waters for national purposes, such as defence or navigational aids, has been preserved. Criminal and fisheries legislation of the States' parliaments may apply offshore, and may be enforced by the States. As necessary, members of the ADF enjoy powers under Commonwealth legislation to enforce Commonwealth laws in relation to fisheries, customs, migration and other issues.

Territorial Sea

The coastal state has sovereignty over its territorial sea, which usually extends up to 12 nm from the baselines determined in accordance with UNCLOS.

Innocent Passage through the Territorial Sea

Ships of all states enjoy the right of innocent passage through territorial seas. Submarines are required to navigate on the surface and show their flag while undertaking innocent passage. Aircraft do not enjoy a corresponding right of innocent passage, as the airspace over a state, including its internal waters and territorial sea is regarded as the national airspace of that state. State aircraft seeking to overfly foreign national airspace must seek diplomatic clearance. Civilian aircraft must also seek diplomatic clearance or be flying in an air route recognised by the International Civil Aviation Organization. A coastal state may, on a non-discriminatory basis, temporarily suspend innocent passage for the protection of its security.

Although UNCLOS does not require prior notification for the entry of warships into the territorial sea, there remains a long-standing debate as to whether a coastal state can require prior notification or authorisation as a prerequisite for the enjoyment of innocent passage by warships of a foreign state. Importantly, there is nothing in UNCLOS that would require such a prior notification and Australia does not recognise the requirement.

The Contiguous Zone

Within the contiguous zone, which lies immediately beyond the territorial sea, UNCLOS permits the coastal state to exercise the control necessary to prevent and punish infringement of its fiscal, immigration, sanitary and customs laws within its territory or territorial sea. The contiguous zone may not extend beyond 24 nm from a state's baselines. The coastal state does not have sovereignty over the contiguous zone, but only certain sovereign rights. Apart from the caveats implied by these enforcement rights and the inclusion of the contiguous zone within the EEZ of a coastal state, high-seas freedoms apply in the contiguous zone. Given this, maritime operations are unaffected by the contiguous zone of a coastal state except where such operations would infringe the coastal state's customs, fiscal, immigration and sanitary laws.

Archipelagic Waters

An archipelagic state comprises one or more groups of islands, which are so closely interrelated that the islands and interconnecting waters form an intrinsic geographical, economic and political entity, or have historically been regarded as such. The ratio of the area of water to the area of land within the archipelagic baselines must be between 1:1 and 9:1. Examples of archipelagic states are Indonesia and The Philippines.

The archipelagic state has sovereignty over its archipelagic waters and may also draw baselines to enclose internal waters. The territorial sea, contiguous zone and the EEZ are measured from the archipelagic baselines bounding the archipelagic state. Warships have a right of innocent passage when transiting archipelagic waters, but must obtain diplomatic clearance to enter any internal waters. Aircraft have no right to overfly archipelagic waters, except when transiting archipelagic sea lanes.

The archipelagic state may designate archipelagic sea lanes and air routes above them that are suitable for the continuous and expeditious passage of foreign ships and aircraft through or over its archipelagic waters. In these archipelagic sea lanes, all ships and aircraft enjoy the right of archipelagic sea lanes passage in the normal mode which permits aircraft to transit and submarines to transit submerged. Ships and aircraft other than state vessels conducting archipelagic sea lanes passage are to comply with generally accepted international regulations, procedures and practices for the prevention, reduction and control of pollution. While the archipelagic state has the right to temporarily suspend innocent passage through its archipelagic waters, where such suspension is essential for its security and after due notification, it cannot suspend or hamper archipelagic sea lanes passage.

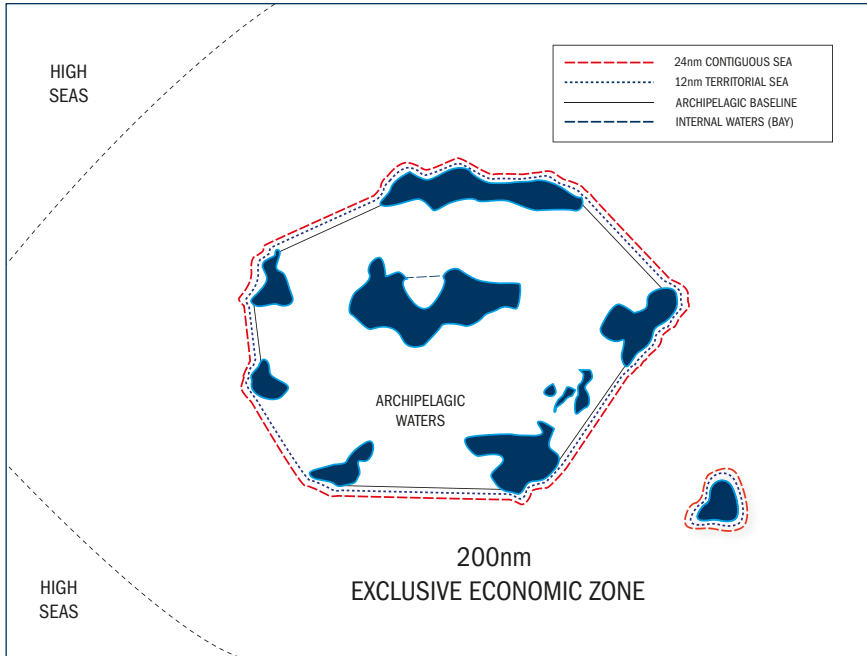


Figure 7-2: Archipelagic Waters

If the archipelagic state does not designate such sea lanes, or where the designation is only partial, the right of archipelagic sea lane passage may nevertheless be exercised by all nations through routes normally used for international navigation and over-flight. Archipelagic states may designate traffic separation schemes. Ships have the right of innocent passage through archipelagic waters that do not fall within archipelagic sea lanes, but not through duly promulgated internal waters.

Straits used for International Navigation

Ships enjoy the non-suspendable right of transit passage through straits used for international navigation. These straits are defined as ‘straits which are used for international navigation between one part of the high seas and another part of the high seas or an EEZ’. Importantly, states bordering straits, alone or in cooperation with other states, may adopt laws and regulations relating, inter alia, to the prevention and control of pollution in transit passage through straits used for international navigation.

Ships may transit in normal passage mode and must comply with generally accepted international regulations, procedures and practices for safety at sea and the prevention, reduction and control of pollution. When undertaking transit passage, ships and aircraft shall proceed without delay through or over the strait, refrain from any threat or use of force against the sovereignty, territorial integrity or political independence of the bordering states, or in violation of the UN Charter, and may only conduct activities incidental to their normal mode of continuous and expeditious transit.

Under UNCLOS, the regime of transit passage does not apply where:

- there is a high seas or EEZ route of similar convenience
- the strait is formed by an island and its mainland.

The general freedom of navigation exists through these alternative routes of similar convenience. Where the route of similar convenience lies through the high seas or EEZ, the vessel is not bound to exercise continuous and expeditious strait transit and may loiter or conduct other manoeuvres. Ships entering the territorial sea of a state when using a route of similar convenience are conducting innocent passage.

Exclusive Economic Zone

The EEZ is an area beyond and adjacent to the territorial sea, and it shall not extend beyond 200 nm from the baselines from which the breadth of the territorial sea is measured. The sovereign rights of the coastal state within the EEZ include the right to:

- establish and use artificial islands, installations and structures
- conduct marine scientific research and the protection and preservation of the marine environment
- conduct exploration, exploitation, conservation and management of the natural resources, whether living or non-living, of the waters super-adjacent to the seabed and of the seabed and its subsoil.

The rights given to coastal states must be exercised with due regard to the rights and duties of other states, acting in a manner compatible with UNCLOS provisions. Measures that may be employed to enforce the laws and regulations of the coastal state include boarding, inspection, arrest and judicial proceedings.

The EEZ regime preserves the high-seas freedoms of navigation, over-flight, submarine cable laying, and other internationally lawful uses of the sea related to these freedoms, including the operation of ships and aircraft. Where rights are not allocated, any conflict is to be resolved on the basis of equity in light of all the relevant circumstances, taking into account the respective importance of the interests of the parties involved as well as to the international community as a whole.

Despite declarations by some countries that seek to limit such military operations, in the EEZ, UNCLOS allows maritime forces to operate with few, if any, constraints. However, states exercising their rights or conducting military activities in another state's EEZ shall have due regard to the interests of the coastal state.

Continental Shelf

The continental shelf of a coastal state comprises the seabed and subsoil of the submarine areas that extend beyond its territorial sea, throughout the natural prolongation of its land territory, to the outer edge of the continental margin, or to a distance of 200 nm from the baselines used to measure the breadth of the territorial sea, where that outer edge does not extend up to that distance. A coastal state has sovereign rights for the purposes of exploring the continental shelf and exploiting its natural resources. A coastal state has the exclusive right to construct and regulate the establishment and use of artificial islands, installations and structures, such as oil platforms on the continental shelf. Foreign flag vessels enjoy high seas freedoms over the continental shelf subject to the rights of the coastal state.

The continental shelf can, based on the configuration and geomorphology of the seabed, extend far beyond the 200 nm of the EEZ. Where the shelf extends beyond 200 nm, under UNCLOS, a coastal state will have to lodge data supporting such a claim to the Commission on the Limits of the Continental Shelf, a body established by UNCLOS. Australia successfully made such a submission in 2004. It is important to note that, where the continental shelf does extend beyond 200 nm, the coastal state will only have jurisdiction over the water column in the EEZ.

The High Seas

The concept of freedom of the high seas is a foundation stone of international law. It is based on the perceived characteristics of ocean space as indivisible and available. The concept that no part of the high seas can be subjected to a state's sovereignty is balanced by the requirement that high seas freedoms must be exercised with due regard to other states in the exercise of their freedoms and for peaceful purposes.

Peaceful purposes do not preclude a state from conducting military activities on the high seas. Instead, the phrase is a reiteration of the customary prohibition on the use of force contained in Article 2(4) of the UN Charter.

The ability of a state to exercise jurisdiction on the high seas arises from either universal jurisdiction, such as the piracy provisions of UNCLOS, or by virtue of being a flag state able to exercise jurisdiction over its flagged vessels. States may also influence the regulation of high-seas activities by involvement in the development of international instruments under the auspices of the International Maritime Organization. There are limited grounds upon which the warships of any state may board ships of any other flag state on the high seas. These include reasonable grounds for suspecting that:

- the ship is engaged in piracy
- the ship is engaged in the slave trade
- the ship is engaged in unauthorised broadcasting from the high seas
- the ship is without nationality
- though flying a foreign flag or refusing to show its flag, the ship is, in reality, of the same nationality as the warship.

States may also incur obligations or rights from other sources of international law that provide a basis for them to act on the high seas. For example, states have obligations and potential powers under both the *United Nations Fish Stocks Agreement 1995* and the *Convention for the Suppression of Unlawful Acts against Maritime Navigation 1988*. States are also obliged to cooperate in the suppression of illicit traffic in narcotic drugs and psychotropic substances engaged in by ships on the high seas contrary to international conventions.

Maritime Boundaries between States

States with opposite or adjacent coasts may need to enter into a maritime boundary agreement to define the extent of their maritime zones. UNCLOS provides little guidance on how maritime boundaries are to be delimited where zones potentially overlap but it does indicate how boundaries for the territorial sea, EEZ and continental shelf may be concluded by agreement, or be determined in some other manner to produce an equitable result. Although such a result will often be an equidistant or median line between the coastlines, this will not always be the case. State practice has indicated other criteria may be relevant in the delimitation of a maritime boundary, such as historic use or natural prolongation of the coastline. The International Tribunal for the Law of the Sea plays an important role in maritime boundary disputes but has yet to develop a definitive methodology.

Australia shares maritime boundaries with France (Pacific and Indian Ocean Territories), the Solomon Islands, Papua New Guinea, Timor Leste, Indonesia, New Zealand, and Norway (in the Australian Antarctic Territory). Australia has aimed to achieve workable and practicable maritime boundaries with its neighbours and as a result, most of Australia's maritime boundaries have been determined. Australia's flexible approach in negotiating with other states has resulted in some of the most complicated maritime boundaries in the world. For example, Australia's agreements with Indonesia resulted in different boundaries for the EEZ and for the continental shelf, such that sections of Australia's continental shelf are located under the water column of Indonesia's EEZ.

Hot Pursuit

UNCLOS provides for hot pursuit, which enables a coastal state to exercise jurisdiction over foreign vessels and foreign nationals on the high seas if there is good reason to believe a ship has violated the laws or regulations of the coastal state in its internal waters, territorial sea, contiguous zone, EEZ or on the continental shelf.

The pursuit must be conducted by a clearly marked and identifiable government vessel or aircraft and it must be commenced whilst the foreign ship, or one of its boats, is within the internal waters, territorial sea, contiguous zone, EEZ or on the continental shelf of the coastal state where the relevant law or regulation is in force. Pursuit commences after a visual or auditory signal to stop, at a distance that enables it to be seen or heard, has been given to the foreign ship. It should be commenced as soon as the offence is detected and it must be continuous, although the pursuit need not necessarily be by the same vessel or aircraft.

The right of hot pursuit ceases as soon as the pursued ship enters the territorial sea of its own state or a third state. If the ship is stopped or arrested outside of the territorial sea, when hot pursuit is not justified, the owner of the ship is entitled to compensation for any loss or damage it may have sustained.

LAW OF ARMED CONFLICT

The Law of Naval Warfare

UNCLOS does not address the law of naval warfare or the law of armed conflict at sea. While many of its provisions are relevant to naval warfare - such as those specifying the maritime zones in which armed conflict can occur - in the main, it is necessary to consult customary international law and treaty law to ascertain relevant legal principles. The law of armed conflict, as applied to the means and methods of warfare at sea, is known as the law of naval warfare. This law can be found in customary international law, various Hague Conventions, and the four 1949 *Geneva Conventions* and their 1977 *Additional Protocols*. In 1994, a group of naval experts and lawyers published the *San Remo Manual on International Law Applicable to Armed Conflict at Sea*, which was an attempt to document customary international law in relation to naval warfare. Although the *San Remo Manual* is not a legally binding document, it is a useful guide to contemporary laws of naval warfare. Additionally the manual in many cases reflects legally binding principles of customary international law.

In terms of the geographic limitation of conflict, hostile action is allowed in the belligerents' territorial sea, archipelagic waters, internal waters, EEZ and continental shelf. It is permitted with due regard to the EEZ and continental shelves of neutral states, but is not permitted in their territorial seas, archipelagic waters or internal waters. Enemy warships, military aircraft, and naval and military auxiliaries may be attacked, destroyed or captured in the areas as outlined above. Enemy merchant vessels are subject to capture and, in certain situations, may also be attacked if they meet the definition of a military objective.

In accordance with the Second Geneva Convention, appropriately marked military hospital ships that are built or equipped solely for the purpose of assisting the sick, wounded and shipwrecked may not be attacked or captured. However, the fact that a warship may have a medical facility on board does not make it a hospital ship.

There are other peculiar aspects of the law of armed conflict that pertain only to maritime forces. For example, it is legally prohibited for land forces to disguise themselves as civilians or as the enemy. Yet a warship is permitted to disguise itself provided it reveals its true character before engaging an adversary. While this is a permitted ruse of maritime war, under customary international law warships are prohibited from feigning protected status, such as being a hospital ship, a shipwreck, or anything else which 'invites the confidence' of the adversary to believe that it is entitled, or is obliged to accord protection under the rules of international law with intent to betray that confidence.

OTHER OPERATIONS AT SEA

Blockade and Visit and Search

Traditionally, a blockade could be established by a belligerent force against the coast and ports of its adversary to prevent vessels entering and leaving the enemy coastal state. Under customary international law, a blockade has to be declared and notified in advance to give sufficient time for vessels to leave the intended blockaded area; the declaration has to state the duration, location and extent of the blockade; it has to be applied impartially to all ships of all nationalities; and it has to be effective. A vessel that breaches the blockade is liable to be attacked.

Once an armed conflict has begun, warships have a belligerent right of visit and search that enables them to visit a vessel to determine the true character of that vessel. Merchant vessels are obliged to provide information about their flag, destination and cargo. The regimes of blockade and visit and search are legally different from operations authorised under UN Security Council Resolutions. However, in operational practice there are obvious similarities. It is also possible that both the law of naval warfare and UN Security Council enforcement regimes may simultaneously apply to the same naval operation.

United Nations Operations

Under the UN Charter, where the Security Council determines that a situation exists that threatens international peace and security, it can take action to maintain or restore international peace and security including demonstrations, blockade, and other operations by air, sea, or land forces of members of the UN. The Security Council could, for example, pass a binding resolution that calls for member states to enforce a sanctions regime against a particular state. Member states could use the belligerent rights of blockade and visit and search to implement and enforce a UN Security Council Resolution.





8. GAINING SEA CONTROL

- Sea control is a fundamental concept of maritime strategy and helps to describe in abstract terms what navies do.
- Sea control is an essential element of every campaign or major operation in which Australia is involved.
- Sea control enables maritime power projection and governs the use of sea lines of communication.

What is Sea Control?

As defined by the RAN, sea control is the condition that exists when one has freedom of action to use an area of sea for one's own purposes for a period of time and, if necessary, deny its use to an adversary. Sea control applies to the airspace above and the water mass and seabed below the sea surface, as well as to the electromagnetic spectrum. To an increasing degree it also includes knowledge, space-based and other external assets that provide fused information to the commander at sea.

Sea control is a relative term, which acknowledges that most navies will be able to seek and maintain it only for limited periods in limited areas. Even then, sea control may remain contested and the aim will be to destroy, disable or otherwise isolate enough of an opponent's forces to enable successful completion of the mission. This focus on the mission is an essential characteristic of sea control, in that it is intrinsically about the use of the sea and not simply its possession.

Similarly, although sea control will be needed throughout the full spectrum of maritime operations, the extent to which it will be needed and contested will depend on the operation's nature. For example, when conducting counter-piracy operations, sea control may be needed only for brief periods in limited areas, and achieved through the provision of close escort or recommendations for merchant vessels to adhere to designated routes. By contrast, during the opposed landing of an amphibious force, sea control may be needed throughout a relatively large area, across multiple domains and for an extended time period.

The RAN identifies five degrees of sea control:

- **Absolute sea control.** A force has complete freedom to operate and its adversary cannot operate at all.
- **Working control.** A force has the general ability to operate with a high degree of freedom and its adversary can operate only with high risk.
- **Control in dispute.** Each side operates with considerable risk, as each tries to establish working control for limited periods in support of specific operations.
- **Adversary working control.** A force can operate only with high risk as the adversary has a high degree of operating freedom.
- **Adversary absolute control.** The adversary has complete freedom to operate and your force is powerless.

Working control is the degree of sea control to which most navies now generally aspire; that is to say, control needs to be exercised over a limited volume of ocean and airspace for a limited period of time. Furthermore, where sea control is lost or simply denied, it does not automatically accrue to the adversary. Whatever the operational circumstances, the possession of sea control must never be assumed, and one must always be prepared for it to be contested. This applies especially in the complex littoral environment, where an adversary may have access to multiple capabilities for denial.

Why Do We Seek Sea Control?

Establishing or possessing sea control is essential in almost every conceivable operation mounted by a maritime nation. Whether an operation is intended to defend the homeland or be expeditionary in nature, every element of military force travelling to or from that nation must pass either over, on, or under the sea. Retention of the freedom to use the sea is therefore crucial to pursuing national objectives.

Today, the sea remains the great global commons over which the vast majority of world trade flows. For centuries, navies have protected this trade from evolving threats. This role is most commonly referred to as the protection of sea lines of communication. But, just as sea control is about using and not possessing the sea, so too the protection of sea lines of communication is about ensuring the safe movement of shipping, and the trade it carries, not protecting areas of ocean for their own sake.

Another long-standing naval role is to project power ashore. Maritime power projection can take a variety of forms, including the landing of amphibious or special forces, the delivery of seaborne land and air forces, or bombardment by guided or unguided weapons. Only larger navies possess the capabilities to project power ashore in a contested environment. The corollary is that, unless acting with multinational forces, the capacity of lesser navies to contribute to maritime power projection is inversely proportional to the level of threat. Nevertheless, virtually all navies are capable of some level of maritime power projection even if only humanitarian assistance and disaster relief (HADR) operations, and in interventions designed as part of a peace operation. In every case, sea-based operations have the significant advantage of being able to sustain their activities without reliance on land-based support.

In the case of Australia the ADF will need to seek and maintain sea control for several specific reasons. First, there is the need to ensure freedom of action for our maritime forces and hence maintain the initiative. Without that freedom, operations in support of our security can only ever be reactive.

Second, there are many shipping routes (sometimes known as sea lanes) over which vital raw material and energy cargoes are transported to, from and around Australia. These include iron ore, oil and gas from north-western Australia and the coal trade from east coast ports through the archipelagos to the north and on to ports in Asia. They also include the oil import routes across the Indian Ocean and through the archipelagos from Southeast Asia. Other important shipping routes through the Indian and Pacific oceans and also through the seas to the north are used to carry manufactured goods to and from Australia. Our far northern population centres, in particular, are almost wholly dependent on supply by sea.

Third, the ADF may need to project maritime power ashore. For example the ADF has, with the approval of the affected governments, landed forces in several regional countries in recent years. The majority of these cases have been stabilisation operations, mounted to restore civil order, and examples include Timor Leste in 1999 and 2006, and the Solomon Islands in 2003. ADF personnel have also assisted with disaster relief in the wake of natural disasters, including the 2004 Boxing Day Tsunami in the Indian Ocean region, Typhoon HAIYAN that devastated the Philippines in 2013 and Cyclone WINSTON which struck Fiji in 2016. Ultimately, any significant ADF deployments beyond our shores will require the use of the sea and thus will rely on Australia's ability to maintain sea control.

Finally, the economic importance to Australia of offshore resources, notably oil, gas and fish, demands that access to these resources must be assured. Just as important, these resources must be denied to those not entitled to exploit them.

In summary, sea control is sought as the primary means of enabling maritime forces to achieve their operational objective. Ultimately this is about creating an effect on land, such as the safe delivery of trade, stabilisation of fragile nations or assistance following a natural disaster. Sea control may provide the freedom to deal with threats at their source, which is the most tactically effective and in some cases the only way of doing so. Consequently, nations that depend on the sea should have an operational doctrine that is offensively minded, to the extent that they should not be prepared to concede sea control to others.

ACHIEVING SEA CONTROL

For the ADF, technological developments and the regional proliferation of sophisticated weapons mean that methods of achieving sea control must constantly be examined and, if necessary, adapted. Assuming that sea control is not being routinely contested as part of an ongoing campaign, then traditionally there are three methods by which sea control has been sought, each with its own advantages and limitations. These are:

- decisive battle
- attrition
- blockade.

Decisive battles involving main fleets engaged in direct confrontation have not been seen since World War II (WWII). This is not to say that they will not reoccur at this scale, only to suggest that they will remain rare events. Such actions were decisive normally because the ships lost could not be readily replaced. Heavy losses by one side also lessened their ability to contest sea control, and granted a certain degree of freedom to their opponent. Yet battles that appeared to be decisive at sea did not always translate quickly into decisive outcomes on land (i.e. Imperial Japanese Navy forces were decisively defeated at the battle of Midway in 1942 but the land war and island hopping campaign in the Pacific continued on for another three years).

For a small to medium-power navy, acting independently, opportunities to fight a successful decisive battle are likely to remain limited. Hence a more appropriate approach is to attain sea control by neutralising enough of an adversary's forces to deter, distract or prevent further intervention in one's own operations. The effect may only be short-term and extend over only a limited area, but it need only be sufficient to achieve the aim.

Relying on attrition to gain sea control is more problematical still, as it represents an attempt by an inferior force to overcome a superior one. Simply, the concept is that an inferior force, by initially avoiding large engagements and instead harassing and causing cumulative losses, can sufficiently alter the balance of forces to eventually win a decisive battle and thus gain sea control.

Japanese Naval Planning before World War II

For some years before World War II, the Imperial Japanese Navy (IJN), an inferior force, considered how best to destroy a stronger US Navy fleet steaming across the Pacific. In essence, the plan was to neutralise the relatively limited American forces already deployed in East Asia and then intercept and ambush their main fleet with a decisive battle in Japanese waters. For this plan to succeed, the US fleet had to be significantly reduced in comparison with the main Japanese fleet early in the war, largely by ongoing attacks during its expected trans-oceanic passage. However, the doctrine of a limited war followed by a decisive battle, placed undue emphasis on the Japanese battle fleet and big guns at the expense of other areas of naval force structure. Moreover, the inherent limitations of the strategy were further compounded, when the very act of going to war and its initial conduct ignored both the basis of pre-war planning and the vastly greater production capacity of American industry. Ultimately, it was the IJN's fate to be destroyed in detail, while the collapse of Japan's war effort came about through a failure to protect its far-flung sea lines of communication.

Although an attritional approach has elements of the defensive, it is not meant to be entirely passive. Indeed, for it to have any chance of success, the strategy must make every effort to keep the opposing force off-balance. Nevertheless, because the approach involves considerable risk it would generally be employed only when there is no reasonable alternative.

The third method of achieving sea control is through either close or distant blockade. In the former case, the aim has generally been to position near enough to an opponent's bases to prevent their ships from escaping, while accepting that these operations are time consuming and physically demanding on one's own ships and crews. In the latter case, more latitude was allowed the opponent's forces, possibly encouraging them to sortie, and thereby providing an opportunity to defeat them in battle.

One of the enduring benefits of close blockade is the advantage it confers with respect to knowledge of the opponent's whereabouts. This generates enhanced freedom of action for one's own forces not engaged in the blockade operation. However, close blockade by surface forces has been made more difficult since the development of mines, submarines and aircraft. Friendly submarines, by contrast, have the ability to operate off hostile coasts undetected for extended periods. The presence of submarines off an adversary's coast can also be a powerful indicator of intent; as even the suspicion of their presence will inevitably complicate the opponent's calculations. The potential impact of submarines in these circumstances can be gauged from the reluctance of the Argentine Navy to remain at sea after the sinking of the cruiser *General Belgrano* by a British submarine during the 1982 Falklands War.

At this point, the use of the term blockade needs to be clarified. Historically, a blockade has been used either militarily to prevent adversary forces from sailing, or economically to prevent the import or export of goods from ports. Blockades may also be considered as acts of war, and hence there are conditions specified for their enactment. Specifically, to have had legal status, blockades had to be both declared and effective – that is, capable of preventing access to or egress from the opponent’s coast or ports. These requirements have lost much of their force as close blockades have given way to the distant variety, which amount in many cases to interception or destruction of an adversary’s ships on the open ocean.

For the purposes of gaining sea control, the concept of blockade has also evolved. The future focus is more likely to be on what Admiral Stansfield Turner, USN, referred to as ‘sortie control’, through which individual adversary units are destroyed as they deploy. Reflecting contemporary realities, the concept relies on effective and persistent Intelligence, Surveillance and Reconnaissance (ISR), coupled with offensive options including submarines, mines and air power. Turner’s concept also considers chokepoint control as another form of military blockade, in which the blockading effort is mounted at points through which opposing forces must transit (such as in narrow straits). Although Turner’s concepts were a product of the 1970s, they do retain relevance, not least for the ADF which operates in an increasingly complex regional environment, in which there are many potential chokepoints.

In addition to the three traditional methods of gaining sea control, there may also be opportunities to achieve the objective of sea control - use of the sea for some purpose - without contesting that control. For example, if the safe and timely arrival of merchant shipping can be achieved by suggesting alternative routing which avoids potential threats, then that option should be exercised.

Operations When Sea Control Remains Contested

Sea control is best achieved before other maritime operations are carried out, but in practice maritime operations are rarely so simple. The French naval strategist Admiral Raoul Castex, for example, deals at some length with the risk associated with being fixated by the need to gain sea control before attempting any other operation and the consequent need for flexibility in approach. Thus, if the ultimate objective is to put forces ashore, and a time imperative exists, then it may be impractical to ensure sea control before beginning the landing operation. As previously stated working control may be the best that can be achieved and some risk to ones own forces may have to accepted.

Applying Sea Control in the Falklands War (1982)

The British amphibious assault in San Carlos Water during the 1982 Falklands War is an excellent example of a landing operation conducted with the air aspects of sea control still being contested. In this case, the British commanders judged that complete sea control could not be achieved in a reasonable time, but they determined that the inherent risks needed to be accepted to enable the recapture of the Falklands before the two British aircraft carriers reached the limit of intensive flying operations and bad weather precluded further actions. Subsequently, heavy losses were inflicted on the British fleet by Argentine air power, but the British were able to achieve a successful landing and breakout, allowing for the eventual recapture of the islands.

The ADF can reasonably expect to operate as part of a US-led force in a major conflict and can also expect to have multinational support in many other levels of operations. There is, however, no certainty that even with such support that the RAN will always conduct operations as part of a superior force. Consequently, ADF planning must allow for operations in which sea control cannot be guaranteed, or where it remains contested throughout a mission.

The main planning factors in such operations will be the weighing of risk against the importance of achieving the objective. A failure to achieve a sufficient level of sea control, before attempting either to project maritime power ashore or provide protection of sea lines of communication, will almost inevitably expose one's forces to greater potential losses. For a small maritime force every unit is likely to be high-value, and the loss of any one may be a serious or even a crippling blow.

The risk of loss must be accepted as a part of the cost of conflict, however, it must also be kept in mind that warships are inherently resilient and designed to be placed in harm's way. Resilience can be measured by the capacity of a warship to regain operational status after being damaged. The RAN's main focus must therefore be on the competence and toughness of our people, so that we can rely on sensors and weapons being used to maximum effect.

The Role of Air Power in Achieving Sea Control

Air power has become a vital and integral facet of sea power but, apart from organic helicopters, very few navies can afford to carry their own air power with them. Although helicopters can offer significant capabilities in surface and underwater warfare, there is much that they cannot provide. The RAN, in particular, must rely on others to provide broad area air, surface and under-sea surveillance as well as any air combat capability for counter air or strike operations.

The growing use and importance of unmanned aerial systems (UAS) may provide some relief in this respect. At the very least, surface combatants in the future should be able to embark UAS capable of providing short- and medium-range aerial surveillance. Nevertheless, depending on the circumstances, reliance on foreign military services for the provision of air power may carry some operational risks. For example, if RAN units are integrated with US Navy forces they may well benefit from the embarked air power of a carrier battle group. In the event of working with multinational partners without embarked air power, however, an Australian maritime task group must necessarily rely on land-based air power.

There are several limitations associated with reliance on land-based air power. For operations away from the Australian mainland, ongoing air-to-air refuelling (AAR) or secure forward operating bases relatively close to the area of operations will be needed. Unfortunately the use of AAR to support aircraft beyond their unrefuelled range introduces an additional level of vulnerability while, even with such basing, assured air power will still only be available when the maritime operation enjoys a high priority for the allocation of resources. Without forward basing, the situation becomes even more problematic.

Moreover, the further aircraft have to transit from land bases and the more they will need to rely on AAR, the more they will be limited in the weapons and stores they can carry. This will affect both their time on task and their effectiveness while there. Responsiveness also becomes an issue, and the provision of a combat air patrol for a deployed maritime force is more challenging as the distance from land bases increases. The ability to respond immediately to a demand for air cover could be vital for the success of an operation and can depend on adequate threat warning. Such warning may itself depend on the availability of land-based surveillance aircraft.

A lack of available air power may, in some cases, greatly hinder or entirely compromise deployed operations. Without either surveillance or combat aircraft, or even both, surface forces must depend almost completely on their own resources. This implies a potential loss of warning time against low-flying threats and an associated dependence upon short-range detection and rapid reaction. Although the *Hobart*-class destroyers will have a reasonable capability to deal with such threats, particularly when networked with remote sensors, there are few of these vessels.

The absence of friendly tactical combat aircraft provides much greater freedom of action for an adversary's air power. This translates into more thorough and accurate enemy surveillance and ultimately more attack options for an opposing force. Consequently, it also demands changes in the mode of operations for friendly surface forces, perhaps constraining where and how they operate. In extreme situations, surface operations may need to be curtailed.

If sea control is being sought through offensive maritime operations, the full range of maritime air power capabilities is essential. It begins with broad area surveillance of the air, surface and sub-surface environments and also includes focused reconnaissance of the projected area of operations. Although airborne early warning and control and maritime patrol aircraft can provide much of the effort, they may be supplemented by satellite and over-the-horizon radar coverage. Short-range reconnaissance is provided by embarked helicopters and increasingly UAS will play a significant role. Depending on the nature and extent of any threat, tactical combat aircraft may be employed both for counter air and strike operations. Suitably armed helicopters may also be used against surface and sub-surface targets.

Where sea control is being sought through the use of attrition, a similar demand for air power can be expected, but with an emphasis on activities aiming to defeat in detail, without necessarily engaging a superior force in detail. Tactical combat aircraft may also be needed for counter air and strike in a defensive rather than an offensive role.

Where blockade is the method chosen to gain sea control then air power is likely to play a more indirect role, by supporting naval forces primarily through long-term surveillance and reconnaissance operations.

Sea control will not always be contested and there are many operations that can be conducted with little or no expectation of threat or interference. In such situations, there may still be a need for air power in the form of surveillance and strike as required.

Gaining Sea Control in the Future

In considering the challenges to be faced in gaining sea control in the future, one must first question whether it will be needed. That is, will there still be a need to maintain freedom to use the sea as and when required?

Currently, there exists no feasible alternative to the use of sea transport to move the vast amounts of raw materials, energy and manufactured goods that continue to fuel the global economy.

The continued requirement for maritime power projection also appears assured, even if rarely in the form of large-scale contested amphibious landings. A flexible range of relevant capabilities are being developed in the ADF and, although it is not possible to predict how or whether these forces will be used in combat, recent experience suggests that there is a continued demand for the projection of power across the spectrum of operations. Whether sea control is contested in such future operations cannot be determined in advance, but having sea control is something that the ADF must never take for granted.

Threats to surface forces also continue to emerge in both conventional and unconventional forms. These may range from long-range air and sub-surface guided weapons through to small boat swarms (including remotely operated surface vessels) and terrorist attacks.

Despite these threats, surface combatants continue to be needed to gain sea control, meaning that a broad range of counter-actions, including operating concepts, must be developed. Early detection is the key to successful defence, suggesting that warships will need an autonomous surveillance capability well beyond that currently available.

The Guiding Principle

The guiding principle that links the key maritime operational concepts is that maritime forces seek to establish sea control in order to:

- conduct the military task of maritime power projection; and
- maintain the use of sea lines of communication by military, commercial and private shipping.





9. SEA DENIAL IN MARITIME OPERATIONS

- Sea denial, like sea control, may be limited in space and time.
- Protection of Australia's critical sea routes goes well beyond sea denial since sea lanes themselves can never be defended.
- There are few situations in which sea denial will satisfy Australian maritime operational demand, and most often only as a component of sea control.

In *Some Principles of Maritime Strategy* (1911), Sir Julian Corbett wrote, 'The object of naval warfare must always be directly or indirectly either to secure the command of the sea or to prevent the enemy from securing it'. Corbett's statement identifies clearly the two primary elements of naval or maritime warfare, and the challenge confronting naval planners at all levels.

For many nations, the need to be able to gain sea control defines their naval ambitions. On the other hand, there are coastal states that see little or no need for sea control outside their sovereign waters. For these nations, 'preventing the enemy from securing it' may be sufficient. This is the essence of sea denial as a separate concept to sea control.

Despite their inherent interconnection, the difference between the two maritime strategic concepts is substantial. Gaining and exercising sea control can demand application of the full range of maritime combat capabilities against equivalent capabilities possessed by the adversary. Depending on the circumstances, denying the use of the sea to an adversary may be successfully achieved with much more limited means.

Smaller navies are generally sea denial forces. They simply do not possess the range of capabilities needed to gain and assert sea control in a contested environment, even if they should identify such a need. Where sea denial is sought, there is not necessarily any intention (or need) to deny the sea entirely to an adversary, and it may well be impossible to do so. Thus, like sea control, sea denial may be limited in space and time.

Sea Denial as a Concept for Australia

Australia's defence policy describes the major tasks which the ADF must be able to carry out. Nomenclature sometimes changes, but in order of descending priority these tasks are:

- deter, deny and defeat attacks on Australia
- contribute to stability and security in the nearer region encompassing maritime South East Asia and the South Pacific
- provide meaningful contributions to military contingencies to ensure a stable Indo-Pacific region and a rules based global order.

Australia's maritime forces will inevitably contribute significantly to all these tasks, generally relying on the fact that sea control has already been established.

Deter, Deny and Defeat Attacks on Australia

Depending on circumstances, denying an adversary the use of Australia's sea and air approaches may be sufficient to prevent them from achieving their objectives. Sea denial operations could, if the adversary is unable to interfere, be mounted offensively against an opponent's bases and staging areas. These operations would be conducted primarily by submarines and could also involve strike aircraft, land-attack missiles and special forces. The primary aim of such operations would be to disable adversary forces before they present a threat to Australian interests. A secondary objective would be to make the bases, or other facilities, unusable for an opponent.

Operations against an opponent's bases or staging areas, also suggest operations beyond the Indonesian archipelago, with all of the complications inherent in that task. The more distant these operations, the more difficult they would be to mount and support, the more they would limit the kinds of forces that would be employed and the more likely they would be to involve support of a major ally. The fact that such distant operations might themselves demand the achievement of sea control, simply to gain access to the desired area of operations, emphasises the difficulty of Australia relying on sea denial as the basis of a maritime strategy.

An especially difficult task would be the protection of offshore sovereignty, including the strategically significant territories and resource platforms of Australia's remote north-west coast. If there was a need to insert land forces onto these assets, either to pre-empt adversary operations or to retake them, then sea control operations would still be needed to ensure the safe transit of our own forces. Safeguarding our critical shipping routes likewise goes well beyond sea denial, since the sea lanes themselves can never be defended. Instead, some level of protective operations, which amount to sea control, must be mounted for trade moving to, from or between Australian ports.

Contributing to Stability and Security in the Nearer Region

Security and stability challenges in maritime South East Asia and the South Pacific tend to be the result of domestic political problems or natural/man-made disasters. They can also be the result of illegal activities in maritime zones, including unregulated and unreported fishing and other criminal activities. Consequently, the ADF response is generally one of three kinds:

- Provision of a maritime presence, possibly together with land force operations, to restore stability and offer surveillance
- Patrol of maritime zones to prevent or disrupt illegal activities
- Humanitarian assistance or disaster relief operations possibly involving evacuation of affected persons.

These operations are generally conducted in circumstances of low military threat. In maritime South East Asia and the South Pacific the ADF could expect to lead any multinational force established to conduct stabilisation operations and, as has previously been the case (i.e. Solomon Islands) the military contribution may be as an element of a civilian-led operation.

Sea denial operations could be needed in two of the three sets of circumstances noted above. Stabilisation operations may involve preventing the movement by sea of hostile elements intent on causing disruption, and include surface patrols of likely sea routes together with aerial surveillance if circumstances warranted it. Since ADF forces will still need to use the sea, in this case sea denial is being used as a subset of sea control.

In the second case, preventing or disrupting illegal activities in the maritime zones, aerial or other surveillance is needed to deter or determine the extent and location of illegal activities. However, surveillance must be backed up by surface forces capable of response and patrol to deal with vessels suspected of illegal activity. The remoteness and extended areas involved may pose additional challenges, but again sea denial operations would simply be a subset of sea control.

Contributing to Military Contingencies in the Indo-Pacific Region and maintain a Rules Based Global Order

The third highest priority task for the ADF is to contribute to military contingencies in the Indo-Pacific region and maintain rules based global order. There are two major aspects of the task:

- providing assistance to our Indo-Pacific partners in meeting external challenges
- fulfilling our alliance obligations and also supporting international partners against threats to the rules based global order.

Each aspect could require a substantial military contribution by the ADF, most likely operating with multinational forces. Concurrently, sufficient forces would also need to be retained to deal with any retaliatory military activity against the Australian mainland or offshore territories/installations. In either case sea denial operations would only take place as a component of sea control.

Support for Indo-Pacific Partners

ADF contributions in support of our Indo-Pacific partners could involve tasks ranging from HADR, to counter-terror or counter-piracy, resource protection, the protection of critical sea lines of communication and conventional combat. Of these tasks, counter-terror or counter-piracy, resource protection and conventional combat could involve aspects of sea denial but, again, only as a subset of sea control.

Counter-terror or counter-piracy operations in the region would involve patrols by surface ships supported by aerial surveillance, provided by regional and possibly Australian maritime patrol aircraft. The operations would most likely be mounted in known or suspected threat areas, such as shipping chokepoints.

Sea denial operations in the case of resource protection still include patrols by surface ships, supported by aerial surveillance and, depending on the force levels used or threatened by an adversary, might also include submarine operations for intelligence gathering and other purposes. The aim of patrols would be to prevent unauthorised resource exploration and exploitation in the EEZs of partner states and to prevent interference with legitimate activities there. The potential for conflict at this level would determine the exact nature of any ADF contribution.

Conventional combat in support of Indo-Pacific partners would provide the greatest challenge for the RAN and other ADF elements involved. The threat levels are likely to be high and providing assured levels of logistic support for extended operations would add to the difficulty. The maintenance of a high degree of sea control would be vital. Operations beyond the Indonesian archipelago would exacerbate the challenge. Sea control operations are conducted against an opponent's maritime power projection operations, which might be aimed at offshore territories or resource installations and potentially mainland targets. In the high-threat environment that would prevail in these circumstances the RAN can expect to participate as part of an integrated multinational force, bringing to bear the full range of combat capability in the air, on and below the surface.

Alliance Obligations to the United States

Fulfilling alliance obligations to the United States essentially means responding under the terms of the ANZUS Treaty. Although the Treaty does not commit either party to military action in support of the other, there is an understanding that, subject to the determination of the government of the day, in most circumstances that commitment would be made.

Any such conflict would demand sea denial operations as a component of sea control. Sea denial would be needed to prevent an adversary's movement by sea and their capability for maritime power projection. This requires high intensity maritime warfare and the Australian contribution would most likely include submarines and capable surface combatants. They could be supported by maritime patrol and strike aircraft if suitable bases were made available. Assured logistic support would be a determinant of the nature and extent of any RAN contribution.

Defending Against Retaliatory Operations

In the event that Australian forces were involved in conventional combat operations either locally or further afield, then sufficient forces would need to be kept at heightened readiness in Australia to counter any attempted retaliatory attacks against the mainland, offshore territories or resource installations. Defensive operations can involve denial of the maritime approaches as well as defence of ports and other potential coastal targets. Even in these circumstances, the focus needs to remain on sea control so as to ensure the protection of strategically important logistics and trade and for the support of deployed forces.

ACHIEVING SEA DENIAL

Historically, there have been four generally accepted ways of prosecuting sea denial strategies: blockade and exclusion zones, *guerre de course* (commerce raiding), attrition, and strike and interdiction. To at least some extent, each of these approaches remains relevant.

Blockade and Exclusion Zones

Blockade in its different forms is one means of achieving sea denial and as previously described can also be used to gain sea control. Blockade is a long-standing strategy and can take two general forms:

- **Economic.** Aims to prevent the movement of trade.
- **Fleet blockade.** Aims to prevent the movement of an opponent's warships. Both forms of blockade can be applied at the same time and place.

In a period of conflict, close blockade by surface warships is likely to attract higher risks, because of the threat posed by adversary submarines, mines and land-based anti-ship weapons. Thus, in circumstances of substantial threat, an effective blockade is more likely to be conducted by submarines, either in their own right or in combination with minefields and air power. These could be reinforced by surface forces operating in areas further afield, such as in the vicinity of straits or other chokepoints through which targeted shipping must pass.

Mounting a blockade to deter or defeat attacks on Australia by a major power would be unthinkable without the assistance of a major ally. The ADF simply does not possess the capabilities or capacity to apply and sustain the kind of concerted effort required. This would also be the case for blockades established in support of Indo-Pacific partners or to meet alliance obligations to the United States. Blockades used to contain regional terrorist or piracy activity may be achievable without the help of a major power.

Stabilisation operations in the local region may involve a form of blockade, in which surface warships could be used in conjunction with aerial surveillance to prevent infiltration. These operations involve protecting offshore resources, mineral or otherwise, within a nation's EEZ, in which case it might be seen as an exclusion zone for those against whom the operations are mounted. In these cases, the military threat level would probably not be high and a successful outcome should be easier to achieve.

A form of blockade known as 'sortie control operations' could be used against adversary forces approaching through the archipelagos to the north in retaliatory attacks against Australia. Exclusion zones might also be established on parts of the coast or around offshore resource platforms – in the Bass Strait and on the north-west shelf of Western Australia, for example. Aerial surveillance is vital, together with the ability to mount long-range strike against opposing forces. Anti-ship missiles – air, ship or submarine launched – would likely be the weapons of choice.

Sea Denial in the Falklands War

On 12 April 1982 the British Government imposed a 200 nm maritime exclusion zone around the Falkland Islands, to allow for the offensive use of naval forces. On 23 April the British warned that any approach by the Argentineans would amount to a threat and would be dealt with, and followed up on 30 April with the declaration of a total exclusion zone and a change in rules of engagement which permitted a submarine attack on the Argentine aircraft carrier outside the total exclusion zone (further amended on 2 May to permit submarine attacks on other Argentine surface ships). By this time the British submarine HMS *Conqueror* had been shadowing the Argentine cruiser *General Belgrano* for 24 hours. On receipt of the change in the rules of engagement she attacked on the evening of 2 May. *Conqueror* fired torpedoes that hit and sank the *General Belgrano*. The effect on the Argentine Navy was dramatic and by 4 May 1982 its ships had moved closer to the mainland and the cover from submarines provided by the shallow continental shelf. The Argentine surface fleet effectively took no further part in the battle, thereby negating the greatest threat to the British task force; that of the Argentine aircraft carrier. These actions constituted an exercise in sea denial by the Royal Navy as they effectively prevented the Argentine surface forces from using the sea for any useful purpose. This also helped the Royal Navy achieve an acceptable level of sea control for its own activities.

Guerre de Course

There has always been a close association between the military and mercantile aspects of sea power. Mercantile finance has routinely been used to fund the naval effort needed to protect mercantile trade. Likewise, there has also been a long-held realisation that interdiction of an opponent's trade was an effective means of attacking their economy and thus their capacity to wage war.

Commercial blockade, founded on maintaining sea control, has often been the preferred method of disrupting trade; but is not normally an option open to weaker maritime states. Instead interdiction of enemy trade on the high seas has been practised and come to be known as *guerre de course*. Among the best known applications of the concept are the campaigns waged by the German Navy, using submarines, surface vessels and aircraft, against Allied maritime trade in the two world wars of the 20th century. For a time these campaigns enjoyed considerable success, but ultimately failed in the face of improved tactics and superior Allied maritime forces.

There are, however, several considerations that would complicate the conduct of a modern *guerre de course*, possibly to the extent of rendering it ineffective. The first complication is that such a campaign would be illegal unless directed solely against targets meeting the definition of a military objective. The second is the need to identify the national trade that is to be interdicted and to ensure that only it is affected by the campaign.

In the classical *guerre de course* this was easier than it is today, because today's maritime trade is far more global and diversified, with cargo often carried in ships registered and owned by countries of convenience. A third complication is that a *guerre de course* is likely to need a significant period of time before having a substantial impact on an adversary's economy. Finally, modern ships, especially in the high-value container trade, carry goods destined for several countries, not all of which may be involved in the conflict. This problem may not be as challenging when considering single-cargo ships, such as oil and gas tankers, where the cargo's final destination may be determined relatively easily.

Attrition

Any large-scale, direct attack on Australia would likely require a response beyond the individual capacity of the ADF, almost certainly demanding activation of the ANZUS Treaty and followed by some level of US military involvement. Were such a response not immediately forthcoming, Australia would probably need to engage in holding operations against a presumably superior opponent.

An attritional strategy could be applied from the time opposing forces began to threaten Australia. Continuous small scale actions could both reduce the combat power of an adversary and create uncertainty in the minds of their commanders. The whole range of ADF capabilities would be expected to participate.

Strike and Interdiction

Conceptually, the simplest way to deny the use of the sea to an adversary is to attack their combat or support shipping at every opportunity. This can be done by striking at shipping or ports and bases, or by interdicting their forces as they attempt to use the sea.

Support for the Guadalcanal Campaign, 1942-43

A useful example of interdiction in the context of a contested sea environment is the sequence of encounters that Allied naval forces had with the Imperial Japanese Navy in the Guadalcanal campaign during 1942 - 43. Allied naval forces worked very hard, and often with limited effect, to prevent the reinforcement and sustainment of Japanese forces on the island for several months. Their early interdiction efforts were impeded by an inability to fight at night (including a failure to take full advantage of radar) and a lack of tactical flair that was the result of frequent command changes and an unsettled task organisation. Ultimate success resulted from the effective use of radar, improved night-fighting capability and better tactics, including much improved use of torpedoes.

Denying an adversary the use of the sea would be a fundamental element of defending against any significant land attack against Australia or its regional partners. Mounting strikes against the adversary's forces as they approached the coast would be a predictable yet necessary option for the ADF. In the first instance, the strikes would be conducted as close to an adversary's bases as possible; thus making submarines a preferred capability. Submarine strikes could then be mounted near chokepoints and as the threatening force approached potential landing sites.

Air strikes would be mounted from wherever they could be supported, from bases within Australia and beyond. They would become more concentrated as the adversary's forces neared their destination and would be supported by other ADF force elements, including surface combatants armed with anti-ship missiles.

Interdiction of an adversary's shipping would be carried out in response to any attempts to sustain their landing forces. Submarines would again be the preferred naval capability for interdiction. Surface combatants would also contribute to the interdiction task, operating when possible in conjunction with strike aircraft.

Implications for Force Development

There are very few contingencies in which sea denial alone would satisfy Australian maritime operational demands, and most often only as a component of sea control. By contrast there are many situations in which sea control needs to be obtained before sea denial operations can be mounted. It should be kept in mind that gaining even a working level of sea control may be difficult. Indeed, it may be impossible to achieve without support from allies or multinational partners.

For much of its existence the RAN force structure has reflected a line of thinking that has relied on a balanced force, one which has some capacity to undertake a broad range of naval or maritime operations. Given the difficulty of predicting future needs, the likelihood remains that the ADF will continue to take a balanced approach to maritime force development. A naval force structure biased too heavily towards sea denial would lack flexibility and be less well placed to conduct sea control operations.





10. EXERCISING SEA CONTROL: MARITIME TRADE PROTECTION

- Seaborne trade is vital for Australia's economic survival and prosperity.
- No individual or multinational maritime force will ever have sufficient resources to fully protect seaborne trade in the event of a conflict.
- Sustained protection of merchant ships and seaborne trade is difficult, so navies provide for cooperation and guidance in the event of threats.

Australia's security and economic well-being relies on exports of agricultural products, raw materials and energy. It also relies significantly on imports of energy and manufactured goods. Consequently, Australia can never take its maritime trade for granted and the effects of disruption should never be underestimated. Ensuring freedom of navigation and the integrity and stability of sea lines of communication (SLOC) therefore remain important functions of naval forces.

AUSTRALIA'S MARITIME TRADE

Most of Australia's population is located in the continent's south-eastern portion or is scattered in urban settlements, the majority of which are on, or near, the coast. Land transport links outside of these areas tend to be sparse and in many places underdeveloped. Although the nation's air transport links are excellent, they cannot be used to transport anything other than comparatively small, high-value cargoes. Not surprisingly, 99 per cent by weight and 76 per cent by value of all Australia's imports and exports are moved by sea (see Figures 10-1 & 10-2).

Australia's international trade is heavily focused towards Asia, with nearly two thirds of our exports passing through the South China Sea, although Europe and North America remain of vital interest. Our most important trading partners are China, Japan, the United States, the Republic of Korea, India, Singapore and New Zealand. Our most valuable export commodities are primary products, led by iron ore, coal, gold, heavy crude petroleum, liquefied natural gas (LNG) and wheat. Our most valuable import commodities are light crude petroleum, motor vehicles and refined petroleum products.

The Indian Ocean is also vital for Australia's trade with the trade and energy routes of many of our most important economic partners transiting this area. Half of the world's container traffic and one-third of the bulk cargo moves through the Indian Ocean and around forty percent of the world's offshore oil production comes from this region as well.

In common with most nations, Australia no longer maintains large stockpiles of raw materials or essential goods. Just-in-time ordering of motor vehicle spare parts, heavy duty vehicles, computers and telecommunications equipment means that few of these goods are held in bulk in Australia. Such inventories of manufactured goods generally contain no more than a two-week supply that may be reduced to as little as hours for components in the manufacturing industry. Consequently, Australia relies on continued assured access to imports, not only to construct new equipment but, perhaps more importantly, to keep current equipment operational.

The Australian Experience of Maritime Trade Protection

During World War I, German surface raiders conducted a *guerre de course* in the Indian and Pacific oceans. The economic effect and drain on naval resources required to counter them far outweighed each cruiser's individual fighting power. For example, the attacks by the German raider *Emden* caused a rise in insurance rates and commodity prices as well as keeping merchant ships in port. Moreover, more than a dozen Allied warships were diverted to search for the German cruiser before she was destroyed by the Australian cruiser HMAS *Sydney* at the Cocos Islands on 9 November 1914.

During World War II Japan conducted an extensive submarine campaign in Australia's waters with some success. More than 40 merchant ships were attacked off the east coast during 1942-43. Because of the threat, convoys were introduced and up to a third of the RAN's strength and a large number of aircraft were tasked with trade protection duties. A similar, but far more effective, interdiction campaign was mounted against Japanese shipping by the submarines of the US Navy's Pacific Fleet. Japan's failure to institute adequate protective measures until far too late in the war resulted in the loss of much of its merchant shipping. Its maritime trade was destroyed and its economy and war-making potential were effectively crippled.

The principal lesson from Australia's wartime experiences is that an adversary can cause more disruption, in terms of both resources that have to be reallocated to meet the threat and in economic damage, through making sporadic attacks on maritime trade than from the actual physical losses associated with those attacks.

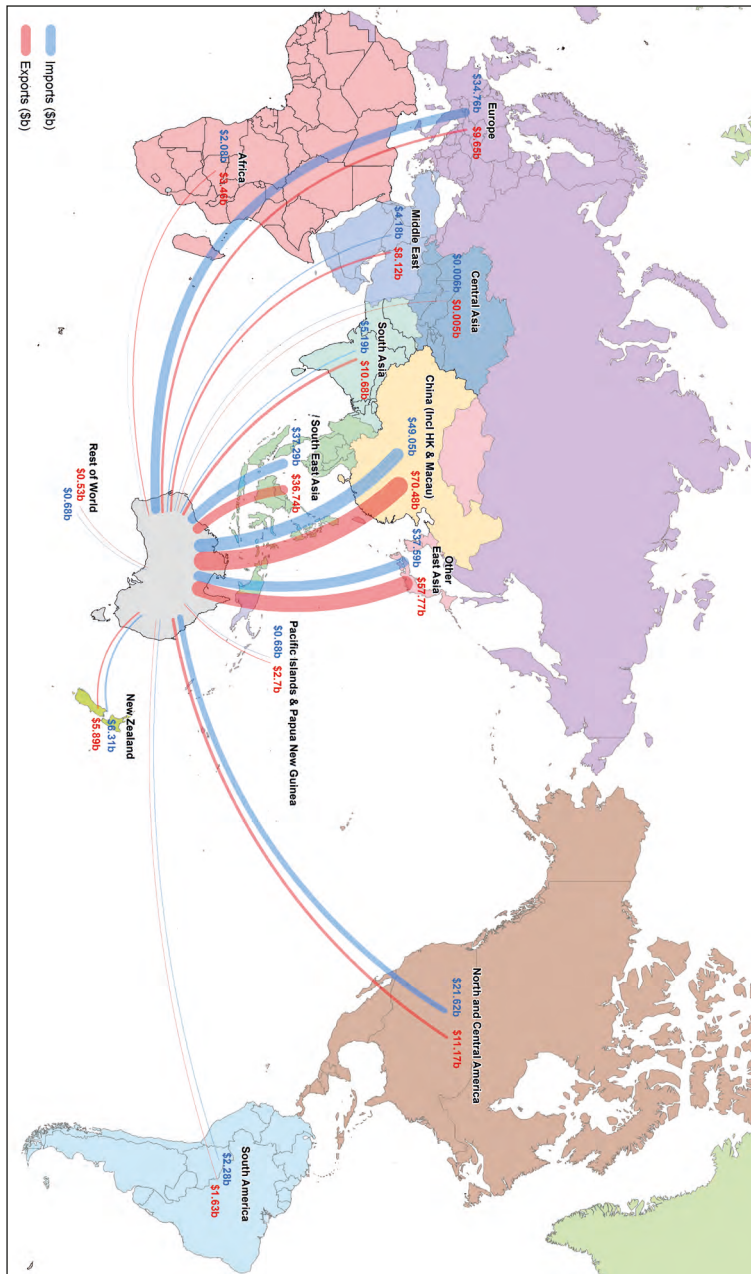


Figure 10-1: Value of Australia's International sea freight by trading region of final destination or origin, 2015-16 (\$b) (BITRE Statistical report Australian sea freight 2015-16)

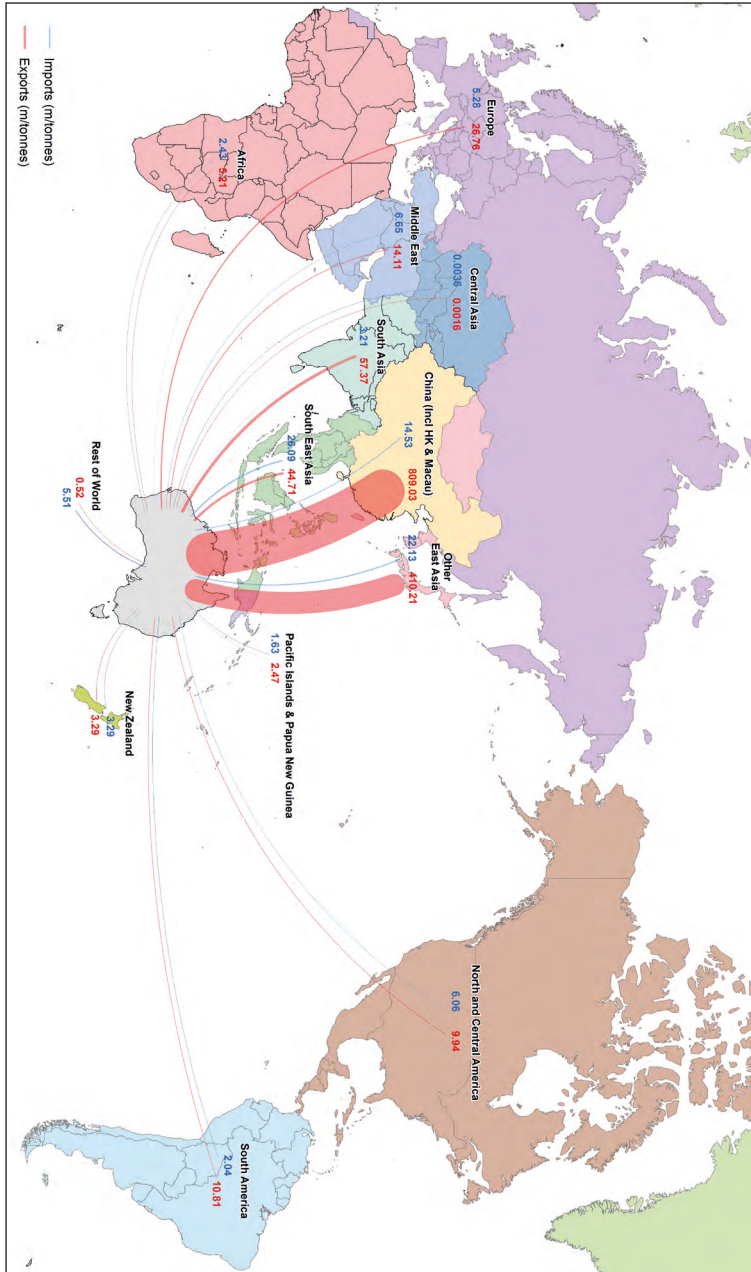


Figure 10-2: Weight of Australia's international sea freight by trading region of final destination or origin 2015-16 (\$b) (BTRE Statistical report Australian sea freight 2015-16)

Australia's energy requirements can only be met by the regular arrival of seaborne trade. Australia imports more than 90 per cent of its domestic crude oil requirements, with Malaysia, Indonesia and the United Arab Emirates among the biggest suppliers. This represents an increase from 60 per cent in 2000. About a quarter of refined petroleum products are imported, with almost two thirds of the total coming from Singapore. The high dependency on both crude oil for refinement and imported product ensures that ongoing supply is of paramount consideration in any contingency. Also the only viable means of distributing this product, in bulk, within Australia is by sea.

The Australian Trading Fleet

The majority of Australian trade is carried in foreign-flagged vessels because Australia no longer maintains a significant international trading fleet. Australia's major trading fleet (deadweight tonnage DWT) of 2000 tonnes or more) consists predominately of general cargo and bulk carriers. In 2015-16 it numbered less than 80 ships, of which 26 were Australian-registered and conducted international trade. The average age of vessels in the trading fleet was 15.3 years, down from 16.7 years in 2010-11.

Australian-flagged ships carry only a small proportion of the 1200 million tonnes of international sea freight carried to and from Australia each year. The potential security implications resulting from Australia's inability to control the shipping of other flag states should never be ignored. The decline of the Australian Shipping Register has also caused the reduction in Australian seafarers which has eroded the recruiting base for future personnel specialised in maritime trade operations.

THREATS TO MARITIME TRADE

In the existing strategic context, maritime piracy, terrorism and trans-national threats are the primary ongoing concerns to seaborne trade. These all have the potential to hinder, restrict or even close shipping routes, thus delaying or stopping the availability of commodities and imposing additional costs on consumers. In these circumstances, increased maritime insurance rates are likely to be of greater concern than the additional transportation costs involved in bypassing areas of concern.

Maritime Piracy

Maritime piracy can occur along trade routes or elsewhere in international waters. A practical description is 'the hijacking and theft of a vessel and cargo', and includes boardings to steal cargo and personal valuables, or the taking of a vessel for political or financial extortion. Piracy is differentiated from sea robbery, which involves those criminal incidents that occur in territorial waters.

Maritime Terrorism

Past acts of terrorism in the Indo-Pacific region and further afield have demonstrated the ability of terrorists to target the maritime industry. Terrorist organisations may attack merchant ships, ports and offshore infrastructure with a view to obtaining recognition or disrupting the target nation's economy and political stability. The terrorist attacks of 11 September 2001, although not directed against maritime facilities, initiated marked increases in maritime insurance policies as a consideration of continued operations, together with the introduction of the *International Ship and Port Security Code* as a risk mitigation measure. Australian-flagged shipping, private vessels, vital cargoes and citizens, whether at home or abroad, must always be considered at potential risk.

Terrorism in the maritime domain requires mariner skills, the ability to train for and sustain sea-based operations, and access to appropriate watercraft. These challenges encourage hostile groups to reduce difficulties and maximise the effect by focusing on areas of concentration such as harbours, straits and coastal shipping lanes (i.e. the attack on USS *Cole* at Aden in October 2000 and the MV *Limburg* off Yemen in 2002). The blocking of the Malacca Strait through a major sinking, for example, might not only impose significant delays on commercial shipping operations, but would also create more immediate publicity gains through location and shock than an equivalent incident on the high seas.

State-Based Threats

Threats from another nation may be on quite a different scale to those posed by pirates, criminals and terrorist organisations. Seaborne trade and shipping is particularly at risk during periods of tension, conflict and war.

Commercial shipping today remains absolutely fundamental to the global economy and transportation network but, in addition to the physical components, also includes the computer networks that regulate and support the flow of maritime trade. There are thus additional avenues for effective disruption, with potentially greater challenges for protection efforts. Other factors exacerbating the difficulties of providing effective maritime security relate directly to globalisation. These include:

- a reduction in traditional national flag shipping
- the growing reliance on just-in-time supply chains
- the greater number of merchant ships plying global trade routes relative to warship numbers
- the increasing size of merchant ships with the consequent potential for the loss of even one ship to be economically significant
- limited merchant crew numbers, the lack of standardised training and the potential for language difficulties.

Effects of Disruption of Maritime Trade on Australia

Global economies are interconnected and any interruption or interference with trade would have a rapid and detrimental effect on Australia's economy and the quality of life of its citizens. The size and seriousness of this effect would depend on the length and nature of the disruption. Australia's dependence on reliable oil supplies, for example, represents a critical vulnerability that any future adversary may seek to exploit.

Short-term or limited interruptions can occur in peacetime as a result of labour and political disputes or natural disasters. Tropical Cyclone Yasi, a significant weather event in 2011, closed all sea ports between Cairns and Mackay as well as the coal terminals at Abbot Point, Hay Point and Dalrymple Bay. The resultant disruptions in coal supply led to a surge in coal prices, while major flooding eventually closed the Port of Brisbane. In total, severe weather events across Queensland in 2010-11 resulted in the loss of 27 million tonnes of coal exports and around \$6 billion from gross state product. Australia's main ports are detailed at Figure 10-3.

Liquid Fuel Security Concerns

Since 2010 Australian domestic capacity has decreased from seven operating refineries to four, putting strain on the availability of specific military fuel types to support defence capability. This situation increases Australia's import dependency on refined petroleum products and crude oil to meet liquid fuel demands, despite the nation's standing as the world's ninth-largest energy producer.

In addition to a lack of fuel diversity, Australia maintains relatively small stockholdings, amounting to about three weeks worth of oil and refined fuels, and relies on a lengthy supply chain. The national dependency on crude and fuel imports for transport has grown to over 90 per cent from around 60 per cent in 2000. Under an International Energy Agency treaty, Australia is obliged to hold 90 days of oil stocks. Yet up to 30 percent of stock in the supply chain may actually be in transit. The Australian Government has recognised this shortfall and the need for a national Transport Energy Plan to achieve a secure, affordable and sustainable energy supply.

It is noteworthy that any significant interruption to Australia's trade would inevitably involve other countries and probably occur in concert with major regional events. Such disruption could result in an immediate reduction or cessation of activity at some of the nation's major ports; with an associated decline in economic activity in export- and import-dependent industries and local employment. In the medium to long-term the effect would be profound and felt nationwide through loss of reputation of reliability and stability, likely leading to higher import costs and a potential loss of export markets.

This would affect the nation's balance of payments, gross national product and levels of employment, causing other flow-on effects such as increased domestic costs and a commensurate drop in consumption. The Government would inevitably come under strong pressure to respond swiftly and decisively. It is vital that Australia both appreciates the nature of its maritime trade and maintains the capability to protect it.

DIFFICULTIES IN PROTECTING TRADE

Resources

The major limitation in trade protection operations always manifests itself through finite resources, not only in terms of maritime forces but also in terms of process administration. Australia's comparatively small and dispersed population and infrastructure generates unique security demands, specifically the possible need for simultaneous deployments to several geographically remote locations. The Defence budget and size of the ADF are quite limited in comparison with the extent of national territory and offshore jurisdiction. Ultimately, this means there is never enough resources to concurrently protect all shipping and all ports. In fact, Defence resources would be severely stretched in many circumstances far short of that demand. Every maritime nation faces a similar situation therefore efforts continue to build an international partnership of navies willing to participate in global maritime security.

Multinational Interests in Globalised Shipping

Few large merchant ships have an ownership structure limited to a single country. It is quite common for a ship to be owned by an entity in one country, be chartered by an entity in another and be registered in a third. Also, both cargo and ships can be on-sold while en route to their destination, with ships being regularly renamed and reflagged. Similarly, most merchant ships today are crewed by a multinational conglomeration of officers and crew. This multinational network of interests has the potential to make any necessary cooperation with navies more difficult. Likewise, virtually all modern merchant ships operate with minimum crews. This limits the nature and extent of tasks that can be conducted at sea beyond those associated with normal passage activities.

Flags of Convenience

Australia is not in a position to place all ships carrying its trade under naval control to protect them from maritime threats. As noted earlier, nearly all of Australia's maritime trade is carried in ships registered under a foreign registry or flag of convenience. International law requires that a genuine link must exist between the ship and the country (or flag state) where it is registered. Nevertheless, there remain flags of convenience, or open registry, states that encourage foreign ship owners to avoid applicable labour, safety and

environmental regulations in their own country, by offering the benefits of low taxation and reduced operating costs (often through lower crew wages and minimal ship maintenance). This complicates the protection of ships when such protection may be required or warranted.

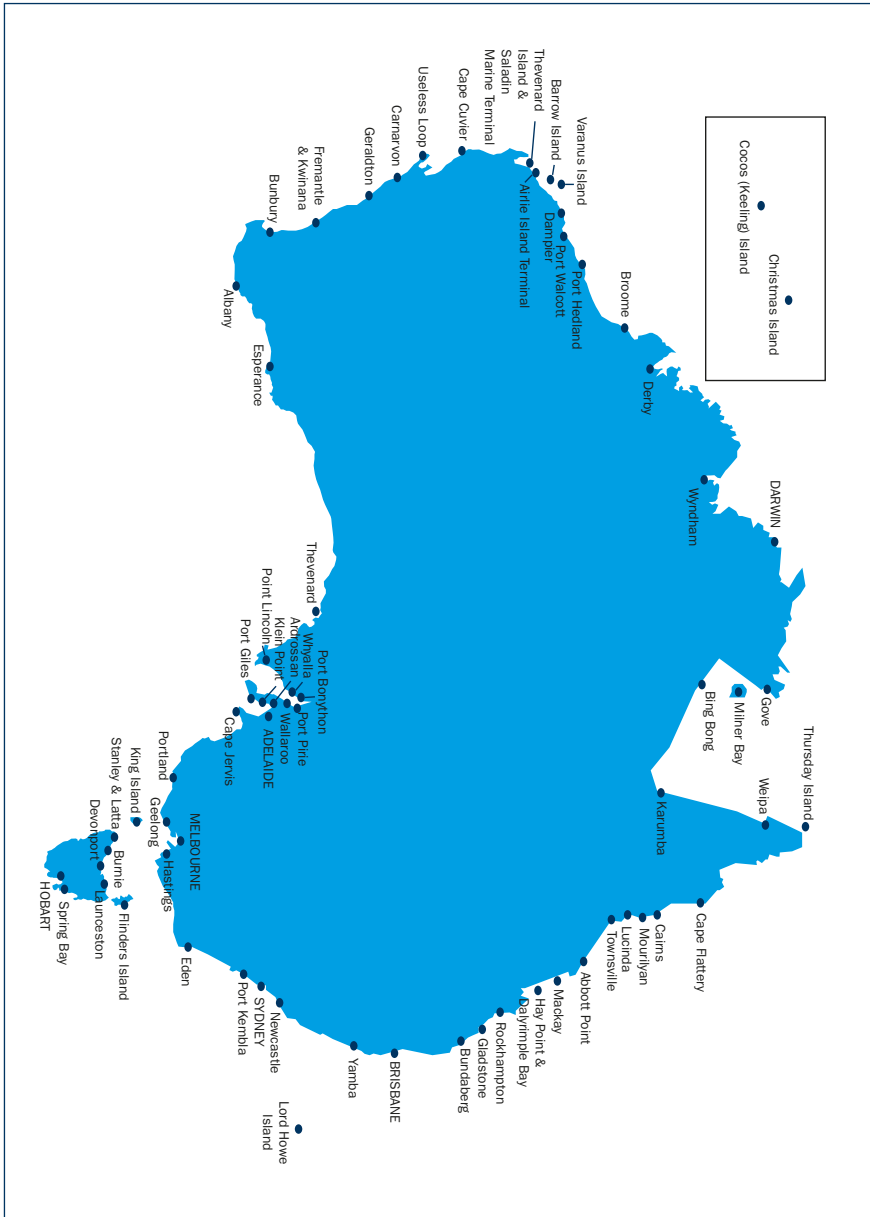


Figure 10-3: Australia's Major Ports

Merchant Ship Design

Broadly speaking, the cargo capacity of an average merchant ship today is equivalent to ten or more WWII-era ships. Modern cargo ships, capable of transiting the Panama Canal can range up to 80,000 DWT, be up to 275 metres in length and transit at up to 18 knots.

The growth in the average and maximum sizes of merchant vessels, particularly in their draft, necessitates a regular program of hydrographic surveys of shipping routes and chokepoints to address under-keel clearance issues. This may be due to either the inadequacy of previous surveys or, in areas like the Torres Strait, the mobile nature of the seabed. Another consequence of increased size is a corresponding increase in value. For example, a 250,000 DWT tanker can carry about two days worth of Australia's oil requirements. The removal of one such ship, for military or national purposes, may not only cause cargo congestion at the ports it serves, but also could bring trade and its enabling industry to a halt.

Furthermore, many ships today are built to carry specific cargoes on designated routes, using the fuel (known as bunkers) available on those routes. Thus, a ship may be designed to carry bulk ore on one leg, be in ballast (no cargo) on a second leg, carry another type of ore on a third leg, and have a short ballast leg back to the starting point. A ship's dimensions may be designed around the ports it will visit and it may also be equipped with engines designed to burn the fuel available at those ports. As most ships are also designed for long constant-speed voyages with slow accelerations and decelerations to and from operating speeds, they are not capable of the speed variations associated with warship and task group manoeuvres

Sea Lines of Communication and Maritime Chokepoints

Although convenient to refer to the geographic concepts of sea lines of communication and chokepoints, it is the ships and the cargo they carry, not the water they sail on, that can be vulnerable to attack and therefore must be protected. Merchant shipping to and from Australia follows set and largely commercially-driven routes. Australia's geographic location, its coastal population centres, and the arc of islands and coral reefs around much of the northern coast, ensure that most sea lanes cannot be altered and therefore ships may need to pass through one of half a dozen chokepoints around the coast. The RAN's hydrographic ships and aircraft have been instrumental in opening new routes and enhancing others, reducing both risk and voyage times. Additionally, charting of fairways and other routing measures is a primary contributor in separating shipping patterns from vulnerable offshore infrastructure such as oil rigs.

Australia's substantial trade with Asia is similarly geographically bound, and it routinely passes through at least one relatively constricted passage in South East Asian waters. This makes shipping vulnerable either by closure of the passage chokepoint or to attacks taking advantage of the funnelling effect they have on shipping. Chokepoints are important to many other countries in Asia and beyond and always attract attention in times of tension or conflict.

The advent of mega-ports, especially in Asia, has created another kind of chokepoint, as these ports are critical to the effective movement of seaborne trade. A future adversary's campaign could include action against both trade and mega-ports.

Economically Significant Ports

Although some types of cargo can be handled by most ports others, such as crude oil, require specialised equipment and handling. Generally speaking, the more specialised the cargo, the fewer the number of ports capable of handling it. The loss of a port that handles specialised trade could therefore also mean the loss to Australia of almost all its trade in these products and this may well be a factor in determining which ports are prioritised for protection.

Australia's most important ports by value and weight of goods transhipped are shown in Table 10-1. Most of these handle both export and import trade. In addition there are several vital offshore oil and Liquefied Natural Gas (LNG) exploration and production facilities located in the eastern approaches to Bass Strait, on the north-west shelf of Western Australia and in the Zone of Cooperation in the Timor Sea. These facilities are also isolated and could be vulnerable in certain situations.

	Export value (\$b)	Export weight (millions of tons)	Import value (\$b)	Import weight (millions of tons)
Dampier, WA	34.0	167.5	2.4	1.5
Port Hedland, WA	29.7	438.2	2.5	2.0
Melbourne, VIC	22.6	10.9	53.7	14.0
Newcastle, NSW	14.6	161.7	1.8	2.2
Hay Point, QLD	13.3	114.9	-	-
Brisbane, QLD	14.0	13.7	26.7	14.2
Fremantle, WA	11.0	18.4	18.8	13.6
Sydney, NSW	11.4	5.5	53.0	17.4
Gladstone, QLD	10.2	74.7	2.0	3.1
Adelaide, SA	7.8	5.9	6.0	3.5
Port Kembla, NSW	4.0	15.4	9.2	2.5
Geelong, VIC	0.6	2.2	4.8	7.7
Darwin, NT	5.4	5.5	5.0	6.9
Townsville, QLD	6.0	3.5	2.3	4.4
Port Walcott, WA	11.7	157.4	0.2	0.4
Abbot Point, QLD	2.8	28.7	-	-

Table 10-1: Seaborne trade through Australia's major ports, 2015-16 (BITRE Statistical report : Australian sea freight 2016-17)

Vital Cargoes

Some cargoes, such as oil, are considered vital, as are other essential cargoes if stockpiles are low. For example since 2010 Australian domestic fuel capacity has decreased from seven operating refineries to four, putting strain on the availability of specific fuel types to support industry and defence capability. Despite Australia being the world's ninth largest energy producer, the national dependence on crude and refined fuel imports for transport has grown to over 90% from around 60% in 2000

The importance of almost any cargo increases if its failure to arrive/ depart carries with it the very real possibility of serious, long-term economic consequences. Aluminium smelters, for example, are time-consuming and expensive to shut down and restart, but if a cargo of alumina does not arrive, there may be no choice but to close the smelter for a considerable time. Similarly, the failure of a tanker to arrive at a regional port may not only result in fuel disruptions, but also can delay activities such as crop harvesting so that the harvest is either significantly reduced in value or completely lost.

Legal Considerations

As specified in Safety of Life at Sea (SOLAS) legislation, the *Navigation Act 2012* and *Marine Orders*, the masters and operators of commercial vessels are legally required to use official nautical charts and publications. For Australian waters, these charts are currently produced and updated by the Australian Hydrographic Service (AHS). The Commonwealth is legally liable for errors and omissions from Australian nautical charts, as produced by the AHS on its behalf.

Masters, ship owners and those who charter merchant ships are usually not legally required to accept naval guidance or, even if threat levels are high, obliged to accept an escort or to form, or remain, in a convoy. Masters of merchant ships, however, will be more inclined to comply with naval guidance if they can be assured of an improved probability of safe passage and if their owners or charterers are convinced that a failure to comply will result in adverse economic consequences such as higher insurance rates or loss of markets.

The starting point for consideration, during any level of contingency, must be the relevant vessel's flag state. Jurisdiction over shipping on the high seas, when beyond the jurisdiction of a coastal state, is exclusive. In the ordinary course of events, a ship in waters beyond national jurisdiction is under the control of its flag state.

PROTECTING AUSTRALIA'S MARITIME TRADE

The task of protecting maritime shipping and trade remains a core ADF function. Not only is trade defence a whole of nation necessity, but without the free movement of commercial shipping, the ADF cannot effectively sustain its own operations.

There also exists a degree of mutual reliance between the ADF and the commercial arms of shipping and maritime trade. Navy, for example, will often rely on the ability to access safe and well protected harbours either to mount and/or support ongoing operations and exercises, or to undertake repairs, maintenance, logistic re-supply and crew respite. As was the case in Timor Leste in 1999-2001, the ADF may also require commercial vessel support to be able to more effectively conduct sustained operations. Conversely, commercial shipping will at times rely heavily on the protection afforded by a highly capable, flexible and well-trained Navy protecting vital trade links to and from Australia.

This convergence of activities highlights the need for maintaining effective relationships between the RAN and maritime industry. Such relationships serve to enhance naval awareness and operational decision-making, allowing commanders to act pre-emptively to de-conflict operations and better protect freedom of navigation.

The Australian Maritime Defence Council (AMDC) was established in 1982 as one of the fora in which senior Defence and industry stakeholders could exchange information on trends and matters of national maritime interest. The chair of the AMDC is the Deputy Chief of Navy and council members include shipping companies, the Australian Ship Repair Group, Maritime Border Command and the Maritime Union of Australia.

THE MARITIME TRADE OPERATIONS CAPABILITY

Most RAN officers are not trained to understand commercial shipping operations and maritime trade, nor do they maintain professional networks with the maritime industry. Accordingly specialist Maritime Trade Operations (MTO) officers provide the Navy with this industry link through a professional team of Reserve personnel, whose normal employment includes experience in the civil and commercial maritime sectors and who are familiar with port and merchant ship operations. MTO also includes ex-permanent naval warfare officers with operational and headquarters experience.

As a specialist team, MTO Team 1 (MTOT1) provides a civilian/military capability that supports the Navy mission and its role in protecting maritime trade. By strengthening relationships beyond Navy, particularly with those maritime industry areas that can help support military operations, MTOT1 forms a vital component of the RAN's war-fighting network.

Maritime Trade Protection in the Middle East Region

As part of the RAN's ongoing contribution to operations in the Middle East the MTOT1 deploys personnel to work with the United Kingdom Maritime Trade Operations (UKMTO) organisation, which conducts operations in an area covering the Red Sea, Persian Gulf, Gulf of Aden and Indian Ocean high-risk areas.

Australian personnel assist UKMTO and Coalition Maritime Forces to protect SLOCs and promote the freedom of maritime trade through regional choke points such as the Bab Al Mandeb and the Strait of Hormuz. The primary focus is counter-piracy and more general maritime security operations. The UKMTO is now the primary point of contact for international merchant vessels in case of threats, attacks or for liaison in order to de-conflict with Coalition maritime security operations.

As International Liaison Officers, MTO personnel provide the link between merchant ship masters, shipping company Chief Security Officers and naval forces. Briefings are conducted with masters in regional ports to alert them to any issues including current threats and recommended self-protection measures. These activities have contributed to a significant decline in piracy and maritime criminal activity in the region.

Command and Control

The Director General Maritime Operations (DGMAROPS) is responsible for maintaining an effective Australian MTO capability for the Fleet Commander. Support to military tasks in Australia and the coordination of external requests for MTOT1 support is undertaken through Maritime Operations by the Director MTOT1. MTOT1 officers do not become involved in the physical protection of merchant shipping, other than as part of a naval or joint operational staff, which is the responsibility of CJOPS acting through an assigned CJTF. MTOT1 officers facilitate such protection by acting as the interface between the Navy, the ADF and the shipping industry.

Operational Effects

MTO employ a process of graduated actions to deliver required effects. This may range from passive measures, undertaken and developed during peacetime to increase the effectiveness of military contingency planning, through to active measures that directly shape, influence or deliver a military effect during high complexity operations. In practical terms, this means that MTO will encompass research and analysis, communication, liaison, shaping activities, cooperation with maritime industry, de-confliction and commercial shipping routing.

One of a suite of tools employed by MTO is Naval Cooperation and Guidance for Shipping (NCAGS). NCAGS is a mechanism for guiding participating merchant vessels and coordinating naval assets to provide a common standard for interoperability and de-confliction. Although voluntary for shipping, if employed during high-end warfighting operations its implementation may affect the commercial aspects of the maritime industry and generate a sharp increase in insurance premiums.

Civil Military Cooperation and Engagement

MTO provide comprehensive capabilities that extend well beyond helping to protect shipping and maritime trade. Within NATO doctrine, civil military cooperation (CIMIC) and NCAGS are considered as separate but linked functions. However, this CIMIC and NCAGS distinction needs to be considered in the context of current and future ADF activities. The continuity and phasing of modern maritime operations does not warrant a separation between liaison, maritime domain awareness and the more direct engagement regimes resident within MTO.

The Joint Maritime Industry Support Team (JOMIST) is a principal component of CIMIC and engagement. This specialist element provides liaison officers to support special operations training using merchant and cruise ship resources. Sourcing these through JOMIST provides Defence with significant annual savings. Merchant shipping familiarisation training and situational understanding briefs can also be provided to ships' boarding teams and command teams respectively. Other CIMIC capabilities provided by MTOT1 during exercises and operations may include:

- briefs to merchant vessel masters on self-protective measures, risks and routing
- continuous communication and liaison with commercial shipping organisations and merchant vessels at sea
- Maritime Domain Awareness briefings and reassurance to shipping industry bodies and port authorities operating in exercise areas, areas of tension and conflict or other high-risk areas.

International Engagement

The global nature of the Blue Economy (the sum of all economic activity associated with the oceans, seas, harbours, ports and coastal zones) means that Australia requires foreign support and cooperation to monitor and protect its seaborne trade and commercial shipping. The Pacific and Indian Oceans Shipping Working Group (PACIOSWG) is a regional arrangement that seeks to advance the inter-operability of member and observer nations, third party merchant shipping and related stakeholders. Additionally, this group provides a forum for testing NCAGS doctrinal issues through exercising trade protection measures. Currently PACIOSWG involves Australia, Brazil, Canada, Chile, New Zealand, Singapore, South Africa, the Republic of Korea, the United Kingdom and the United States of America. Australia's long-term membership of the maritime trade protection community has developed into a position of regional stewardship. MTOT1 also maintains a close relationship with its New Zealand counterparts through exercises and a dedicated bilateral forum.

Operational Planning and Enabling Functions

The following enabling functions provide graduated MTOT1 action:

- **Establish and develop networks.** Communicate with industry to gain situational understanding and provide advice to military commanders
- **Provide MTO planning advice.** Research and analysis in support of the initial planning and scoping phases of joint operations; particularly those involving Australian SLOCs
- **Liaison with civilian authorities.** Communicate with industry to gain situational understanding and provide advice for coordination and protection of shipping. This also involves the support of industry to prioritise strategic sealift and military supply chains
- **Conduct information operations and broadcasts.** This is done to minimise the effect of threats on commercial shipping and reduce the need for enduring surveillance or escort operations
- **Develop and establish a maritime 'neighbourhood watch' type organisation.** Created in an area of operations by setting up a liaison and reporting service using fishers and mariners who understand the local pattern of life and can contribute to situational understanding and advice on vessels of interest
- **Establish a coast watching organisation.** Deployment of personnel ashore, in an operational area, to contribute to situational understanding and advice on maritime areas of interest, choke points and also vessels of interest
- **Provide positive identification of commercial shipping.** Used to determine the vessels use or intent. May involve the monitoring of vessels of interests

- **Direct support to establish a sea point of de-embarkation.** Normally done within an established port
- **Direct support to other government agencies to assist non-combatant evacuation operations.** Undertaken by managing the waterfront, port or wharf operations as distinct, and separate, from existing logistics support functions
- **Provide positive supervision of commercial, civilian and government shipping.** Conducted at anchorages or staging areas and involves managing the priorities for port entry and exit
- **Manage the MTO routing and diversion of shipping.** Set up to establish reporting schedules during operations
- **Establish a shipping coordination point.** Includes setting up shipping coordination teams, as required, that can be deployed to support operations
- **Provide liaison officers in merchant ships.** As required, but particularly during the conduct of escort operations
- **Provide liaison officers to manage escorted groups.** As required when a convoy system is established
- **Provide liaison officers in headquarters.** The placement of MTO advisors, to command especially in national or coalition headquarters
- **Establish and implement Naval Cooperation and Guidance for Shipping (NCAGS).** Establish NCAGS in accordance with the Defence operational enabler functions framework for operations, sea control and SLOC
- **Stabilisation.** Provide specialist advice on stabilisation and reconstruction operations necessary for the re-establishment of harbour and port infrastructure.

Future Issues in Maritime Trade Protection

The future operating environment will always require the protection of seaborne trade and shipping, in the face of potential threats from crime, terrorism and inter- and intra-state conflict. Natural disasters and unusual weather events can likewise disrupt seaborne trade through marine accidents and the destruction of infrastructure.

The role of Australia's commercial maritime and ship building industry in supporting the ADF is a major consideration for the future. Regional nations often see an alternative to the economic pressure of warship production through shipbuilders reserving some military application platforms within their commercial inventories. Some nations have already approved a set of technical guidelines for industry that will enable civilian ships to be converted into military vessels in an emergency. Future maritime operations may well require the mobilisation and deployment of a large number of civil vessels to provide sustainment. This is not a new concept and prior to WW II many nations, particularly the UK, built vessels that could be easily converted into naval vessels at short notice.

Australia's strategic outlook and operating environment warrants an approach similar to that of our regional neighbours. Thus the need for military liaison with industry will be on a far greater scale as the ADF manages a more complex and potentially volatile regional maritime picture.





11. SEA CONTROL OPERATIONS: MARITIME POWER PROJECTION

- The ADF must possess an expeditionary disposition at the operational level and retain the requisite power projection capabilities to enable the achievement of this orientation.
- Sea control enables the projection of power from the sea.
- Maritime power projection has applicability across the full spectrum of operations from humanitarian assistance and disaster relief through to regional and global conflict.

Sea control enables the projection of maritime power at sea and from the sea. General examples of maritime power projection operations include:

- the landing of amphibious forces and special forces to directly influence events on land
- the delivery ashore of seaborne land and air forces
- bombardment by guided or unguided weapons from ships or their embarked aircraft
- peace enforcement, involving the coercive use of military force to assist diplomacy in restoring peace to a nation or community, possibly without the consent of one of the contending parties
- peace making operations to secure a ceasefire or peaceful settlement, involving diplomatic action and the direct and/or indirect use of military force.

Maritime power projection operations can include peace-keeping efforts, but as these operations are generally conducted with the consent of previously contending parties, they will be dealt with separately. It should be noted that the dividing line between the less coercive forms of power projection and the coercive forms of naval diplomacy can often be indistinct and may even overlap.

Aims of Maritime Power Projection

Maritime power projection aims to:

- **Determine the outcome of conflict.** The sequence of campaigns across the Pacific theatre during WWII involved multiple operations to project maritime power ashore. These operations built one upon the other to eventually threaten Japan with invasion and also facilitated the strategic air campaign that ultimately confirmed Allied victory. Importantly, when considering such operations the role of naval forces continues until well after the landing of ground forces; through fire support and logistics sustainment.
- **Open new operational fronts.** Despite ultimately failing in its aim, the 1915 Gallipoli campaign during WWI is a useful example of maritime power projection. It was used to open a new and potentially more advantageous front for operations on the adversary's flank. WWII also saw several successful operations aimed at opening new fronts. These included Japanese operations in the Philippines and Southeast Asia in 1941-42 and Allied operations in the Mediterranean in 1942-44. The surprise landing by UN forces at Inchon, in Korea, in 1950 also provides another case study.
- **Contain adversary forces.** The actual, or potential, landing of forces from the sea can have a strategic effect out of all proportion to their size, through the containing influence that such an operation exerts. For example, during the 1990-91 Gulf War the US Amphibious Task Group threatened to land an amphibious force in Kuwait; this prevented Iraqi Army formations from being deployed elsewhere on the battlefield when required.
- **Seize or neutralise adversary bases and ports.** Nations have often sought to reduce the maritime power of an adversary by conducting attacks on their bases. The Japanese attack on the US Navy's fleet in port at Pearl Harbor in December 1941 is an excellent example.
- **Force an inferior adversary to fight.** Threatening an asset of such strategic importance that an adversary is bound to try to defend it can be an effective means of luring an otherwise reluctant enemy into an engagement. The Japanese invasion of Java in March 1942 forced inferior Allied naval forces to try and prevent troop landings, which resulted in heavy Allied naval losses.
- **Coerce an actual or potential adversary.** Bombardment from the sea and amphibious assault can be seen as forms of coercive naval diplomacy – a means of influencing the behaviour of people ashore. Examples include the US Navy's air attacks on Libya in 1986 and ADF amphibious operations in Timor-Leste in 2006.

Types of Maritime Power Projection Operations

Two of the most important maritime power projection operations are amphibious operations and shore bombardment. Each can be further sub-divided, with amphibious operations including:

- **Amphibious assault.** In these operations the aim is to land on a hostile or potentially hostile shore, build up combat power and possibly, by opening a new front, materially alter the course of the crisis or conflict.
- **Amphibious raid.** The aim of these operations is to conduct a swift incursion into, or temporary occupation of, an objective area followed by a planned withdrawal.
- **Amphibious withdrawal.** This involves the extraction of forces by sea in naval ships, or other craft, from a hostile or potentially hostile shore. A successful withdrawal can pave the way for re-insertion of a landing force at another point; thus exploiting the strategic mobility offered by having local control of the sea.
- **Amphibious demonstration.** An amphibious operation conducted for the purpose of deceiving the adversary by using a show of force. The aim is to delude the adversary into an unfavourable course of action – such as preventing some of their forces from being redeployed to their advantage.
- **Amphibious support to other operations.** Amphibious forces have a significant ability to conduct other operations. These could include, for example, humanitarian and disaster relief or stabilisation operations.

Power Projection – Sierra Leone, 2000

By May 2000, the long running civil war in Sierra Leone had reached a point where the United Kingdom recognised a need to conduct a non-combatant evacuation operation of entitled personnel using an airborne task force. Once this was conducted operations then shifted to stabilising the situation around the capital of Freetown and assisting the UN Assistance Mission to Sierra Leone (UNAMSIL). As part of the overall plan for operations the Royal Navy's aircraft carrier HMS *Illustrious* and the amphibious ready group centred on HMS *Ocean*, with 42 Commando embarked, arrived off the coast of Sierra Leone in mid-May. Over the ensuing month British forces, projecting power from the sea, were able to stabilise the situation to allow UNAMSIL to continue reorganising defensive positions and training the militias loyal to the Sierra Leone Government. The carrier and amphibious ready group returned to the United Kingdom in late June 2000.

Shore bombardment is part of naval surface fire support that consists of naval gunfire support and land strike. Both seek to significantly affect events at the operational or tactical level:

- **Naval gunfire support.** Prior to, during and after opposed landings surface combatants can provide fire support for ground forces. There has been some development of extended range munitions that may in the future see such support provided not only against an adversary in direct contact with the landing forces, but also against their supporting formations, at long range and with greater accuracy.
- **Land strike.** Naval gunfire support is primarily tactical in its application, but attacks can also be mounted from the sea for operational or strategic effect. The advent of land-attack cruise missiles (LACM), including Tomahawk and Harpoon, has enabled naval forces to conduct accurate long-range attacks against strategically important land targets.

Prerequisites for Maritime Power Projection Operations

Maritime power projection operations can be complex and demand careful consideration before any forces are committed. Some of the planning factors associated with amphibious operations are:

- **Sea Control.** A prerequisite for amphibious operations is the establishment of adequate and effective control in the approaches to, and in the coastal waters off, a proposed landing area. Depending on the nature and scale of the operation, naval and air units might have to counter diverse threats from the air, land and sea as they approach. The landing force should be protected from all of these threats by a covering naval force, while also being directly supported to counter local and lesser threats as it enters the landing zone.
- Once the landing force is established ashore it is the task of the supporting naval force to provide ongoing protection, logistics and fire support to the ground force. Depending on circumstances the naval force may also have to conduct and cover any withdrawal of the landing force.
- **Specialist skills and training.** Substantial preparation and maintenance of skill levels are needed for the conduct of amphibious operations. There are many issues to consider including; logistics support, sufficient sealift and amphibious shipping, fire support, comprehensive local environmental knowledge (including weather, topographic, hydrographic and oceanographic information) and a capability analysis of all anticipated threats.
- **Effective integration.** Amphibious landings are joint operations. Although material factors are vital, operational success depends on less tangible matters such as the level of mutual understanding among participating services.

- **Surprise and manoeuvre.** Surprise and the speed of manoeuvre, at the operational and tactical level, are important because of the dangers posed to a landing force by a prepared adversary. The value of being able to project ground forces into areas unexpected by the adversary cannot be overstated. In the modern era surprise (i.e. the presence or sailing of an amphibious force) is difficult to achieve and it's often more effective as an overt, coercive effect. Tactical surprise (the time and place of a landing) is easier to achieve as a force can potentially threaten a coastline over 500 nm in a 24 hour period. Defending against this presents an adversary with a significant dilemma. The Normandy landings on 6 June 1944 demonstrated the difficulty of gaining all the intelligence necessary about potential landing areas before an operation. Although at four of the five beaches the landings proceeded with relatively light resistance this was not the case at Omaha Beach.
- **Compensatory military-technological advantages.** Defenders have natural advantages over assault forces because they can establish comprehensive defence- in-depth. Compensatory measures involving innovative use of technology have been developed to reduce any imbalances. Sea-based air power has proven to be most useful, but is available only to a few navies. Consequently, whenever possible land-based air power is needed to support amphibious operations.
- **Land-strike operations.** Although they still require much planning, land-strike does not require a high level of inter-service cooperation and coordination which is implicit in amphibious operations. Possession of a credible sea-based land-attack capability is founded on several principles:
 - **Comprehensive and accurate targeting data.** Land Attack Cruise Missiles that incorporate self-navigation systems must have target positions programmed before launch. Therefore strategically significant targets need to be identified early, and target identification must be sufficiently accurate to ensure a high probability of significant damage.
 - **Sufficient accurate weapons to achieve a strategic effect.** The nature of specific targets determines how they might best be attacked. For example attacks on point targets, such as adversary command and control nodes, may generate greater effects than attacks on area targets, such as air or naval bases.
 - **Political will.** Deploying a maritime force capable of projecting power ashore through land attack demonstrates political resolve, but without establishing any specific commitment to an attack. A force is able to remain at sea for a protracted period representing a capability, and intent, to attack if necessary.

THE AUSTRALIAN APPROACH TO MARITIME POWER PROJECTION OPERATIONS

Amphibious Operations

The extent and nature of the operational environment means that the ADF must possess the ability for maritime power projection. Land forces are an essential element of this expeditionary capability, securing offshore territories and facilities, defeating incursions into Australian territory, protecting military bases and, potentially, denying an adversary access to staging bases. A balanced force structure must ensure the ADF has capacity for maritime manoeuvre and the ongoing sustainment of land forces ashore. This ability provides Government with a cost-effective means of shaping and influencing the operational area.

The ADF must be able to respond to contingencies by:

- acting independently in support of unique strategic interests, where we would not wish to be reliant on any other power
- leading multinational operations in which we have a shared interest and in which ADF leadership would partly compensate for the limited capacity of others to contribute
- providing meaningful contributions to multinational operations in which we share wider global or strategic interests.

An expeditionary orientation comes from the development of very real and habitual joint force integration, incorporating the maintenance of complex skills and procedures. The aim is to bring together command and control, medical, aviation and amphibious force elements and deploy them rapidly into areas of uncertain security without relying on existing infrastructure ashore.

Furthermore, the ADF's amphibious capability must be able to contribute to whole-of-government taskings, using the joint interagency task force concept. Forces must be rapidly deployable, flexible and interoperable, and be capable of undertaking operations sequentially or simultaneously as part of a complex campaign. Overall they must be networked effectively at all levels, trained collectively, and maintain close doctrinal ties and personnel integration.

An ADF amphibious task force must be able to create a secure area in which either military or other governmental agencies can carry out their assigned tasks, at the same time it must remain interoperable with allies and multinational partners. This level of interoperability requires compatibility in equipment, doctrine and amphibious operational concepts. It extends also to the employment of special forces, which may be supported by amphibious forces in various operations. Successful amphibious operations demand regular training and exposure to realistic scenarios with appropriate force elements involved.

CORE AUSTRALIAN AMPHIBIOUS CONCEPTS

Although the ADF must be prepared to conduct the range of amphibious operations there are some related concepts that are specifically applicable to the ADF.

Littoral Manoeuvre

Australia's nearer region is overwhelmingly maritime in nature, comprising a series of archipelagos, islands and semi-enclosed seas, together with a population that primarily lives close to the coast. Amphibious littoral manoeuvre is therefore both feasible and necessary. Australia's possession of an effective amphibious warfare capability provides operational mobility, inherent self-protection for a landing force and requires an adversary to consider the risk along their entire coastline. Littoral manoeuvre enables the ADF to use the regional maritime domain to achieve a disproportionate effect by projecting a scalable, flexible and agile force from over the horizon directly to an objective on the land.

Ship-to-Objective Manoeuvre

Ship-to-objective manoeuvre (STOM) is the projection of a combined arms landing forces by landing craft and/or aircraft directly to the operational objective. This freedom of manoeuvre creates surprise, control of tempo and discrimination in the application of force. Most significantly, STOM allows operations to continue without the traditional pause associated with establishing and consolidating a beachhead.

Embarked aviation provides for the quick and flexible insertion/extraction of forces, while landing craft can insert and extract the heavier elements of a landing force. This approach to amphibious operations complements the Australian Army's view that operations in complex terrain demand relatively large numbers of small combined arms teams. The ADF aims to be able to insert multiple combat teams by the use of concurrent air and landing craft sorties.

Distributed Manoeuvre

Distributed manoeuvre refers to discrete tactical activities in separate, possibly non-contiguous locations, throughout the amphibious objective area. It enables simultaneous synchronised actions, but places a greater demand on command and control, fire support, tactical mobility and sustainment. Where an initial landing force can be delivered from over the horizon, greater surprise can be achieved and circumstances generated in which a follow on force can be landed safely from closer inshore. The closer operations are to the shore enables the more rapid turn around of aircraft and watercraft for follow-on and sustainment activities.

Sea Basing

Sea basing is a concept that provides flexible and responsive amphibious support through taking advantage of the sea. The ADF concept has three elements: command and control, joint fires and logistics. It is intrinsically linked to ship-to-objective and distributed manoeuvre. The intent of sea basing is to protect key assets and to reduce, if not eliminate, the operational pause normally associated with building up combat power ashore before the beginning of breakout operations. Sea basing achieves this by limiting exposure of command and control and logistics assets to land based threats. It also enables embarked aircraft and landing craft to concentrate on the transfer ashore of combat force elements. The *Canberra*-class amphibious ships can provide a platform for limited sea basing.

Land-Strike Operations

When provided with a LACM capability, surface combatants and submarines offer the ADF additional flexibility in the conduct of long-range precision strike against hardened, defended and difficult to access targets. However, the limited size of a strike force, and availability of these weapons, means that sustained overwhelming combat power may not be available in many situations and reliance is placed on precision strikes.

Maritime-based Land Attack Considerations

There are several operational matters requiring careful evaluation in introducing and employing a maritime-based land-attack capability. These are:

- a significant geo-spatial analysis effort is needed for attack planning and target analysis
- the employment of surface combatants and submarines as LACM platforms requires careful consideration. There is almost certain to be conflict between planned tasking and availability of assets. The tasking flexibility of surface combatants, in particular, may result in conflicting employment that might in some cases affect or preclude their availability for strike operations
- that while surface combatants and submarines carry heavy, but restricted weapons loads, judgment is required to balance the number of specific weapon types carried vice weapon availability
- strike planning and target selection is an important skill that includes command and control, target selection, strike timing and identification of the striking units
- effective command and control for strike operations is critical in achieving desired strategic effects.

FUTURE CONSIDERATIONS

The future means and methods by which landing forces are moved from ship to objective must aim to reduce vulnerability while in transit. In some circumstances, this may involve moving substantial initial force elements by air, but there are circumstances in which conventional landing craft can still provide adequate and safe transport.

Amphibious assault in the face of sophisticated threats requires comprehensive air defence; including airborne early warning and control, surface-to-air missiles and tactical fighter aircraft. An inability to provide any one element of air defence will seriously compromise these operations. Ongoing unmanned aerial systems developments can facilitate the provision of some elements of air defence, if they can be embarked in amphibious or other ships.

Remotely operated surface and underwater vehicles may also provide benefit to expeditionary operations. They can enable mine warfare and other aspects of undersea warfare to be conducted from amphibious vessels independent of the presence of dedicated mine warfare and undersea warfare craft. This provides flexibility and defence to an expeditionary force, but requires space for these systems to be carried onboard which might otherwise be used for landing forces.

Naval surface fire support remains an important maritime capability and this is unlikely to change in the future. Long-range guided projectiles, including laser-guided munitions, significantly enhance the capacity of the surface combatants to support ground forces, but this will also demand a greater volume and duration of fire which may influence the ammunition holding capacity of future surface combatants. There is also scope for land attack cruise missiles to play a greater role in future maritime power projection operations.



12. SEA CONTROL OPERATIONS: LITTORAL OPERATIONS

- Littoral operations are those influenced by the interface between the land and the sea. These can encompass the entire spectrum of operations.
- There has been a resurgence in thinking and concepts relating to littoral operations, often driven by the outbreak of small scale regional conflicts and the requirement to provide humanitarian assistance and disaster relief.
- All naval capabilities are enablers for littoral operations.

Much of the history and analysis of maritime operations either deals with or assumes open ocean operations. There is, however, an aspect of both sea denial and sea control operations that is not confined to blue water and, because of the unique demands it places on maritime forces, needs to be considered separately. The term now in general use for those maritime operations mounted closer to the shore is littoral operations.

The littoral is defined as the areas to seaward of the coast which are susceptible to influence or support from the land and the areas inland from the coast which are susceptible to influence or support from the sea. This definition draws attention to the central issue that characterises littoral operations. The operational environment is determined by the proximity of land and, in most cases, by the presence and effects created by shallow water, both of which may make maritime operations significantly more difficult.

Littoral operations encompass a broad range of maritime tasks and roles, including:

- forward presence
- crisis response
- expeditionary operations and the introduction of land forces
- humanitarian assistance and disaster relief
- constabulary operations (see Chapter 13)
- diplomatic operations such as evacuations (see Chapter 14)
- counter-terrorism and counter piracy
- peace making, peace keeping and stabilisation operations.

Why Littoral Operations Are Difficult

Open ocean operations have an element of predictability associated with sensor performance. Deep water generally provides longer and more predictable sonar ranges than shallow water. Radar performance in the open ocean is also not reduced by detection shadows or weather patterns associated with land masses.

By contrast, the presence of shallow water and an uneven sea bed can cause dramatic variations in sonar performance. So too, the increased presence of shipping concentrations and marine life creates additional noise that can significantly affect sonar detection ranges. The result is that ASW is more difficult and complex. Although an adversary's submarine operations will also be affected to some extent, submarines operating in littoral waters generally have better knowledge of the water conditions than that of surface, or air, units and they can vary their depth to take advantage of these conditions. The presence of land masses interferes with radar propagation by creating blind spots, or shadows, that can be exploited by an adversary. Littoral operations are made even more complex by the capacity for threats to emerge, such as air or missile attacks, with little warning from over the land.

Another potential threat associated with shallow waters is that of mining. Mines can be used protectively in support of friendly shipping or offensively against an adversary. Mines known, or suspected, to have been laid in chokepoints or in focal areas can deny free access and may lead to lengthy and costly MCM operations.

Burma Campaign, 1945

The only access from the sea to the hinterland was through tidal creeks and inlets which weaved through a vast mazey pattern of mangrove swamps, mud banks, and tiny islands ... where the sea and the jungle mingled almost indistinguishably, indeed much of that tidal wilderness was marked on Army maps as 'water' and on Admiralty charts as 'land'.

John Winton,

The Forgotten Fleet: The British Navy in the Pacific, 1944-1945

Enabling Littoral Operations

Depending on the nature of the operation, successful littoral operations require significant supporting activity. In the simplest case of HADR operations, generally conducted in an unknown but benign threat environment, hydrographic survey work is needed to ensure the safe operation of shipping in waters that may be obstructed by debris, wrecks and shifting sub-surface topography. For opposed amphibious operations more comprehensive preparations are necessary and include:

- analysis of historical foundation data of the area
- rapid environmental assessment (REA)
- hydrographic survey
- meteorological and oceanographic reconnaissance
- ground and electronic reconnaissance
- MCM
- clearance diving.

Remote sensing can be used to update foundation data and special forces activities help prepare for a landing and subsequent operations ashore.

The complexity of amphibious operations demands specific command and control as well as planning and preparation. Consequently, there must be a comprehensive and capable communications network connecting the Commander Amphibious Task Force, the Commander of the Landing Force and any supporting task groups, (i.e. the MCM Task Group). Similarly, comprehensive intelligence support and diverse communications is needed by all participating forces.

HYDROGRAPHIC AND MCM SUPPORT OPERATIONS

Rapid Environmental Assessment

All forms of warfare benefit from a knowledge and understanding of the physical and environmental characteristics of the operational environment. This provides an essential foundation upon which friendly forces can be deployed, but provides an equally valuable insight into the options and constraints presented to an adversary. This is particularly true at sea, where the absence of certain environmental data, such as detailed bathymetric data or nautical charts, can prevent or delay operations.

Littoral operations are no different in this regard and knowledge of the operational environment is built up through REA. The maritime component of the initial REA is provided by specialist officers using existing data and modelling based on hydrographic, meteorological, oceanographic and mine warfare databases, along with remotely sensed data from other agencies such as the Australian Imagery and Geospatial Organisation. This information is then built upon by different parts of the ADF, particularly by Deployable Geospatial Support Teams (DGSTs), mobile metrological teams and MCM teams. This all contributes to greater situational understanding of the operational environment.

Examples of environmental information that is important in the maritime domain are:

- bathymetry (the sea bottom topography)
- tides and tidal stream analysis
- acoustic imagery of the sea floor, including wrecks and obstructions
- knowledge of the sea bottom types in the area of operations (i.e. sand, mud, rock, coral, etc)
- geo-acoustic parameters
- climatology
- water turbidity
- salinity, temperature and conductivity measurements
- wave, current and weather forecasts
- surf conditions
- beach zone forecasts (i.e. surf lines, breaker type, rips)
- beach gradient
- growth patterns on coral reefs
- possible changes in the event of flooding, tsunamis and earthquakes.

This spread of information comprises static and dynamic elements. Static data includes climatology, topography and bathymetry, which change slowly over weeks or years. Dynamic data includes meteorology and oceanography, which can change within hours. Although static data can be collected before an operation, there must be constant updates to dynamic data.

There are close links between REA and MCM in littoral operations, including compatibility of autonomous sensors used by both warfare disciplines and the demands for environmental data.

Humanitarian Assistance and Disaster Relief Operations

A secondary role of the RAN's hydrographic ships and associated DGSTs is to provide support in contingencies such as humanitarian assistance and disaster relief operations, search and rescue, and emergency medical and casualty assistance. The hydrographic support provided during HADR operations normally takes the form of surveys after major natural or man-made disasters. These surveys are needed to support humanitarian relief efforts and are conducted to ensure safety and security for shipping operations.

Circumstances may require that the DGSTs are flown at short notice to the area of operations and perform work with air portable equipment in a craft of opportunity (i.e. any readily available vessel). DGSTs conducted such survey operations following the 2004 Boxing Day tsunami. During this and other similar operations the DGSTs were embarked in and supported by non- hydrographic ships.

There are currently four DGSTs, each comprising four personnel and they are located in the hydrographic vessels *Leeuwin* and *Melville*, and establishments (*Waterhen* and *Cairns*). The nature of their secondary employment ensures flexibility and they are capable of operating with as little as 24 hours notice. Preferably, craft of opportunity will be fitted out with the requisite surveying equipment before deployment. These operations also require access to high-bandwidth secure communications.

Support for Amphibious Operations

Support for amphibious operations can be broken down into five phases, each with its own specific demands, with activities building upon an initial planning phase and initiation of REA:

- **Pre-arrival Operations.** Prior to the maritime advance force and amphibious task group arriving in an area of operations, initial REA, supported by remote sensed geospatial intelligence and environmental modelling, should have identified possible landing zones. These need to be confirmed by in-situ REA. Equally important, many potential landing zones may have been deemed as unsuitable.
- **Pre-landing Operations.** These operations involve general reconnaissance of the area of operations to determine suitable landing zones, the likely form and strength of opposition, and preferred approaches. They include hydrographic surveys to ensure safe navigation for the parent ships and smaller landing craft, as well as mine and obstacle clearance. Due to the specific skills required, these activities are best carried out by hydrographic surveyors and clearance diving teams. Pre-landing operations require the identification and marking of approach lanes, using all available navigation aids.

- **Beach Obstacle and Exit Patrols.** As part of any beach reconnaissance, pre-landing forces look for anti-landing obstacles, barriers and evidence of mining. They seek to identify potential routes from a beach into the hinterland. These patrols may need to be undertaken by day and by night. The main aim is to enable a seamless transit from the cleared approach lanes to the beach and then on to the beach exit into the hinterland. Clearance divers are ideal for this task as they are able to apply a consistent approach to the entire task.
- **Landing Operations.** Amphibious operations can be assisted by deception operations before and during the landings. Offensive operations involving sabotage of enemy ports, shipping and/or offshore facilities may also be undertaken before any landing, as part of deception operations.
- **Post-landing Operations.** These activities can involve the repositioning of MCM vessels and other units for additional work in the same area of operations. Their tasks may include clearing more approach routes and access lanes, as well as improving mine and obstacle clearance confidence levels. The substantial coordination efforts required in the lead up to, and in the aftermath of, landing operations provide a mutual interference danger between participating units. Inadvertent mine actuation is one of the possible issues.

Maritime Advance Force Operations

Maritime advance force operations are normally conducted prior to the establishment of an amphibious objective area. MCM, collection of beach intelligence and hydrographic reconnaissance surveys may all be required. These missions are normally clandestine and may be conducted by forces not integral to the amphibious task force.

MCM capability is vital in most amphibious operations, especially given the ease with which mines can be laid in shallow waters and the relative lack of sophistication needed to pursue mining operations. Furthermore the presence, or presumed presence, of mines can interfere significantly with amphibious landings, to the extent of causing them to be relocated to less desirable landing places, delayed or even cancelled.

There is a broad range of MCM forces which the ADF could use to assist amphibious landings. They include coastal mine-hunters (MHC), clearance diving teams, minesweeping drone boats, remotely operated surface and undersea vehicles and, depending on the nature of the operation, multinational MCM forces.

Clearance divers are preferred for mine warfare related advance force operations. Special forces may also operate clandestinely to conduct: special recovery, special reconnaissance, offensive and support operations. They can be inserted and extracted by submarine and their activities can be separated into six phases:

- **embarkation**, including stowage and preparation of equipment
- **transit to the area of operations**, which is normally submerged
- **insertion, submerged or surfaced**, depending on the tactical situation
- **extraction**, which can also be accomplished on the surface or submerged
- **transit** from the area of operations
- **disembarkation**.

Minesweeping drone boats may be used for remotely controlled influence minesweeping. Their utility is limited by their capacity to be deployed from ships and their navigation requirements. One specific use of these assets is for last minute sweeps ahead of a landing force.

Currently the RAN operates the Double Eagle remotely operated underwater vehicle that, among other tasks, is capable of placing an explosive charge on a mine using an extendable arm. More advanced systems that can conduct clandestine autonomous MCM tasks using sonars and other sensors may be procured in the future. Limitations in the RAN's mine warfare capabilities may nevertheless require the assistance of multinational partners or allies. The US Navy, for example, possesses some innovative MCM capacity including minesweeping helicopters and marine mammals capable of a high probability of detection.

Independent Mining Operations

Sea mines remain relatively inexpensive weapons that can be deployed without the need for sophisticated supporting organisations, yet mines can inflict critical damage on very large commercial and naval ships. Even a small number of mines laid (or claimed to have been laid) can deny access to a specific port or route.

Mining operations may be either offensive or defensive and can include:

- minefields in areas controlled by an adversary, to seal a chokepoint or port
- minefields in international waters to disrupt sea lines of communication
- minefields in one's own waters to restrict access to an adversary and thereby permit safe passage by friendly shipping.

Tactical mining operations include the laying of minefields for a specific operation, which might be an amphibious landing or the planned transit of high value shipping.

As well as providing support for amphibious operations, mine warfare forces may be needed to ensure Australian ports, and their approaches, are kept free from mines and thus retain capacity to keep a certain minimum number of ports cleared.

Several legal conventions govern the conduct of mining operations, including the Hague (1907) and Geneva (1958) conventions and UNCLOS. These include provisions relating to the requirement to demonstrate the need for: self-defence, to declare minefields before they are armed, to be able to clear mines that are laid and to avoid mining in international waters.

The method selected for laying mines is determined primarily by the nature of the minefield. Offensive mine-laying, in waters controlled by an adversary, may need to be conducted covertly. Submarines have the advantages of stealth and evasion in such cases but can carry only a limited load of sea mines. Other potential mine-laying platforms, such as aircraft and surface vessels, have their own limitations, including payload, observability and possible lack of defensive capacity.

Operational Planning Considerations for Minefields

The following factors are to be considered when planning for mine-laying operations:

- **Environment.** Water conditions, including depth and movement as well as seabed conditions, influence where minefields can be laid
- **Adversary MCM capability.** Mine types and numbers are determined by the capability of an adversary to hunt and sweep the kinds of mines used against them
- **Minefield as the weapon.** It is the entire minefield, not just the individual mines, that represent the weapon
- **Ship-count.** The use of ship-count systems in mines reduces their susceptibility to minesweeping, but not necessarily to detection by mine-hunters
- **Arming delays.** Arming delays can add to the unpredictability of mines in a field, but may be countered by mine-hunters
- **Types of influence mines.** The use of influence mines complicates sweeping operations but may be countered successfully by mine-hunters
- **Intended targets.** Mine types are selected according to the targets they are designed to damage/destroy, which in turn is a matter of target priority
- **Spacing.** The spacing of sea mines is determined by the mine type and the manoeuvrability of the mine-laying platform
- **Mine-laying platform.** Platform selection determines the number of mines laid and the accuracy of the minefield

- **Reliability.** Mine reliability is a significant factor in the ultimate success of the minefield and depends on their complexity, the care taken in preparation and handling as well as any effect imparted by the laying operation.
- **Position accuracy.** Mines, especially in defensive or protective fields, must be accurately laid and charted to enable safe passage of own forces and to facilitate eventual clearance.
- **Effectiveness.** To remain effective, minefields must be checked and if necessary refreshed or re-laid at regular intervals.

Independent Mine Countermeasures Operations

Although Australia does not presently have a mining capability the ADF must be prepared to deal with mine laying by an adversary, as any minefield, no matter how small, may pose a serious threat. An actual or suspected sea mine threat demands that the affected area either be cleared or closed to shipping.

There are two main categories of sea mines; moored mines, which are normally laid in water depths of less than 300 metres; and ground mines which rest on the bottom in depths of only a few metres down to 300 metres depending on the target (for example some mines maybe laid in the surf zone to target landing craft). Sea mines can be further classified by means of actuation, which include pressure, acoustic and magnetic actuation.

Successful MCM operations will demand specific information including:

- types, numbers and characteristics of potential minefields
- capabilities and tactics of adversary mine-laying forces
- sea bottom type (i.e. sand, mud, rock, coral) and sonar conditions
- intended target types
- expected duration of the minefields.

Intelligence is a key supporting activity. This may involve route surveys (which can provide seabed and water column environmental data) and conducting beach surveillance and reconnaissance. It may also involve recovery of an adversary's sea mines for analysis.

The two key approaches to MCM operations are offensive and defensive, with the latter also divisible into passive and active operations. Offensive MCM aims to prevent an adversary from laying mines and can involve:

- strategic strike against infrastructure by aircraft or special forces
- maritime strike by ships or aircraft against adversary air, surface or sub-surface mine-laying forces en route to the mine laying area
- laying strategic or tactical minefields.

Passive Mine Countermeasures

There are three essential elements to passive MCM:

- **Locating minefields.** Intelligence is usually the trigger for operations to locate minefields. Information about potential adversary mining and MCM capability may be one such trigger. Others can include, during times of tension, abnormal movements of foreign ships or aircraft in the waters surrounding Australia. History has shown, however, that often the loss of vessel due to striking a mine is the first indicator of the presence of a minefield.
- **Localising the threat.** The mine threat can be reduced by localising it and then avoiding high threat areas. This involves keeping shipping in deep water for as long as possible and establishing diversions around high threat areas. Identification of mine threat areas may result in the closure of specific routes or ports, thus necessitating the diversion of critical cargoes to other open ports.
- **Risk reduction.** Measures that can be taken to reduce the risk from sea mines include:
 - disguising the actual routes to be used by shipping
 - where possible, reducing the magnetic signature of ships (known as degaussing and normally limited to warships)
 - minimising ships' pressure and acoustic signatures
 - using jamming or masking systems to confuse or 'blind' mines
 - undertaking seabed surveys to build seabed and environmental databases (i.e. it proves useful to know what is in the area so that new items, such as mines, stand out more clearly).

Active Mine Countermeasures

Mine-hunting and minesweeping are the two main forms of active MCM:

- **Mine-hunting.** High definition sonars can detect and classify most kinds of mines, which can then be destroyed or neutralised with remotely operated mine disposal vehicles or by divers. Mine-hunters equipped with forward-looking sonar have an advantage in searching for pressure mines, in that they can detect the mines without passing over them. Consequently, mine-hunting is normally preferred to minesweeping if the urgency of clearance is not an issue, where seabed and sonar conditions are good and when pressure mines are the main threat. Environmental conditions are key to the effectiveness of mine-hunting, along with the capability of the sonar and its operators.

The RAN's MHC force is capable; although limited in size. MCM vessels are relatively small, and are constrained in speed and endurance. Other factors that influence planning include the limited crew numbers and armament. The former determines the possible tasking cycle, while the latter will necessitate protection by other units when operating in a hostile area.

- **Minesweeping.** Minesweeping is preferred against a known moored-mine threat, particularly where the proportion of undetectable mines is believed to be high, and environmental conditions are likely to degrade sonar performance. There are two primary means of minesweeping, influence and mechanical, both of which involve the towing of sweeping systems behind the minesweepers. Influence sweeping is the primary means of dealing with magnetic or acoustic mines and involves the use of a variety of sweeps, possibly extending to drone boats to emulate the MCM vessels signature against sensitive acoustic or magnetic mines. Mechanical sweeping is the preferred method used against known moored mines. It involves the physical cutting of mooring lines and thus exposes the MCM vessels to greater risk.
- **Clearance Diving.** The clearance of mines from very shallow water can be carried out by clearance divers, using a variety of bottom search techniques.

Mine Countermeasures and Shipping

The core aim of MCM is to provide safe routing for all shipping. Consequently, much can be done before the outbreak of hostilities to ensure safe passage of shipping in time of conflict. A fundamental task is the identification and establishment of 'Q' Routes. These are established as a result of routine peacetime route surveys by MCM vessels. These routes traverse known seabed topography conditions that assist with the identification of underwater objects, including mines, and thereby make any mine clearing activity an easier prospect. 'Q' Routes can be established for transit, coastal waters approaches and links between other routes.

Clearance Diving Operations

RAN clearance divers are a small group of highly-trained and well-equipped specialists who operate in teams, with the principal task of identifying and rendering safe explosive devices found in shallow water; especially in ports and harbours. They are the ADF's only underwater explosive ordnance and improvised explosive device disposal capability. Clearance divers are capable of diving to significant depths, and also operate in the littoral and on land when and where required.

Specific tasking will include:

- MCM, which may also involve explosive ordnance and improvised explosive device disposal
- expeditionary reconnaissance involving intelligence collection, surveillance and target acquisition
- advance force operations
- amphibious pre-landing forces
- under-water battle damage repair.

Clearance divers can rapidly deploy by land, sea or air. For maritime advance force operations, clearance divers normally operate clandestinely to conduct reconnaissance, survey and clearance tasks.

FUTURE ISSUES FOR LITTORAL OPERATIONS

The nature of the littoral is not expected to change significantly and the challenges of operating in it will not diminish. The increasing number of natural and other disasters in Australia's region of interest, together with the ongoing requirement for stabilisation operations will see a continuing demand for the services of amphibious and sea lift forces.

Nevertheless, the supporting functions provided by mine warfare and hydrographic forces may take different forms in the future. For the mine warfare force an associated change is likely to emerge in the form of more advanced remotely operated vehicles or unmanned underwater vehicles for use in mine search localisation, destruction or neutralisation. Hydrographic forces will still be required for maritime operations but the means of obtaining essential data may change.





13. CONSTABULARY OPERATIONS

- Constabulary operations are associated with the protection of sovereignty in the maritime domain and the maintenance of good order at sea.
- The RAN's primary constabulary task is the enforcement of Australian legislation through surveillance, patrol and response operations.
- Maritime Border Command (MBC) is the lead organisation, for the Australian Government, with respect to offshore security. It undertakes planning, preparedness, prevention, response and recovery-related maritime security activities, including responses to terrorism threats or incidents originating from Australia's maritime domain.

Constabulary operations are the main function of many navies. In the domestic context, the constabulary function involves policing territorial waters and enforcing a nation's sovereign rights over the resources, living and non-living, in their offshore zones. Beyond these zones such operations are more concerned with maintaining global good order at sea.

Most Australian domestic maritime constabulary operations are conducted by Maritime Border Command with significant contributions from the ADF and other organisations as necessary. RAN elements are frequently committed to these activities, with the primary naval task involving patrol and response operations for the enforcement of Australian legislation in offshore zones.

Environmental and Resource Management and Protection

One of the most important constabulary functions comes from humanity's continuing reliance on the sea as a source for food. Additionally our increasing ability to exploit its non-living resources, and the extensions to maritime boundaries have now placed a large proportion of these resources under the control of coastal states.

Around 150 million tonnes of fish are harvested around the world each year, of which 130 million tonnes becomes food. From this, some three billion people gain 20 per cent of their protein intake. Current harvesting rates far exceed the biological sustainability of fish stocks.

Operations to counter illegal fishing in Australia's waters are ongoing. The RAN's contribution to this activity is provided mainly by patrol boats and encompasses patrols aimed to detect illegal foreign fishing, prevention of illegal activities in designated areas, and assistance with prevention and management of marine pollution. A strong deterrent focus is maintained by aerial surveillance and surface patrols; particularly in Australia's northern waters.

Illegal, unregulated and unreported fishing activities have also spread to the southern waters around Heard, MacDonald and Macquarie islands. Bilateral treaties with France enable surveillance and joint patrols of each other's maritime zones in the Southern Ocean. Licensing limitations on foreign fishing operations within the EEZ now mean that distant water fishing fleets, operating in the high seas adjacent to the zone, need to be monitored for compliance with Australian fisheries law. Rules of engagement may permit the ADF to disable non-compliant foreign fishing vessels by graduated uses of force.

Maritime Cooperation

RAN patrol boats took part in coordinated patrols with Indonesian Navy surveillance and patrol units in the Arafura Sea as part of Operation AUSINDO CORPAT in April 2011. The patrols were primarily aimed at deterring illegal foreign fishing but were also concerned with other illegal maritime activities. This kind of cooperative approach to constabulary operations is now well established and continues to be conducted to maintain pressure on illegal foreign fishers.

Access to oil and gas reserves is important as global demand for these energy sources increases. About one third of the world's oil and gas reserves are located under the sea and there is growing commercial interest in exploiting them - even in water depths down to 3000 metres. The vast majority of these offshore sources will be in territorial waters, EEZ or the extended continental shelf of the coastal state.

Australia's oil and gas installations are located in Bass Strait, where they are relatively close to the south-east coast of Victoria and off the north-west coast of Western Australia, where they are more remote. In most cases the installations have submarine pipelines connecting them to the processing facilities ashore. While the size and position of the installations makes them difficult to attack, their significance to the Australian economy makes them attractive targets.

Search and Rescue

Navies routinely conduct Search and Rescue (SAR), even though they may not have primary national responsibility. Military ships and aircraft are tasked because of their capacity to respond quickly, to travel long distances, to search large areas and to provide effective communication links with other authorities. In Australia, the Australian Maritime Safety Authority (AMSA) is responsible for the Australian Maritime Search and Rescue Region which covers over 58 million km². AMSA calls on additional resources, Defence or civilian, to assist in SAR operations whenever its own resources are insufficient to complete a task. An additional requirement of the *International Convention for the Safety of Life at Sea 1974* (SOLAS) is that the master of a vessel at sea which is in a position to provide assistance, upon receiving a signal that persons are in distress, is bound by law to proceed as quickly as possible to their assistance.

Search and Rescue Operations

One of the most dramatic SAR operations conducted by the ADF in recent decades was the rescue of two yachtsmen competing in the 1996-97 Vendee Globe single-handed around the world yacht race.

On 5 January 1997 two yachts (*Amnesty International* and *Exide Challenger*) capsized in the Great Southern Ocean, within Australia's Maritime Search and Rescue Region. The Australian Maritime Safety Authority requested ADF assistance. P-3C Orion Maritime Patrol Aircraft from RAAF Base Edinburgh commenced a round the clock search for the two yachts. On 6 January both yachts were located and the crew from an Orion aircraft dropped life rafts to both yachtsmen. Thierry Dubois, on board *Amnesty International*, left his sinking vessel for the relative safety of the life-raft, however Tony Bullimore in *Exide Challenger* remained in an air pocket inside his up-turned vessel.

The frigate HMAS *Adelaide* then sailed from Fleet Base West to rescue the yachtsmen. Due to the distance that the frigate had to cover, the tanker HMAS *Westralia* was also dispatched to support *Adelaide* and refuel her as necessary.

On 9 January 1997 the first yachtsman, Thierry Dubois, was located by *Adelaide* and winched onboard the frigate's S-70B Seahawk helicopter. *Adelaide* then steamed towards the second stricken yacht. The frigate located the vessel and deployed her rigid hull inflatable boat. Bullimore, who had been living inside the up-turned hull swam out and was rescued by the crew of the boat. *Adelaide* then returned Dubois and Bullimore to Western Australia.

Defence Force Aid to the Civil Authority

There are occasions where State and Territory authorities may not have the resources or capabilities to react to an incident and Commonwealth aid might be requested. Under a whole-of-government response, the ADF can be tasked to provide aid. An example of this was the April 2003 interception by the frigate HMAS *Stuart*, off the coast of New South Wales, of the North Korean- flagged merchant vessel *Pong Su*, which was carrying illegal narcotics.

Maritime Barrier Operations

Illegal maritime arrivals. Potential illegal immigrants attempting to enter Australia by boat create a border protection challenge. The Navy continues to deal with the illegal flow of immigrants as part of Operation RESOLUTE, which since July 2006 has encompassed all aspects of maritime border security.

Bio-Security (quarantine) operations. These tasks involve working with the Department of Agriculture and Water Resources, and other governmental agencies, to ensure that Australia's bio-security is not compromised by the introduction of pests and diseases. This can involve RAN vessels working on behalf of the Department of Agriculture and Water Resources in the interception, search and possible seizure of foreign vessels.

Anti-smuggling operations. Operations to counter smuggling can involve the search for and seizure of prohibited imports such as narcotics and weapons, as well as legal but dutiable goods, and are normally conducted by law enforcement authorities. Navy involvement is usually through RAN ships assisting appropriate law enforcement bodies - such as the Australian Federal Police or the Australian Border Force (ABF).

Counter-Piracy Operations

Armed robbery within the territorial sea and piracy on the high seas are virtually unknown in the waters around Australia. Any instances would be dealt with by RAN or ABF patrol boats. Since 2009, the RAN ship committed to operations in the Middle East under Operation SLIPPER (Operation MANITOU since mid-2014) has been flexibly deployed across the three combined task forces under the control of Combined Maritime Forces to assist in counter-piracy operations.

Peace Operations

Peace operations encompass several different kinds of activities: those associated with conflict prevention, peace building, peace keeping, peace enforcement, peace making, and preventative diplomacy. They tend to be mounted in response to resolutions by the UN Security Council, by individual states or by multinational forces, to deal with emerging or deteriorating security situations and are often associated with diplomatic activity before and during the operation.

Dependent on the circumstances most of the military involvement in peace operations will be made by ground forces, with air and naval forces often acting as enablers. Air and naval forces are often used for the transport of troops, equipment and supplies and also for the movement of civilians affected by conflict. The intensity and nature of conflict can, however, dictate that air and naval combat capability also be called into play. An example is the UN operation to bring peace to the Balkans, during the 1990s, involved the use of UN-sanctioned air strikes by land and sea-based NATO aircraft.

RAN ships have long been used in transport, command and communications roles for peace operations and also as venues for diplomatic discussions aimed to resolve conflict. Significantly, it is now routine for RAN personnel to participate in peace operations ashore as part of ADF deployments. This illustrates the requirement for some Navy personnel to develop skills, and receive specialist training, more usually associated with land forces.

Sanctions or Embargoes

Sanctions and embargo operations are non-lethal, in a direct sense, in that either no force or minimal force is needed to achieve the objective. The more successfully they are prosecuted, however, the greater may be the indirect consequences, such as shortages of food, medical supplies and other essential commodities for affected populations.

Sanctions and embargo operations are not easy to mount and are rarely entirely effective. Planning factors include:

- a requirement for coordinated multinational efforts of naval and air forces, over a large area and using at least complementary rules of engagement
- an awareness of geography, noting that long maritime borders, porous land borders, and/or narrow waterways may provide the means to avoid the full impact of the sanctions or embargo operations
- recognition that not all countries necessarily support sanctions and embargo operations for their own political reasons, thereby weakening any potential impact.

Nevertheless, by applying non-lethal means to a problem, international support may be garnered for the future use of more forceful methods in the event of unsuccessful sanctions or embargoes. As has been demonstrated in recent years, the political will to maintain operations over extended periods does exist, despite the difficulties. One very good example of this is the RAN participation in Operation DAMASK (later Operation SLIPPER) in the Arabian Gulf, during and after the 1991 Gulf War. This operation aimed to apply and enforce sanctions against Iraq and continued until June 2003. It demonstrated that even a large land-locked country cannot maintain or develop a sophisticated war machine in the face of sustained maritime enforcement of international sanctions.

FUTURE CONSTABULARY OPERATIONS

Australia has transitioned from a reactive approach to constabulary operations to an intelligence-led, risk-based approach. This has meant the application of a consistent surveillance and patrol effort and the acquisition of ships and aircraft capable of meeting the demands of the task. Unless there is a significant diminishing in the nature and extent of threats confronting Australia, the deterrent approach is likely to remain in place.

For future surveillance, maritime patrol aircraft are almost certain to be complemented by the substantial use of other means. Satellites may feature strongly, along with UAS which can include a mix of high altitude, long-endurance aircraft and shorter range vehicles. Such a mix should enable persistent surveillance over selected areas. Land-based search sensors are also being used to a greater extent. Developments in over-the-horizon and high frequency surface wave radars also allow these to become useful complements to aerial surveillance.

Evolution of the surface patrol and response capability will occur, with future patrol vessels likely to be significantly larger and more complex with a requirement to upgrade the support infrastructure available for them. Finally the use of leased vessels, crewed by ADF, or ABF, personnel has been undertaken, in recent years, to increase the number of platforms at sea for constabulary duties and is likely to continue in the future.





14. DIPLOMATIC OPERATIONS

- Naval diplomacy is used by governments to influence the thinking and behaviour of other governments without using force.
- Navies are involved in diplomatic operations due to the unique characteristics that warships possess.
- Coercion does require a demonstrated ability to escalate a situation through military action if necessary.

Diplomatic Operations and their Demands

Diplomatic operations range from the benign use of maritime capabilities to influence nations (or in some cases non-state actors) through to the threat, or actual use, of force. These operations are sometimes also described as 'shaping operations' as they are primarily designed to influence the policies and actions of other nations. The types of diplomatic operations undertaken by the RAN include:

- humanitarian assistance and disaster relief
- assistance to allied and friendly nations
- presence
- evacuations
- preventative diplomacy
- coercion.

Diplomatic operations may be conducted in home waters, in the waters of a friendly country to which assistance is being provided or in other waters where statements of military capability, or intent, are to be made. In the last case, one of the major advantages of a naval force is their capacity to remain over the horizon (just outside another State's territorial sea) for extended periods providing a ready capability without creating an immediate need for the coastal state to respond.

Because warships are designed for maritime combat, there are some prerequisites for success when conducting diplomatic operations. These are:

- an accurate picture of the operational situation - which depends on adequate maritime domain awareness
- offensive and defensive power appropriate to the task - this may range from small arms to a warship's main armament, depending on the nature of the operation
- forces tailored as much as possible to the mission - coastal or riverine operations will demand different forces to open-ocean tasks
- speed of response – the capacity to intervene early may enable quick and peaceful resolution of issues
- controllability – warships must be subject to the overall political aims of the operation, to avoid over-reaction or failure to act when needed.

In addition to these prerequisites, planning for diplomatic operations needs to consider other characteristics, including:

- **Versatility.** The greater the ability to change posture quickly, the greater the range of tasks that an individual warship is able to accomplish
- **Force protection.** Warships must be able to deal with certain escalating situations without necessarily resorting to the actual use of force
- **Combat power.** Where individual ships are deployed, war-fighting skills may degrade over time, although multi-ship deployments may not always be appropriate for certain tasks
- **Readiness.** Ships' companies need to be well-trained, educated, determined and resilient. They also have to be decisive, patient, tactful and disciplined. To that end, ships must be fully mission ready when they enter an area of operations.

RAN Cruisers and Diplomatic Operations

The cruiser HMAS *Adelaide*'s round the world cruise as part of the RN Special Service Squadron in 1924-25 and HMAS *Brisbane*'s secondment to the China Station in 1925 are early examples of RAN diplomatic operations. During World War II *Adelaide* was also tasked to help install a Free French government in New Caledonia, when it appeared that Vichy French supporters, who were sympathetic to Nazi Germany, might seize control of the territory. The threat of force from *Adelaide* was enough to influence those ashore to install a government supportive of the Allied cause.

THE VALUE OF NAVAL DIPLOMACY

Navies play important roles in advancing national interests in peacetime. Naval diplomacy can be used, by one or more governments, to shape the thinking and behaviour of another nation without resorting to the threat or actual use of force.

Navies are also involved in diplomatic operations due to the unique characteristics that warships possess. A fundamental characteristic of navies is their ability to operate freely over vast areas of the world's oceans. This gives them immense flexibility in dealing with a range of benign and coercive operations. Warships may operate up to the 12 nm territorial sea boundaries of states – and even inside those boundaries within the limits of the innocent passage regime.

They may be deployed quietly off a foreign coast and may be removed just as quietly with few, if any, repercussions. This allows a government to hedge against uncertainty.

Another attribute of navies which contributes to their use in diplomatic operations is their capacity for multinational activities. While this capacity is not unique to navies, their traditional modes of operating offer particular advantages. Because of the freedom which operating at sea has always given navies, they have built up rules by which they operate that involve common customs and courtesies. The multinational forces, operating under informal but coordinated arrangements, providing security in the waters off the Horn of Africa is a recent example of the concept.

Multinational diplomatic operations can be useful in a range of circumstances.

These include:

- **Sending messages.** This can be done through port visits and also through the cancellation of such visits, either by the sending or hosting nation
- **Reducing the risk of inadvertent conflict.** Multinational naval forces can be used to help build confidence among neighbouring nations. This is especially important in the Indo-Pacific region, which has many unresolved maritime security issues including boundary disputes and resource competition
- **Naval reassurance.** Port visits by other nations warships provides explicit evidence of support to a nation in what may be troubled times
- **Improving future coordination efficiency.** Current trends suggest that future naval operational activity will be multilateral. Consequently, to provide some assurance that multinational partners are able to operate effectively when necessary, multinational exercises are planned regularly
- **Cooperative effort.** The patrols in the Strait of Malacca involving the navies of Singapore, Malaysia and Indonesia in a coordinated counter-piracy operation is an example of cooperative effort. Supplemented by surveillance flights, that involve Thailand, these patrols serve a useful operational purpose while also helping to build trust and confidence between participants.

HOW DIPLOMATIC OPERATIONS ARE CONDUCTED

Navies provide foreign policy options for governments that might not otherwise be available. There are five ways in which maritime forces can be applied to the conduct of diplomatic operations. These are:

- **Standing demonstrations of naval power.** Depending on the circumstances, even a single ship can provide a standing demonstration of naval power and there are several ways that such a demonstration can be used to achieve desired outcomes:
 - Force level changes through the increase or decrease in the number of ships deployed.
 - Display of force, which can range from aggressive manoeuvre or movement to evoke a response through to port visits or inshore transits for similar purposes.
 - Force changes that may involve increasing or reducing visible combat readiness to signal concern or disengagement.
 - Display of capabilities that may include intensive reconnaissance as a prelude to other activities, or the deployment of force elements for the same reason.
- **Specific operational deployments.** These are invariably special cases of standing demonstrations that involve the deliberate and determined use of one or more warships in a crisis or low level conflict. Such action may be initiatory or reactive and may aim to deter or to support other states.
- **Naval aid.** This can be physical in the form of gift/sale of ships or other equipment or the provision of services such as mine or other ordnance clearance. It can also include the attachment of naval advisors or liaison officers to provide training or other forms of assistance.
- **Operational calls.** These are port visits that are made for replenishment of supplies and for crew rest. Nevertheless, such visits can be used to create favourable impressions of the visiting power, through the presentation of the visiting ships and the behaviour of their crews ashore.
- **Specific goodwill visits.** These are made to generate a political effect and can be conducted by a single ship through to task groups. Related activities can include receptions for local dignitaries, ceremonial activities and 'good works' conducted by ships crews (i.e. the repair of local school buildings). The underlying aim in all cases is to court the host country and gain diplomatic capital, and these visits can also enhance the economy of small nations.

TYPES OF DIPLOMATIC OPERATIONS

The RAN conducts diplomatic operations as part of a whole-of-government activity as the flexibility and versatility of warships allows their use and posture to be fine-tuned dependent on the government's goals and intentions.

Humanitarian Assistance and Disaster Relief

The RAN continues to be heavily involved in humanitarian operations overseas, both in response to major events such as natural disasters and in dedicated operations to provide health care and other assistance to regional countries. Humanitarian assistance and disaster relief operations also have a domestic element in the form of Defence Assistance to the Civil Community. This form of assistance is usually provided as a response to an emergency, such as a fire or flood, but it can also be associated with ceremonial activities of national or state significance, such as Anzac Day.

Emergency response can be provided to state or territory authorities, including law enforcement bodies, where there is no likelihood of ADF personnel using force. Defence Assistance to the Civil Community will be provided subject to being formally requested and is generally an acknowledgement that local authorities are unable to deal with the emergency unaided. Defence Force Aid to the Civil Authority is a separate activity and ADF personnel could be used in law enforcement activities where force is expected to be used. This has rarely been undertaken in Australia and would require all other options to have been exhausted prior to being enacted.

Assistance to Friendly Nations

Naval assistance to friendly nations can take the form of humanitarian or military assistance. Humanitarian assistance can involve a wide range of activities:

- Goodwill visits can be made by individual ships or task groups, either specifically for the purpose of assisting a neighbouring or friendly country or incidentally as part of a deployment with other objectives. During such visits, ships' crews can undertake community help activities which often include maintenance of buildings and machinery for schools, hospitals or other civil facilities. These activities are most valuable when they are repeated, so that a level of commitment to the country is demonstrated.
- Goodwill visits need to be planned sensitively for best effect. For example, patrol boats or other minor war vessels may be more appropriate for visits to small island nations whose facilities might be overwhelmed by larger ships and their crews.

Military Assistance to Friendly Nations

Assistance to friendly nations can also take the form of helping to improve the capability of their maritime forces. There are many ways in which this can be done, ranging from the transfer of equipment, the conduct of bilateral or multilateral exercises to the provision of training – either in Australia or their own country

The Pacific Patrol Boat Program

Under the Pacific Patrol Boat Program, 22 patrol boats were donated to 12 Pacific Island countries, often providing them with their only capacity for responding to resource exploitation in their large Exclusive Economic Zones. Australia also provided training for their crews by the Navy and also at the Australian Maritime College. Furthermore, the RAN provides experienced officers to act as Maritime Surveillance Advisers and senior technical sailors to assist with maintenance of the patrol boats in-country. The benefits to the recipient countries are manifest and go beyond the project itself, as the skills gained by boat crews also translate into the local communities more broadly.

Presence

Presence operations are conducted in areas of strategic significance to convey a level of interest by the operating country. Naval presence can take several forms, including passage through local waters, port visits, exercises and demonstrations of capability to reassure, impress or warn.

Presence is one of the key methods by which navies generate influence in peacetime through the ability of warships to operate, for extended periods, outside territorial waters but yet close enough to shore to register in the decision-making of local authorities.

Evacuations

Operations to enable the evacuation of Australian citizens, and other approved foreign nationals, are conducted in support of the Department of Foreign Affairs and Trade. Such evacuations may be needed from foreign countries when lives are endangered by war, civil unrest or natural disasters.

Depending on the location of the evacuation, there may be a delay in getting ships to the planned evacuation point or a lack of suitable port facilities; this may affect the efficiency of an evacuation. If speed is paramount and airports are available, and useable, then civil/military airlift is the preferred method of evacuation, although the sheer scale of a requirement may still require the use of warships.

Generally, the operational environment is depicted as being at one of three levels. These are:

- **Permissive:** commonly following a natural disaster or civil unrest, where no resistance to the evacuation is expected. The use of military assets may result due to the scale of the proposed evacuation, the need for logistics and medical support or the fear of deterioration in the operational environment.
- **Uncertain:** most commonly applies where security has been de-stabilised and the host nation government may not exercise complete control of its territory or population. Interference with the operation would not be expected, but it could occur and host nation support cannot be relied upon.
- **Hostile:** generally applies where the host nation authorities have lost control or have ceased to function and there is a general breakdown in law and order. The lives of non-combatants may be threatened and obstruction of the evacuation operation may occur.

Evacuations in uncertain and hostile conditions could involve the insertion of ADF combat forces into the host nation in order to protect diplomatic staff, dependants and other approved evacuees. This may require cooperation among several countries that also intend to mount operations in support of their own nationals.

Operation PLUMBOB, 2000

In June 2000, the heavy amphibious ship HMAS *Tobruk* was diverted from another task to undertake a non-combatant evacuation of Australian and approved foreign nationals from Honiara in the Solomon Islands. LCM 8 landing craft carried by *Tobruk* transferred 486 evacuees from the shore to the ship for the transit to Cairns. This was a permissive evacuation but the security situation was fragile and resulted in *Tobruk* remaining in Honiara, over night, to maintain a presence until she was relieved by HMNZS *Te Mana* the following day.

Preventative Diplomacy

Preventative diplomacy is aimed at mitigating potential disputes and avoiding escalation. The ability of warships to conduct such operations comes from several of their inherent characteristics. Warships can poise in an area for extended periods and are sufficiently flexible to be able to respond to a range of different circumstances at the same time.

Warships used for such operations may be tailored to the nature of any anticipated action so, if there is a potential requirement for troops on the ground, amphibious ships should be part of the force mix. Major or minor surface combatants are always useful to any force because of the range of force application options they incorporate. By its nature, preventative diplomacy may be the prelude to a range of other diplomatic operations, such as non-combatant evacuation operations and assistance to friendly nations.

In contemplating preventative diplomacy operations some of the planning consideration should be given to the:

- location of the operation and limitations that might flow from it, including the nature and size of warships or other force elements best suited for the task
- nature of the security situation and how it might develop if preventative measures are not successful
- relations between the Australian Government and the government of concern
- number of Australian citizens, and other approved foreign nationals, that require evacuation
- possible duration of the operation.

Coercion

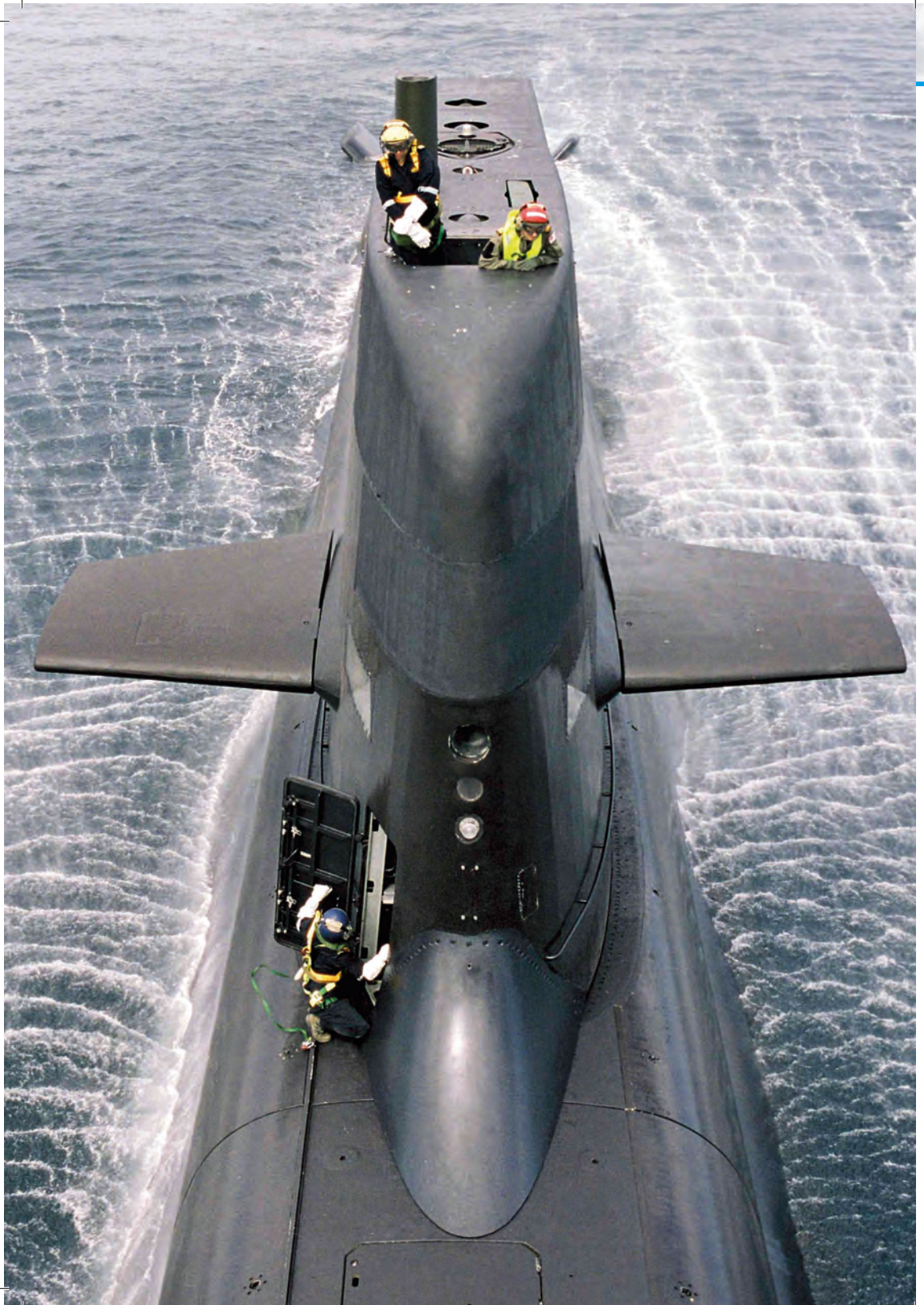
Coercion in operations relies on portraying the threat of force as opposed to its actual use. The aim is to demonstrate a willingness to escalate a situation through military action if necessary, thus persuading an adversary to compromise on their desired outcome, or compel them to meet one's demands.

For navies, this may be through the positioning of units, such as warships or submarines, off the potential adversary's coastline, without necessarily violating national sovereignty. This may be in addition to deployed land forces and air power assets, the combination of which provides a formidable presence. Naval platforms play a key role as an effective deterrent, as in most situations, they have a coercive effect disproportionate to their size and number.

FUTURE DIPLOMATIC OPERATIONS

Australia's naval forces will continue to be used to conduct diplomatic operations in the future. Warships are excellent platforms to provide support both in Australian waters, and overseas, via benign tasks such as humanitarian aid and disaster relief through to the more obvious and, if necessary, coercive measures to influence a potential adversary. Warships can change their force posture from benign to potentially hostile quickly and more easily than land or air units.





Annex A - The Submarine Force

Submarines are an essential part of Australia's naval capability, providing a strategic advantage in terms of surveillance and protection of our maritime approaches. Our submarine force exists to shape and change the behaviour of nations, deter aggression and coercion and to defeat attacks against Australia. Submarines have the inherent attributes of stealth, range, endurance and significant strike power. The key military capabilities of Australian submarines include: anti-submarine warfare; anti-surface warfare; intelligence surveillance and reconnaissance; and support to special operations. These all contribute to their role as a strategic deterrent capability.

Optimised for high end military operations they have limited utility in most constabulary and diplomatic roles. However they have important roles throughout all phases of maritime campaigns and are capable of operations in the challenging maritime domain.

A Strategic Capability

Submarines are able to operate independently at long range for prolonged periods. They have the capacity to covertly gather intelligence, while remaining undetected, and if required conduct strike with guided weapons against both submarines and surface forces. The employment of submarines is normally held at the strategic/operational level and they are generally not deployed as part of a task group.

With long range and endurance submarines can reach areas far distant from their home port and establish a persistent presence. Having reached these areas they have the ability to gather and process acoustic, electromagnetic and environmental information through a variety of sensor types. This type of intelligence is such that other assets or systems cannot easily or discretely collect.

The stealth of submarines enhances the range of options available to the Government to protect national interests. In conflict, and during periods of tension, submarines can operate in areas where sea control has not yet been established for surface forces. This elevates the level of risk for an adversary and thus sea control and sea denial can be improved, thereby enabling subsequent military operations.

To provide an effective deterrent submarine force, Australia's submarines must be regionally superior, underpinned by a highly resilient and professional workforce, able to complicate the military development plans of an adversary and impose upon them the need for complex and costly ASW capabilities to minimise the threat posed by submarine forces. Ultimately submarines must be able to exercise discrete maritime strike operations against adversary submarines and ships.

The Operating Environment

The undersea environment remains challenging to maritime operations and warfare. There currently remains the need for crewed submarines, though advanced unmanned underwater vehicles may well be used to complement future submarine operations.

As additional nations seek to acquire their own submarine capability, the ability to exploit the advantages of operating under the sea become increasingly important. This requires a detailed understanding of the sub-surface environment, the capacity to draw as much information from acoustic and other sensors as possible and the ability to reduce the risk of counter-detection. Submarines depend on a sonar suite capable of collecting and processing acoustic data that is used to identify the signature of an adversary whilst remaining undetected themselves.

Submarines also rely on a suite of above water sensors necessary to exploit the electromagnetic spectrum, allow secure communications and enable safe navigation. At the same time submarines must retain the ability to operate independently and without reliance on processes that can constrain their potential or compromise operations.

Operating under the sea generates specific demands on both platform and personnel. Accordingly, submarine design is complex and has specific requirements with an understanding of what is feasible in terms of cost, build and supportability. Build quality is essential from a safety perspective but, like design, can have significant implications for performance and future upkeep of a submarine. Sustainment must also be approached with the aims of maintaining materiel integrity while improving reliability and minimising costs.

Submariners require specific training and experience to generate the necessary skills and technical competence. This must encompass the ability to conduct operational maintenance and attend to defects that might arise in the normal course of operations without undue reliance on shore-based support.

The Military Environment

The employment of submarines requires careful consideration of their capabilities and how they can best contribute to the overall maritime campaign. This requires an understanding of the likely threats and a preparedness to continuously develop an appreciation of the evolving nature of maritime warfare. Submarines are most effectively employed in preparatory (i.e. intelligence, surveillance and reconnaissance) or offensive operations as, historically, they have performed poorly when employed in a defensive role.

Submarines must be capable of operating as part of an integrated joint or multinational force. Regionally superior submarines with a high inter-operability with the United States (and other regional forces) provide Australia with an effective deterrent. The effectiveness of this deterrence depends on the availability of robust doctrine, tactics, techniques and procedures.

Submarines are equipped with a large weapon payload (with increasingly extended ranges) and they can remain on station for long periods of time and evade detection and re-position for further strike activities. The decision to transition from surveillance to strike operations will normally be made at the strategic level as once a submarine commits to an offensive action its presence within an area becomes known. They have little capacity to slowly escalate action as submarines cannot fire warning shots or provide indirect fire. Once committed to offensive action the results are often significant and can have a strategic effect. For example, the sinking of the Argentine cruiser *General Belgrano* during the 1982 Falklands War by the British submarine HMS *Conqueror* forced the major surface elements of the Argentine Navy to remain in port. This restricted attacks on the British Task Force to those that could only be undertaken by submarines and land-based aircraft.

THE COLLINS CLASS SUBMARINE

The *Collins*-class submarine is a long-range, high-endurance submarine fitted with an advanced combat system and armed with heavy weight torpedoes and encapsulated anti ship missiles. The same combat system and weapons are utilised in US submarines, and both continue to be developed as technology evolves and new threats emerge.

The *Collins*-class submarine is also particularly potent with advanced anti-surface and anti-submarine capabilities. Equally important is the capacity to carry a range of other payloads, including equipment for surveillance and intelligence collection; made possible by the submarine's size and the power and cooling capacity that supports the combat system.

As a conventional submarine, the *Collins* class remains dependent upon diesel fuel for its generating capacity, and battery performance to meet range, endurance, and other operational requirements.

Military Tasks

The *Collins* class is capable of a number of tasks, however, maximum benefit is derived from turning its tactical advantage into operational flexibility, which creates a strategic effect. This is best achieved by focusing on its capacity to conduct anti-submarine warfare, anti-surface warfare, intelligence, surveillance and reconnaissance and support to special operations at long ranges and for extended periods.

This flexibility allows the *Collins* class to be employed across all phases of a maritime campaign, including precursor operations to achieve intelligence collection, maritime strike and even blockade. Often these roles are conducted forward of a prescribed area of operations. In doing so the submarine contributes to sea denial, but can also contribute to sea control; particularly in targeting the sea denial capabilities of an adversary.

Tempo

Normally, three submarines would be available for tasking at any one time. Additionally, there is an expectation that at least one submarine could be sustained on station over extended periods. Weapon payloads depend on missions, but submarines generally embark a large number of its primary weapon (torpedoes) for operations, providing the flexibility to transition between various phases of a maritime campaign. Some payload trade-off might be required for particular missions, especially when supporting special forces operations. The decision on weapon load out must be made judiciously as there is often little opportunity to change this once the submarine has departed port.





Annex B - The Surface Force

The surface force consists of the Surface Combatant Force, the Amphibious Warfare Force and the Afloat Support Force. The Amphibious Warfare Force and Afloat Support Force are generally lightly armed and are not fitted with the variety of sensors carried by surface combatants. This makes them more vulnerable to hostile action, and underlines the need to provide protection in high-threat situations. The appropriate allocation of combat effort to provide an escort for these vessels is a key consideration for operational planners.

SURFACE COMBATANT FORCE

In their war-fighting role, surface combatants are expected to counter a wide variety of threats across all domains. They must be capable of conducting constabulary tasks such as dealing with piracy, illegal fishing, bio-diversity (quarantine) infringements, human trafficking, drug and arms smuggling and illegal maritime arrivals. Furthermore, they must be able to participate in an equally broad range of diplomatic operations either independently, or as part of a larger task force.

Current Capability

The Surface Combatant Force currently consists of two *Adelaide*-class FFGs and eight *Anzac*-class FFHs. Significant upgrades for both classes of ship to maintain their effectiveness in a multi-threat situation have been conducted. As a result, both classes have significant sensor and weapon capabilities. These include the Harpoon missile, a close-range anti-air warfare capability, a strong defensive undersea warfare suite and the highly-capable Link 16 tactical data link system.

The FFGs have a 76mm dual-purpose gun (surface warfare and air warfare) and an enhanced area air warfare capability with the long-range SM-2 missile and shorter range Evolved Sea Sparrow Missile (ESSM). They are capable of operating one or two Seahawk helicopters which, in addition to its own weapons suite, is also a very capable surface search and targeting platform for the ship-launched Harpoon.

The FFHs possess an advanced close-range air warfare capability, with the vertical-launch ESSM system, conventional surface warfare and naval gunfire support capability, with a 5-inch gun, and can operate a single Seahawk helicopter.

The Hobart Class Destroyer

The RAN is acquiring three *Hobart*-class guided missile destroyers (DDGs). These are modern and effective surface combatants incorporating area air warfare sensors and weapons which have an enhanced capability in the other warfare areas. They have a much increased command and control capability through advances in communications and network enabled warfare concepts. This includes the cooperative engagement capability that exchanges fire control quality, fused sensor data around a force, and improved real time track and identification continuity.

The DDG provides a core capability for the RAN and allows it to participate in command and coordination operations across a variety of low, medium and high-threat situations. The air warfare systems provide a networked capability with RAAF airborne early warning and control, maritime patrol and fighter aircraft to provide sea control in the littoral and on the high seas.

The DDG's primary weapons systems include SM-2, ESSM and Harpoon missiles, a 5-inch gun, dual tube light weight torpedo launchers and the ability to operate and support a Seahawk helicopter capable of carrying torpedoes. The ship relies on the advanced Aegis combat system which enhances connectivity with multinational partners. The first of these vessels will commence service in 2017.

THE AMPHIBIOUS WARFARE FORCE

Amphibious forces, by their nature, possess mobility in mass, but their defining characteristic is their unique cross-domain mobility and they are useful across the full spectrum of military, constabulary and diplomatic tasks. In periods of tension putting a maritime force to sea can be prudent, providing a gesture of support to Allies or a threat to adversaries. The capacity to provide a sustained forward presence is a powerful diplomatic tool, while its ability to manoeuvre freely at sea can be used to escalate or defuse tensions as required.

The ability to poise, close to potential trouble spots, and then react quickly en masse makes an amphibious force more flexible than a purely sea-lift force. When pre-positioned, it is the fastest acting and most flexible intervention force available to a government and is able to respond immediately and proportionately to events on the ground. Properly constituted, it carries sufficient combat weight to act alone or form the nucleus of a larger task group. It represents a robust form of forcible, or theatre, entry capability

The agility of an amphibious force depends on specialist equipment including amphibious ships, landing craft, helicopters and amphibious vehicles. Less obvious, but equally critical, is equipment compatibility. Achieving this is an iterative process, as allowing any one capability to drive the entire system requirement invariably results in an imbalance.

In summary, an amphibious force with a relatively small landing force (by conventional land warfare standards) generates a unique and disproportionate effect. Australia's geography favours joint manoeuvre, exploiting the sea to bypass and dislocate adversary forces. Amphibious operations are central to this concept.

Amphibious Assault Ships

The two *Canberra*-class amphibious assault ships (LHD) (*Canberra* and *Adelaide*) have increased the amphibious and sea-lift capability of the ADF. Each of these vessels can carry an embarked force of 1000 personnel, including troops, surgical team, embarked flight personnel and headquarters staff. They can embark eight medium helicopters, which operate from six spots over the length of the flight deck. Up to 18 helicopters can be transported in the hangar and contiguous light vehicle deck, however this is at the expense of vehicle carriage. Troops and equipment can be embarked, or landed, via the floodable well dock, which accommodates four LHD landing craft (LLC). The sheltered dock allows for a much quicker load and launch in rough seas. A mix of light and heavy vehicles (including main battle tanks) can be carried on two vehicle decks, with the contiguous light vehicle deck and hangar allowing flexibility of use. A ramp connects it with the heavy vehicle deck which is adjacent to both the dock and has magazine/storeroom access.

Despite their size, the LHDs have a relatively shallow draught that enables operation in shallow waters. The LHDs are diesel-electric ships with podded propulsion. High-voltage power is transformed down to drive azimuth thruster pods which provide exceptional manoeuvrability and allow these vessels to operate without tugs.

Landing Ship Dock

HMAS *Choules* is a *Bay*-class landing ship dock (LSD). She has a substantial carrying capacity, including 356 troops under normal conditions and up to 700 for short durations. The ship is capable of carrying up to 32 main battle tanks and 150 light trucks. Vehicles can be landed ashore from the well dock via LCM8, Mexeflote (naval lighterage equipment) or by using a roll-on/roll-off (Ro/Ro) shore facility. Like the LHDs, *Choules* is fitted with a podded propulsion system. A dynamic positioning capability allows it to hold its position relative to sea swell and geographic location for extended periods without anchoring

Choules has a large flight deck that can operate two helicopters at any one time. The Mexeflotes are modular systems that can be assembled 'in-water' alongside the ship, configured as barges, causeways or pontoons. They are carried hinged to the ship's sides. Raised by winches, they can be self-propelled by two manually controlled large diesel outboard engines. Troops can be put ashore by helicopter or by various landing craft operating from the internal well dock.

Other Landing Craft

The Australian Army operates LCM 8s, which can carry small quantities of vehicles/equipment, bulk fuel, a shipping container, or up to 200 troops in ship-to-shore operations. The Army also operates the Lighter Amphibious Resupply Cargo (LARC), which is capable of carrying cargo across the shore and beyond the beach and can deploy directly into the water from the well dock of the amphibious ships.

Future Ocean Going Landing Craft

There is a current joint project to acquire new heavy landing craft, with improved ocean going capabilities, to transport armoured vehicles, conduct small scale regional amphibious operations and support the LHDs as part of an amphibious task group.

Amphibious Vessel Load Planning

The load plan of amphibious vessels will often vary. In consultation, the Amphibious Task Force and Landing Force staffs control the distribution of personnel, vehicles and equipment across the amphibious force based on parameters of priority for offload in the assault, ship suitability, total space available and the means of transfer ashore. Generally the LHDs are orientated toward airmobile operations and have a greater personnel carrying capacity whereas *Choules* is orientated toward heavy vehicle lift. Therefore *Choules* may be loaded with armoured vehicles, combat engineer and logistics heavy vehicles instead of light vehicles and troops.

Capabilities

Amphibious ships are designed primarily to conduct combat operations from the sea and their armament is limited to self-defence. Their three primary tasks are maritime mobility (sea-lift), amphibious operations, and support to operations ashore. In addition to their military functions, amphibious ships also contribute to a range of constabulary and diplomatic tasks.

The amphibious force is able to carry a medium-weight combined-arms battle group, headquarters staff, surgical team, and capability enabling elements of up to 2200 personnel together with their vehicles, heavy equipment and stores.

The amphibious vessels are relatively economical in personnel requirements and capable of carrying large quantities of vehicles and equipment which are too bulky for other transport means. The larger multi-spot flight decks of the LHD allow the launch of greater numbers of helicopters, putting more combat weight on the ground at any one time. This improves the sortie generation rate and allows operations in poor weather and lower visibility.

Embarked Helicopters

The MRH-90 maritime support helicopter is designed to operate from ships and may be quickly prepared for flying and stowage. However, it lacks the automatically folding rotor blades which are standard features of modern maritime helicopters thus retaining a degree of personnel risk and reduced flexibility in complex flight-deck management. The Tiger armed reconnaissance helicopter was not designed for maritime operations, but its smaller size makes deck management more achievable.

The Chinook heavy lift helicopter is able to lift artillery and manage the larger troop and medical lift requirements. The Chinook may be stowed in the hangar but this requires removal of rotor blades which is a difficult activity at sea. As such the Chinook is normally stowed on deck except for deep maintenance activities.

AFLOAT SUPPORT FORCE

The Afloat Support Force enables the Fleet to operate with more flexibility and at greater range from their operating ports, by increasing time at sea and reducing dependence on port visits to obtain the necessary logistic support.

Existing Capability

The afloat support force consists of a replenishment vessel and fleet tanker. The replenishment vessel, *Success*, is a multi-purpose support ship capable of providing fuel, water, ammunition, stores and fresh/frozen provisions to ships or units either at anchor or while underway. It can carry a maritime support helicopter to assist with the transfer of stores and personnel. *Success* is capable of carrying nearly 9000 tonnes of diesel fuel, 1000 tonnes of aviation fuel and 115 tonnes of water. She also has capacity for more than 150 cubic metres of provisions, 250 cubic metres of munitions including missiles and torpedoes, and 184 cubic metres of general stores and spare parts. 5000 tonnes of diesel fuel equates to about six complete FFG refuels or eight FFH refuels; while 1000 tonnes of aviation fuel equates to approximately 400 helicopter refuels.

The fleet tanker, *Sirius* is configured to provide fuel and water, but has limited capacity for the carriage of food and stores, and no capacity to carry ammunition as cargo. *Sirius* has a flight deck but no hangar and can only conduct helicopter vertical replenishment tasks, which can be used to transfer solid cargo and personnel. It is capable of carrying more than 25,000 tonnes of diesel fuel and 4700 tonnes of aviation fuel. This equates to refueling 30 FFGs or 42 FFHs, plus more than 1500 helicopter refuels. *Success* and *Sirius* are expected to be replaced by two new multi-role replenishment vessels within the next five years.

Logistic Support

The primary operational contribution of the afloat support force is the delivery of logistic support to surface combatants and other ships while they conduct combat operations at and from the sea. The effectiveness of warships is enhanced by providing logistic resupply in the area of operations, allowing surface combatants and amphibious forces to prolong operations, or extend their range and endurance (see Figure B-1).

The operational situation may require the provision of a dedicated replenishment vessel to a naval task group. Multi-role replenishment vessels are optimised for this role due to their higher speed, diversity of cargo and capacity for 24-hour underway replenishment-at-sea operations. Underway replenishment can be conducted at sea using special purpose transfer rigs for bulk liquids and solids or using helicopters and boats for the movement of personnel and smaller cargoes. The combination of these methods can be adjusted and tailored to meet the specific operational circumstances and to minimise any disruption to the combat readiness of the customer vessel.

During replenishment at sea, the receiving and supplying vessels are constrained in their ability to employ weapons and sensors, and to manoeuvre. Replenishment vessels and the procedures for transfer of cargoes are designed to minimise the time taken to conduct replenishment. As chartered tankers are not optimised for naval operations specialised military replenishment vessels are the preferred option. Size is a factor as the larger replenishment vessels are able to provide support to major ships such as destroyers and frigates. Smaller support vessels are more appropriate for landing craft, patrol boats and hydrographic ships. Alternatively smaller vessels can raft up to larger ones to obtain logistics support if required. Currently, submarine refuelling at sea is not undertaken.

Afloat support ships are capable of supporting other ADF force elements ashore, noting there are current limitations in the ability to transfer bulk liquids. Maintenance of the logistic base at sea (i.e. sea basing) reduces the requirement for establishing vulnerable fixed or temporary depots on shore and the associated requirement for supporting troops to operate and guard them. The use of afloat support vessels in this manner is expected to grow over time as the ADF increases its expeditionary capability. Other supporting vessels can be employed on resupply missions to move bulk supplies into theatre and from one patrol station to another. The scarcity of multi-role military replenishment vessels makes this type of tasking more appropriate for a non-specialised tanker or commercial vessels chartered for Government service. The loss of replenishment vessels through combat action would seriously effect operations both at sea and ashore.

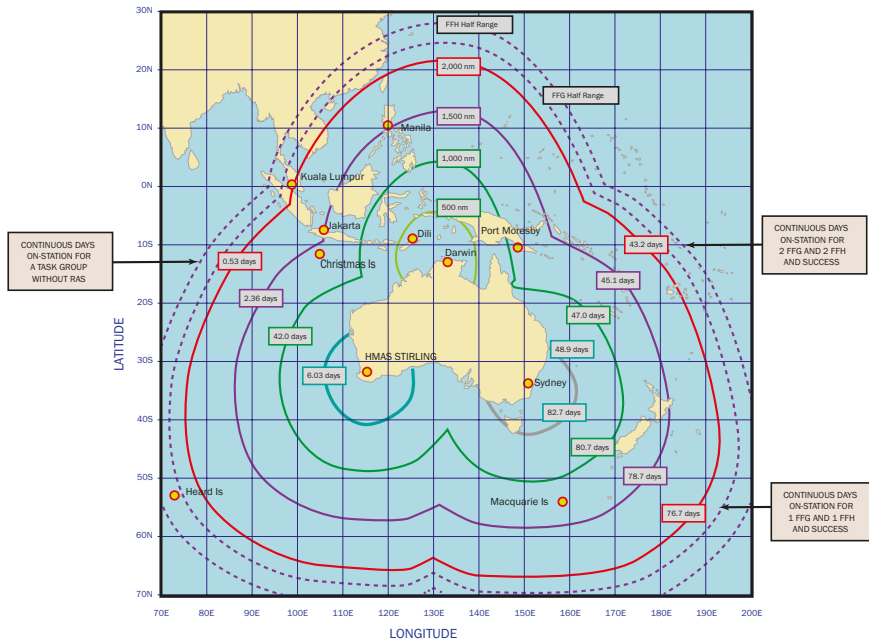


Figure B-1: Extended Range and Endurance for Surface Combatants with Afloat Support



Annex C - The Mine Warfare, Clearance Diving, Hydrographic, Meteorological and Patrol Force

The Mine Warfare, Clearance Diving, Hydrographic, Meteorological and Patrol Force is the amalgamation of the various minor war vessels with specialist tasking. Although these vessels are generally employed in specialist roles they conduct other tasks as required. Their principal roles include:

- surveillance, patrol and response
- surface detection and interception
- operational boardings
- maritime search and rescue
- humanitarian assistance and disaster relief
- environmental and scientific research support.

MINE WARFARE AND CLEARANCE DIVING FORCE

Mine Counter Measures Ships and Units

The RAN employs the following ships and units in the conduct of Mine Counter Measures (MCM).

- **The Deployable Commander Mine Warfare and Clearance Diving Task Group.** This is a deployable headquarters capable of planning and executing MCM operations from either a sea- or shore-based headquarters: it includes the Mine Warfare Command Support System. This task group regularly conducts training exercises in Australia and overseas.
- **Huon-Class Coastal Mine-hunters (MHC).** The six *Huon*-class vessels are capable of conducting mine-hunting and minesweeping operations to a maximum depth of 200 metres. They also carry RAN clearance divers.
- **Clearance Diving Teams.** The two permanent diving teams have the ability to locate, identify, dispose of and exploit mines in shallow and very shallow water areas. A third diving team can be formed and deployed for specific military operations if required. They can be employed in advance force operations, port and wharf clearances and in support of MHC operations. They possess specialist diving, salvage, demolition and explosive ordnance disposal (EOD) skills that can be used in other operations such as:

- underwater and land-based EOD and improvised explosive device disposal
 - support to amphibious operations by undertaking landing site reconnaissance and survey, landing site sea mine and obstacle survey, and clearance in very shallow waters
 - contributing to advanced force operations such as interdiction and diversion
 - undertaking other specialist diving operations such as placing and recovery of underwater sensors, and countering offshore maritime counter-terrorism
 - limited underwater battle damage hull patching and repair/salvage to assist a damaged ship to return to a support facility for more comprehensive repairs.
- **Naval Reserve diving support.** The naval reserve diving has a limited number of diving and salvage capable personnel that can be used to supplement or backfill diving team roles when the latter are deployed.
 - **Operational support unit.** This unit provides analysis of operations, evaluation of effort, intelligence and forward-based logistics support to deployed MCM forces.
 - **Naval Reserve mine warfare groups.** These two groups have the ability to supplement headquarters staff, support mine sweeping operations and provide additional personnel to the Operational Support Unit.

Sea Mining Operations

Although the ADF does not currently have an offensive mining capability, the advantages of employing sea mines include:

- engaging an adversary at minimal risk and cost
- engaging an adversary with a covert weapon that maintains a continuous threat
- forcing an adversary to operate both military and commercial shipping in areas that make them more vulnerable to other weapons
- forcing an adversary to maintain an MCM capability
- presenting an adversary with a significant psychological threat.

The disadvantages of employing sea mines include the dangers to neutral or friendly shipping, as well as the requirement, under international law, to dispose of all mines at the conclusion of a conflict.

There are two main categories of sea mines, which can be further subdivided by their method of operation and actuation:

- **Moored Mines.** Laid in water depths of down to 300 metres, these are positively buoyant and attached to the seabed, floating at a pre-determined depth below the sea surface.
- **Ground Mines.** Laid in water depths of down to 200 metres against surface shipping or 300 metres against submarines, these are negatively buoyant, resting on the seabed.

The diversity of sea mine types available to an adversary means that the planners of MCM operations must consider a number of different approaches. MCM operations involve minesweeping and mine hunting and may be offensive or defensive in nature.

Each year diving teams respond to a variety of EOD taskings around Australia and the South West Pacific region as a result of the discovery of mines and other ordnance from WWII.

Limitations

The effectiveness of the MCM effort is expressed in terms of percentage clearance and reduction of risk to vessels entering the cleared waters. Therefore a balance of the risk that is acceptable to a commander, the level of clearance required to reduce risk and the time taken to achieve that clearance level influences maritime operations.

In some cases the required level of clearance may not be achievable in the time available. Commanders must make a decision to either accept the higher risk or extend the time allowed for clearance operations. In making these assessments the following constraints should be taken into account:

- **Buried mines.** It is difficult to detect buried mines, although research into synthetic aperture sonar imaging is expected to address this issue.
- **Surf zone mines.** Surf zone clearance capability remains extremely limited and vulnerable to environmental factors, resulting in increased risk.
- **Self-Protection.** Since MCM units have a limited self-protection capability their defence must always be considered.
- **Speed.** In clearance operations, the requirement to ensure full coverage and achieve a high probability of mine clearance limits MCM vessels to low speeds, limiting the size and number of operations that can be conducted.
- **Tempo.** MCM vessels carry small crews. As most evolutions involve the whole crew, extended operations must be carefully planned to allow for crew rest and systems maintenance. Additionally the small size of MCM vessels means they cannot perform their primary function above Sea State 4, which means operations may be delayed by increased sea states.
- **Clearance Diving.** Diving operations present their own limitations and, amongst other considerations, planners must take into account sea state, tidal effect, decompression routines, emergency procedures and the operating environment.

- **Logistics.** A sound logistics infrastructure is required to support deployed MCM forces. In addition to the provision of repair facilities, stores, provisions and fuel the ships will require regular re-supply of mine disposal charges.
- **Simultaneous Operations.** The RAN has limited MCM assets, and is restricted in its capability to conduct simultaneous, geographically dispersed operations in Australian waters and offshore territories.

HYDROGRAPHY, METEOROLOGY AND OCEANOGRAPHY BRANCH

The Australian Hydrographic Service (AHS) is currently the national hydrographic authority and is responsible for the provision of hydrographic products and services required to meet Australia's obligations under the International Convention for the Safety of Life at Sea (SOLAS). The AHS has a dual role in supporting both Defence and civilian mariners.

The Hydrographic Branch of the RAN was established on 1 October 1920. The statutory basis for the AHS flows from a 1946 government decision that the RAN should continue to be the charting authority for hydrographic surveys in Australian waters and in Australia's spheres of influence in the Pacific (i.e. Papua New Guinea). This responsibility was confirmed following the 1988 Richardson Review of Commonwealth mapping and charting activities.

As a result of the Richardson Review the government confirmed the RAN would be responsible for all Commonwealth hydrographic surveying, and nautical charting functions, and that these functions would be carried out by the AHS. The *Navigation Act 2012*, which came into effect in July 2013, articulated this specific SOLAS obligation in domestic legislation and reaffirmed the RAN's responsibility to provide hydrographic services through the AHS.

The AHS comprises the Hydrographic Survey Force (HSF) which includes six hydrographic survey vessels, one aircraft and four deployable survey units within Fleet Command and Joint Operations Command. Hydrographic officers and sailors of the AHS are trained at the RAN Hydrographic School (located at HMAS *Penguin*). The AHS includes the Australian Hydrographic Office (AHO) which is responsible for the production, maintenance and distribution of all hydrographic products and services. This includes nautical charts, sailing directions, tide-tables and a regular update service for these products.

On 1 July 2016, as a key outcome of the First Principles Review, the AHO became part of the Australian Geospatial-Intelligence Organisation (AGO) but remains geographically located in Wollongong, NSW. The consolidation of the AHO into AGO enables Defence to deliver more effective and efficient hydrographic services. This ensures that the AHO is capable of meeting Defence's growing demand for maritime geospatial intelligence as well as the increasing national and international demands for nautical charts and other hydrographic services. With the consolidation of all geospatial information functions into the AGO, the AHS remains a significant part of Defence's future geospatial enterprise.

The development and execution of the national surveying and charting program, known as Hydroscheme, is a shared responsibility between AGO and the RAN. While the AHO is responsible for the collation and publication of Hydroscheme, the RAN remains responsible for the sustainment and operation of the HSF. The HSF is directed, by Navy, to undertake hydrographic and oceanographic data collection operations in support of both the national and Defence hydrographic program. The AHO represents Australia at various national and international fora, including the International Hydrographic Organization and works closely with the Australian Maritime Safety Authority (AMSA) to determine national priorities for survey and charting activities in support of safe navigation in Australian waters.

The AHS comprises several components that work collectively to ensure it achieves its mission to provide hydrographic, meteorological and oceanographic services for the nation and maritime Military Geospatial Information required to support whole of Defence and ADF operations.

Maritime Military Geospatial Information

The key military role of the AHS is to acquire and manage foundation and operational maritime information and to produce and deliver maritime military geospatial information and services to:

- provide information superiority in understanding the maritime domain
- enable Defence assets to operate safely and effectively
- exploit the above and below water physical conditions for strategic, operational and tactical advantage.

This requires the capability to conduct Rapid Environmental Assessment (REA) of the maritime domain which includes the effective acquisition, management, production and distribution of foundation and operational hydrographic, oceanographic and meteorological information. All forms of warfare benefit from a comprehensive knowledge and understanding of the maritime domain. This not only provides an essential basis upon which friendly forces can be deployed, but provides an equally valuable insight into the operational constraints faced by an adversary.

Meteorology and Oceanography

The Operational Meteorology and Oceanographic Centre located at Garden Island in Sydney, provides significant meteorological and oceanographic support to the ADF. Officers specialising in meteorology and oceanography are employed across a variety of important functions, including aviation and maritime weather forecasting, training and operational support.

Mobile teams comprising one or more maritime geospatial officers can be deployed both ashore and afloat as required. They can be deployed for the duration of an operation or exercise to provide in-situ support to command, and add to the forecasts and products provided by other forecasting centres.

The Naval Air Station Weather and Oceanography Centre (NWOC) provides aviation forecasting and tactical support at HMAS *Albatross* in support of Fleet Air Arm activities in the Eastern Australian Exercise Area. The NWOC also provides aviation meteorological products and advice to support the Army's Parachute Training School, and meteorological and oceanographic products and advice to support small boat operations in and around Jervis Bay.

Deployable Geospatial Support Teams

Deployable Geospatial Support Teams (DGST) provide operational geospatial support to deployed units including the provision of bespoke geospatial products required to support the Commander Australian Amphibious Task Group. Two operational DGSTs are based at HMAS *Waterhen* in Sydney. In addition, each of the crews embarked in HMA Ships *Leeuwin* and *Melville* have an embedded DGST that are available to deploy as required. The primary role of the DGSTs is to provide a deployable survey capability that can be available at short notice to conduct REA in support of ADF operations and exercises. A DGST is normally comprised of five members equipped with portable survey equipment and processing systems that can undertake surveys and data collection operations. DGSTs also conduct operations around the Australian coast on an opportunity basis. A DGST may also deploy to Antarctica during the summer season in support of the Australian Antarctic Division survey and science program.

Survey Ships

Two *Leeuwin*-class hydrographic ships based in Cairns provide the RAN's coastal and offshore hydrographic survey capability. They are optimised for high-performance data acquisition throughout Australia's charting area of responsibility and are equipped with multi-beam echo sounders designed for enhanced feature detection in water depths of between 20 and 200 metres. They are also equipped with a single beam echo sounder that can gather data in depths exceeding 5000 metres.

As well as their primary role of conducting hydrographic surveying in support of nautical charting, these ships have a number of complimentary roles and capabilities. These include:

- use of precise navigation to lead fleet units through minefields
- acquisition of beach intelligence
- survey of boat lanes, anchorages and beach approaches for amphibious operations
- a significant fuel capacity providing long endurance
- the ability to refuel other minor war vessels
- ample refrigerator, freezer, hold and storage capacities
- suitable cranes for cargo movement
- office space that can be occupied by an embarked command team such as a Mine Warfare or Advance Force Commander
- a flight-deck that can be used by small helicopters.

Each ship carries three survey motor boats (SMB) that are capable of conducting shallow water surveys independently of the host ship. The SMBs provide inshore hydrographic survey capability and each is fitted with an integrated hydrographic survey system utilising multi-beam echo sounder and side scan sonar technologies designed for enhanced feature detection in water depths between 5 and 50 metres.

The SMBs, and any embarked helicopters, provide additional logistic and operational flexibility to a force.

Survey Motor Launches

The *Paluma*-class Survey Motor Launches (SML) provide the RAN's inshore hydrographic survey capability. Also based in Cairns, each of the four SMLs are crewed by 14 personnel. They are fitted with multi-beam echo-sounders which are optimised for high-performance maritime geospatial information acquisition in coastal waters, particularly in water depths between 10 and 70 metres. The ships usually operate in pairs and carry a light utility boat that can operate in shallow or confined areas.

The SMLs can also be called upon to support tactical operations such as:

- MCM support in the form of shallow water or port surveys
- seabed search and classification
- precise navigation to lead fleet units through minefields
- acquisition of beach intelligence
- survey of boat lanes, anchorages and beach approaches for amphibious operations.

Laser Airborne Depth Sounder Flight

The Laser Airborne Depth Sounder (LADS) system, which is currently installed in a civilian de Havilland Dash 8 - 200F aircraft, is optimised for rapid data acquisition in relatively clear water to depths down to approximately 70 metres. The LADS Flight is based in Cairns, and is able to perform rapid surveys over large areas. It is capable of surveying very shallow or dangerous waters not easily accessible by ships or boats, and can operate independently from remote airfields. The aircraft is crewed by civilian pilots and maintained through a civilian maintenance contract, but RAN hydrographic specialists operate the system to collect and conduct initial processing of data. The LADS aircraft has no self-protection capabilities and is registered on the civil list and therefore can only operate in a benign environment.

Limitations

Hydrographic vessels can operate at peak survey performance in conditions up to Sea State 3; although they can operate at slightly higher sea states but with reduced data quality and data collection efficiency. Hydrographic vessels have no significant self-protection capability and operate at minimum crew levels which can impact on sustained operations. Appropriate force protection would be required for these vessels to conduct tactical survey and military geographic information collection operations in a hostile area.

PATROL FORCE

The patrol force provides Australia's primary surface response capability for civil law enforcement and coastal surveillance operations. It is currently tasked to be available for 3500 days per year; much of which is dedicated to civil surveillance.

The 13 *Armidale*-class patrol boats are cost-effective assets. They are capable of surface surveillance and interdiction, support to land forces, and conducting concurrent multiple boardings for limited periods in a low-threat environment. With a draft of approximately 2.5 metres, patrol boats can operate within much of the shallow waters around Australia's coastline and region. Patrol boats can provide an electronic surveillance capability, in addition to providing intelligence and warning as required. When and as required, naval personnel have crewed leased ABF patrol vessels, and other vessels, to augment the numbers of *Armidale*-class patrol boats. In such cases the vessels are known as an Australian Defence Vessel (ADV).

In comparison to major surface combatants, patrol boats represent a relatively low-cost alternative for the projection of national power. Specifically, in low-threat conditions, patrol boats can be useful in regional situations where Australia does not wish to increase diplomatic tension. A project is now underway to replace the *Armidale*-class patrol boats with a large offshore patrol vessel in the foreseeable future.

Military Tasks

Patrol boats contribute to military operations through:

- limited intelligence collection and surveillance
- limited maritime strike and interdiction
- defence of chokepoints
- support to land operations.

Constabulary Tasks

Patrol boats contribute to the enforcement of Australian sovereignty in its maritime zones through:

- environmental and resource management and protection
- interception of illegal maritime arrivals
- bio-security (quarantine) operations
- aid to civil authorities (such as search and rescue)
- drug and weapons interdiction
- counter-piracy operations.

Diplomatic Tasks

Patrol boats can conduct operations such as:

- assistance to allied and friendly navies
- presence
- peace operations
- humanitarian aid and disaster relief
- permissive and non-permissive non-combatant evacuation operations.

Patrol boat crews are trained to conduct low-level non-combatant evacuation operations or to assist a larger evacuation task.

Limitations

The principal limitations of patrol boats are:

- **Environmental Conditions.** Patrol boats are normally limited to operations in less than Sea States 4-5, and experience difficulty in conducting boarding operations in seas exceeding 2.5 metres.
- **Range/Endurance.** Fuel capacity and provisions storage limit the range and endurance of patrol boats.
- **Crew.** Most evolutions involve a significant number of the 20-25 personnel aboard a patrol boat. High-intensity operational periods must be interspersed with adequate opportunities for crew rest.
- **Self-protection.** The stabilised 25mm gun provides a limited offensive and defensive capability.





Annex D - The Naval Aviation Force

Modern warships can project force over an extended area, yet the range at which targets may be detected and identified with ship-borne sensors remains limited. Operating as an integral or independent component of a ship's weapons and sensor suite, naval helicopters extend detection ranges, maximise offensive ranges and reduce vulnerability to surprise attacks.

Maritime combat helicopters, such as the MH-60R Seahawk, may be fitted with radar, active and/or passive sonar, magnetic anomaly detection, electro-optical/infra-red cameras, data links electronic support measures and a range of ASuW and ASW weapons.

The projection of force ashore, and the ability to land troops from the sea, is a critical capability for the ADF. Maritime support helicopters, such as the MRH-90, provide a substantial increase in the speed of troop and equipment delivery to a point of entry during amphibious operations. Their versatility enables rapid lodgement, re-supply and casualty evacuation.

Helicopters are not limited to shoreline delivery, thereby providing more options for the amphibious commander. Stores and equipment may be transferred inland via under-slung external loads. Stores, equipment and personnel may also be carried inside the helicopter and moved some distance inland.

Helicopters, whether operating on military/civilian support tasks, flying from a ship or airfield, can face a range of threats related to the operational environment. This includes extremes in weather, as well as dangers posed by low flying and the risk of mechanical failure.

Trials of different types of ship-launched UAV systems and platforms have been conducted and the future use of UAV's at sea is progressing and will become a routine activity for the RAN. The RAAF currently operates UAVs and intends to acquire the Triton UAV for use with its maritime patrol aircraft to provide an enhanced maritime surveillance capability.

Military Tasks

Helicopters can perform a range of military roles in support of maritime operations. These include:

- **Surface warfare.** Using the suite of sensors including visual search, a maritime combat helicopter can detect, track, classify, identify and attack surface contacts in both the open-ocean and littoral, usually outside or at the limit of the opposing force's weapon coverage.

- **Undersea warfare.** Submarines pose one of the greatest threats to surface ships, due in part to the difficulty of detecting them using ship-based systems. Helicopters are equipped with a range of advanced sensors and weapons that aid in the detection, tracking, classification, identification and prosecution of submarines beyond the threat of modern submarine-launched torpedoes. Naval helicopters can detect mines on or near the surface before they become a threat to a task group. Helicopters can also deliver clearance divers to neutralise or destroy the mines.
- **Amphibious warfare.** All helicopters have the ability to carry both personnel and cargo, but may need to be reconfigured to carry the maximum possible load. The MRH-90 can provide a rapid over-the-shore capability for movement of personnel and equipment during amphibious operations.

Constabulary Tasks

Helicopters are also suited to support a range of constabulary operations:

- **Sanctions and embargoes.** Over recent decades the RAN has played a significant role in the visit, board, search and seizure of shipping within the Middle East Region. Maritime combat helicopters provide early detection of suspect vessels and are flexible enough to quickly transition to provide support to boarding parties. They can also provide electro-optical/infra-red datalink pictures directly to the boarding party, and command, while providing force protection using a range of weapons. The ability to insert a boarding party from a maritime support helicopter remains an option for the commander.
- **Defence force aid to the civil authority.** Helicopters are suitable in the support of civil authorities. Support to border protection operations to prevent drug, weapons or people smuggling, and illegal fishing are among operations that have been conducted in the past.
- **Search and rescue (SAR).** The embarked systems and versatility of helicopters are also valuable for SAR. Helicopters have been frequently used in the past to support both military and civilian search efforts. The Seahawk and MRH-90 are highly-capable search units over both land and water. They are fitted with rescue winches that provide a rescue capability where landing is not practicable, such as over water or dense forest.

Diplomatic Tasks

In addition to their primary military role, RAN helicopters provide useful support to peacetime military activities:

- **Defence assistance to the civil community.** The personnel and cargo carrying capabilities of naval helicopters coupled with their ability to operate from relatively small unprepared sites make them suitable to support HADR activities both within Australia and overseas.

Limitations

Helicopters are suited to a broad range of tasks across the spectrum of operations, but they also possess a number of limitations which must be considered:

- **Range, endurance and availability.** The individual and cumulative flight hours available over a period are limited by the endurance and number of helicopters, the embarked aircrew, maintenance staff as well as the number of ships available to support them. RAN surface combatants, on deployment overseas, will normally carry a helicopter. During higher-level operations additional helicopters and/or crews may be carried depending on hangar and deck space.
- **Sustainability.** Helicopters require regular maintenance, a demand that increases with the number of hours flown. Some maintenance procedures, such as placing the aircraft on jacks, can be hazardous on a moving deck and are, in all but the most extreme cases, conducted while the ship is in port. Surface combatants only carry limited stores thus sustaining a naval helicopter presence during high-tempo operations can be a challenge for the logistics system.
- **Cost/Technology.** Maritime combat helicopters are sophisticated and technologically advanced machines. This translates to an increased complexity in systems requiring higher levels of maintenance equipment and skilled maintenance personnel; leading ultimately to fewer helicopters and aircrew. Sustaining multiple and concurrent operations poses challenges when planning operations.



Annex E - The Shore Force

A separate Shore Force was established in 2013 to deliver shore based capability for the RAN. The key roles of the Shore Force are:

- command all commissioned RAN establishments and Regional Headquarters
- maintain assigned capability including:
 - workforce
 - facilities and infrastructure
 - garrison support
 - airworthiness preparedness for airfield operations
 - seaworthiness preparedness of port operations.
- management of the relationship with the Estate and Infrastructure Group at the regional level on behalf of the Fleet Commander
- support the Australian Navy Cadet organisation in each state.

The Shore Force delivers the support required to raise, train and sustain the Fleet and aircraft for maritime operations. An overview of the establishments and associated units is provided below.

Additionally included in the Annex is a brief description of the support vessels operated by DMS Maritime that provide substantial support to the RAN as a contracted service.

COMMISSIONED ESTABLISHMENTS

Major Fleet Bases

HMAS *Kuttabul*. Located at Potts Point, Sydney, *Kuttabul* is the largest commissioned naval establishment in Sydney. It is located within the Garden Island Defence Precinct which is also the home port for major fleet units (known as Fleet Base East) and the location of Fleet Headquarters. *Kuttabul* is responsible for the personnel and administration of the following units/organisations:

- ADF Investigative Service - Joint Investigation Office Sydney
- Amphibious and Afloat Support Group
- Amphibious and Afloat Support System Program Office
- Anzac Class Systems Program Office - Eastern Australia
- Australian Maritime Warfare Centre

- Chaplaincy Centre
- Combat Systems Maintenance School
- Command & Intelligence Systems Support Office - Sydney
- Commander Individual Training
- Defence Communications Station - Sydney
- Directorate Maritime Sustainment Support - East
- Director of Music and Ceremonial - Navy
- Eastern Region - Alcohol & Drug Program Coordinator
- Fleet Clothing Store
- Fleet Dental Department
- Fleet Headquarters
- Fleet Information Systems Support Office (Administration Annex)
- Fleet Support Unit – South East
- FFG System Program Office
- FFG System Program Office - Warfare Systems Support Centre
- Homebush & North Strathfield Living In Accommodation Precincts
- Joint Command Health Centre
- Joint Data Management Unit
- Legal Advocacy and Counselling Service
- Maritime Safety Bureau
- Maritime Trade Organisation & NSW Detachment National Operations Support Centre
- National Port Services Organisation (Master Attendant)
- Naval Heritage Centre (Garden Island) and collection (Spectacle Island)
- Navy Imagery Unit - East
- Navy Indoor Sports Centre
- Navy People Career Management Agency - East
- Navy Psychology - Eastern Australia
- Navy Technical Training Unit - East
- Operational Meteorology and Oceanographic Centre
- Personnel Support Unit - National and NSW
- Port Services Manager East (Command Centre)
- Port Services Manager Sydney

- RAN Band - Sydney Detachment
- RAN Test, Evaluation and Analysis Authority
- Regional Information and Communications Technology - Joint Intelligence Support System
- Reserve Regional Pool Manager - NSW
- Sailors Leadership and Management Faculty-East
- Surface Forces Logistics Operations Cell
- Surface Forces Command
- Surface Forces Personnel Management
- Young Endeavour Youth Scheme.

HMAS *Stirling*. Also known as Fleet Base West, *Stirling* is located on Garden Island at the southern end of Cockburn Sound (approximately 50 kilometres south of Perth). It is the home port for the RAN submarine fleet as well as various major fleet units. Located on-site are:

- *Anzac*-class Systems and Training Centre
- Australian Clearance Diving Team Four
- Australian Submarine Squadron Headquarters
- *Collins*-class Submarine Systems and Training Centre
- Defence Fuel Installation (Maritime)
- DSTG Maritime Operations Research Facility
- Fleet Support Unit - West
- Health Centre - *Stirling*
- Helicopter Support Facility
- Joint Logistics Unit – West
- Personnel Support Unit - WA
- Port Services
- Submarine Escape and Rescue Centre (including the Submarine Escape Training Facility)
- Torpedo Maintenance Facility
- Training Authority - Submarines
- Training Centre West.

Note: The Lancelin Naval Gunfire Support Range is administered by staff from *Stirling* and E & IG personnel.

Other Fleet Bases

HMAS Cairns. Located on Trinity Inlet at Cairns in Queensland, *Cairns* is the home port to four *Armidale*-class patrol boats, the RAN hydrographic fleet of two hydrographic ships, four survey motor launches, and the Laser Airborne Depth Sounding Flight. Other units at *Cairns* include:

- Defence Fuel Installation (Maritime)
- Fleet Logistic Support Element – Cairns
- Fleet Support Unit North East
- Hydrographic Group
- Hydrographic Systems Program Office
- Minor War Vessel – Sea Training Unit
- Element of the Patrol Boat Systems Program Office
- Personnel Support Unit - North QLD
- Port Services.

HMAS Coonawarra. Located at Larrakeyah Cove, Darwin, *Coonawarra* is the main home port for *Armidale*-class patrol boats and other lodger units including:

- Fleet Support Unit – Darwin
- HQ Patrol Boat Group
- Elements of the Joint Logistics Unit – North
- Patrol Boat Systems Program Office
- Personnel Support Unit - NT.

HMAS Waterhen. Located at Waverton on Sydney's north shore, *Waterhen* is home to the Mine Warfare and Clearance Diving Group. It is the home port for the six *Huon*-class mine-hunters. Also located on-site are the:

- Australian Clearance Diving Team One
- Deployable Geospatial Survey Team
- Fleet Support Unit (South East) - *Waterhen*
- Health Centre - *Waterhen*
- LHD Landing Craft School
- MCM Group
- MCM Systems Program Office
- Mine Warfare Faculty

- Mine Warfare Geospatial Deployable Systems Team
- VIP Boat Squadron.

Air Bases

HMAS Albatross. Located near the town of Nowra in NSW, *Albatross* is the Navy's only operational airfield and is home of the Fleet Air Arm (FAA). It is also known as the Naval Air Station Nowra (NAS Nowra). Apart from housing HQ FAA, all Naval Air Squadrons, the Aircraft Maintenance and Flight Trials Unit and aircraft simulators, the establishment also supports the following resident units:

- Australian Joint Acoustic Analysis Centre
- Fleet Air Arm Museum
- Fleet Logistic Support Element - HQ FAA
- Health Centre - *Albatross*
- Joint Logistics Unit - East (Nowra)
- Naval Aviation Systems Program Office
- Parachute Training School (Army)
- Personnel Support Unit - Shoalhaven
- RAN Tactical Electronic Warfare Support Section
- Training Authority - Aviation
- 453 Squadron Nowra Flight (RAAF) - air traffic control services.

A satellite airfield at nearby Jervis Bay is owned by Navy and administered through the Airfield Coordination Centre at *Albatross*.

Training Establishments

HMAS Cerberus. Located at Crib Point, on the Mornington Peninsula in Victoria (about 70 km south of Melbourne), *Cerberus* is the Navy's largest training establishment. The commanding officer of *Cerberus* is also the Director Training Authority - Engineering. Other lodger units include the:

- ADF Physical Training School
- Recruit Training School
- ADF School of Signals - Maritime Communications and Information Wing
- Boatswains Faculty
- Engineering Faculty
- Engineering Officers Training Centre

- Health Centre - *Cerberus*
- Personnel Support Unit - Victoria
- RAN School of Survivability and Ship's Safety (RANSSSS) Training Facility - South
- Personnel Support Unit - Victoria
- RAN Training Systems School
- Training Authority Maritime Logistics & Health
- West Head Gunnery Range.

HMAS *Creswell*. Located on the shores of Jervis Bay, south of Sydney, *Creswell* is also known as the Royal Australian Naval College (RANC). The establishment hosts single service initial training for RAN undergraduates of the Australian Defence Force Academy and direct entry naval officers through the New Entry Officer's Course. Additionally, the RANC provides initial officer entry through the following training:

- Lateral Initial Entry Program
- Reserve Entry Officers Course
- University Entry Officers Course
- Warrant Officer & Senior Sailor Entry Officers Course.

The commanding officer of *Creswell* is also the Director Training Authority - Initial Training Leadership and Management. In addition to oversight of various initial training courses they are responsible for staff training delivered by the Management & Strategic Studies Faculty for promotion and leadership courses.

The RAN School of Survivability and Ship's Safety (RANSSSS) is a resident unit at *Creswell*, however it is under the command structure of Training Authority – Maritime Warfare. The RANSSSS provides practical combat survivability training in purpose built facilities for fire-fighting, floods and other emergency situations that may occur at sea.

Beecroft Weapons Range is a resident unit of *Creswell* and is the only calibrated naval gunfire support range on the east coast of Australia. The range supports a variety of gunnery activities and unit exercises.

HMAS *Penguin*. Located in the suburb of Mosman, on the north shore of Sydney Harbour. *Penguin* is a training establishment containing the:

- ADF Centre for Mental Health
- ADF Diving School
- Health Centre - *Penguin*
- Maritime Operational Health Unit
- RAN Hydrographic School

- RAN Medical School
- Submarine and Underwater Medicine Unit (including a recompression chamber facility)
- 1 Commando Company (Army Reserve)
- Pittwater Annex which is used extensively for diving and hydrographic training.

HMAS Watson. Located near Watsons Bay on South Head, at the entrance to Sydney Harbour, *Watson* is a maritime warfare training establishment with training courses conducted for:

- Combat System Operators (CSO)
- Commanding and Executive Officer designates
- Junior Maritime Warfare Officers
- Navigation Specialists
- Principal Warfare Officers.

The commanding officer of *Watson* is also appointed as the Director Training Authority - Maritime Warfare (DTA-MW) reporting to Commodore Training. The following schools at *Watson* report to DTA-MW, through a head of department, for their training output:

- School of Maritime Warfare (including the System Training School and the CSO and Electronic Warfare Schools)
- Navigation Faculty (including the Bridge Training Facility)
- School of Maritime Warfare
- Junior Warfare Application Course.

Support Bases

HMAS Harman. Located in Canberra, *Harman* hosts an ADF communication facility and also has a role as the administrative centre for Navy personnel overseas (except those on operations conducted by HQJOC and those with a local Navy Commanding Officer) and those within the Canberra region (except those personnel posted to the Australian Defence Force Academy and the Australian Federation Guard). Its lodger units include:

- Defence Communications Area Master Station
- Defence Communications Station Canberra
- Defence Information Systems Communications Establishment - ACT
- Defence Network Operations Centre
- Health Centre - *Harman*
- Personnel Support Unit - ACT
- Tri - Service Multi User Depot (MUD) supporting the following units:

- 10 Field Battery (23 Field Regiment)
- 4th Combat Engineer Squadron (5 Combat Engineer Regiment)
- C Company (4/3 Royal NSW Regiment)
- 143 Signals Squadron (8 Signals Regiment)
- 5 Combat Service Support Battalion
- 28 Squadron (Royal Australian Air Force).

HMAS Moreton. Located in the Brisbane suburb of Bulimba. This base is responsible for support to visiting RAN and foreign naval vessels, to ports south of the Tropic of Capricorn, as well as the administration/support for naval personnel posted to:

- Army Aviation Training Centre Oakey
- Defence Force School of Signals - Electronic Warfare Wing (Borneo Barracks, Cabarlah)
- Defence Intelligence Training Centre (Kokoda Barracks, Canungra)
- Deployable Joint Force Headquarters, 1st Intelligence Battalion, ADF Investigative Service, 20 Surveillance and Target Acquisition Regiment and 1st Signal Regiment (Gallipoli Barracks, Enoggera)
- RAAF Base Amberley
- Defence Force Recruiting Centres in southern Queensland
- Queensland Detachment of the RAN Band
- various civilian universities and medical facilities for officers completing undergraduate training.

Regional Headquarters

Two regional Naval Headquarters (NHQ) operate in South Australia and Tasmania. They are responsible for operational, administrative and logistic support to Navy personnel posted to their region. Naval Headquarters are also responsible for Navy community engagement, ceremonial activities, RAN Reserve coordination, Defence aid to the civil community and support to visiting RAN and foreign warships. The Naval Headquarters are:

- NHQ South Australia, located within Keswick Barracks in Adelaide. This NHQ is responsible for RAN personnel posted to the:
 - Joint Electronic Warfare Operational Support Unit, Defence Science and Technology Group, ADF Investigative Service, 92 Wing Headquarters, RAAF Edinburgh Health Centre, 3 Security Force, 87 Squadron and 1 Radar Surveillance Unit at RAAF Base Edinburgh

- Air Warfare Destroyer Alliance and Collins Submarine sustainment program at Techport Australia
 - Future Submarines program at Dudley Park
 - Joint Proof and Experimental Unit at Port Wakefield
 - Defence Force Recruiting Centre in Adelaide
 - South Australian Detachment of the RAN Band
 - various civilian universities and medical facilities for officers completing undergraduate training.
- NHQ Tasmania, located within Anglesea Barracks in Hobart. This NHQ is responsible for RAN personnel posted to:
 - Anglesea Barracks
 - Australian Maritime College - Launceston
 - Defence Force Recruiting Centre in Hobart
 - Tasmanian Detachment of the RAN Band
 - various civilian universities and medical facilities for officers completing undergraduate training.

Sail Training Ship *Young Endeavour*

This vessel was gifted to Australia by the people of Great Britain at the 1988 Bicentenary of the arrival of the First Fleet to Australia in 1788. The *Young Endeavour* flies the Australian White Ensign and is crewed by RAN personnel but is not a commissioned vessel. The Young Endeavour Youth Scheme (YEYS), based in Sydney, administers the Young Endeavour Youth Development Program. The Executive Director YEYS is responsible to the Fleet Commander for the financial management, general administration and promotion of the scheme.

DMS Maritime

Since the mid 1990's the bulk of the RAN's harbour support vessels have been provided under a commercial contract with DMS Maritime. These include water and fuel lighters, ammunition lighters, diving tenders, work boats, torpedo recovery vessels, remote control surface targets, crane stores lighters, training vessels (including sailing craft) and other small harbour water craft. In recent years the vessels operated by DMS maritime have increased in size and complexity and can include a mixed crew of contracted and Navy personnel. These include MV *Besant* (submarine intervention gear ship), MV *Stoker* (submarine rescue gear ship) and MV *Sycamore* (maritime aviation training vessel).

Abbreviations

AAR	Air-to-Air Refuelling
AAW	Anti-Air Warfare
ABF	Australian Border Force
ADF	Australian Defence Force
ADV	Australian Defence Vessel
AEW & C	Airborne Early Warning and Control
AFZ	Australian Fishing Zone
AHS	Australian Hydrographic Service
AIS	Automated Identification System
AMDC	Australian Maritime Defence Council
AMWC	Australian Maritime Warfare Centre
AMSA	Australian Maritime Safety Authority
ASW	Anti-Submarine Warfare
ASuW	Anti-Surface Warfare
ATG	Amphibious Task Group
BLOC	Baseline Level of Capability
C2	Command and Control
CA	Chief of Army
CAF	Chief of Air Force
CAP	Combat Air Patrol
CASG	Capability Acquisition and Sustainment Group
CDF	Chief of Defence Force
CIMIC	Civil Military Cooperation
CJOPS	Chief of Joint Operations
CJTF	Commander Joint Task Force
CN	Chief of Navy

CNPD	Chief of Navy Preparedness Directive
COMAUSFLT	Commander Australian Fleet
COMFAA	Commander Fleet Air Arm
COMMHP	Commander Mine Warfare, Clearance Diving, Hydrographic, Meteorological and Patrol Force
COMSHORE	Commander Shore Force
COMSUB	Commander Submarine Force
COMSURF	Commander Surface Forces
COMTRAIN	Commodore Training
COMWAR	Commodore Warfare
CPD	CDF Preparedness Directive
DCJOPS	Deputy Chief of Joint Operations
DCN	Deputy Chief of Navy
DDG	Guided Missile Destroyer
DGMAROPS	Director General Maritime Operations
DGST	Deployable Geospatial Support Team
DPR	Defence Preparedness Requirements
DSwMS	Defence Seaworthiness Management System
DSTG	Defence Science and Technology Group
DWT	Dead Weight Tonnage
EEZ	Exclusive Economic Zone
E&IG	Estate and Infrastructure Group
EOD	Explosives Ordnance Disposal
ESSM	Evolved Sea Sparrow Missile
FAS	Fleet Activity Schedule
FFG	Guided Missile Frigate
FFH	Helicopter Capable Frigate
FHQ	Fleet Headquarters

FIC	Fundamental Inputs to Capability
HADR	Humanitarian Assistance and Disaster Relief
HMAS	Her Majesty's Australian Ship
HNC	Head Navy Capability
HNE	Head Navy Engineering Regulation, Certification and Safety
HNPTAR	Head Navy People Training and Resources
HQJOC	Headquarters Joint Operations Command
HSF	Hydrographic Survey Force
IJN	Imperial Japanese Navy
ISR	Intelligence Surveillance and Reconnaissance
JOMIST	Joint Maritime Industry Support Team
JTF	Joint Task Force
LACM	Land Attack Cruise Missile
LHD	Landing Ship Helicopter / Dock
LNG	Liquefied Natural Gas
LSD	Landing Ship Dock
MBC	Maritime Border Command
MCM	Mine Countermeasures
MLOC	Minimum Level of Capability
MOC	Maritime Operations Centre
MSO	Military Support Operations
MTO	Maritime Trade Operations
MV	Motor Vessel
NAS	Navy Activity Schedule
NATO	North Atlantic Treaty Organization
NCAGS	Naval Cooperation and Guidance for Shipping
NGS	Naval Gunfire Support
nm	nautical mile

OLOC	Operational Level of Capability
PACIOSWG	Pacific and Indian Oceans Shipping Working Group
RAAF	Royal Australian Air Force
RAS	Replenishment at Sea
REA	Rapid Environmental Assessment
RMP	Recognised Maritime Picture
ROE	Rules of Engagement
SAR	Search and Rescue
SCCT	Staff Covered Continuation Training
SLOC	Sea Lines of Communication
SMB	Survey Motor Boat
SOI	Statement of Operating Intent
SOLAS	<i>International Convention for the Safety of Life at Sea 1974</i>
SONPAS	Standing Offer Naval Port Agency Service
SRAF	Sea Release Assurance Framework
STOM	Ship to Objective Manoeuvre
SUBOPAATH	Submarine Operating Authority
TE	Task Element
TF	Task Force
TG	Task Group
TU	Task Unit
UAS	Unmanned Aerial Systems
UAV	Unmanned Aerial Vehicle
UUV	Unmanned Underwater Vehicle
UN	United Nations
UNCLOS	<i>United Nations Convention on the Law of the Sea 1982</i>
WW I	World War I
WW II	World War II

Glossary

SOURCES

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AAP 1000-D	<i>The Air Power Manual (2014)</i>
ADG	<i>Australian Defence Glossary</i>
ADDP-D	<i>Foundations of Australian Military Doctrine (2012)</i>
ADDP 00.1	<i>Command and Control (2009)</i>
ADDP 00.2	<i>Preparedness and Mobilisation (2013)</i>
ADDP 00.3	<i>Multinational Operations (2011)</i>
ADDP 00.9	<i>Multiagency Coordination - Defence's Contribution to Australian Government Responses (2013)</i>
ADDP 06.1	<i>Rules of Engagement (2006)</i>
ADDP 06.4	<i>Law of Armed Conflict (2006)</i>
ADDP 2.0	<i>Intelligence (2015)</i>
ADDP 2.1	<i>Counterintelligence (2015)</i>
ADDP 3.0	<i>Campaigns and Operations (2013)</i>
ADDP 3.2	<i>Amphibious Operations (2009)</i>
ADDP 3.5	<i>Electronic Warfare (2011)</i>
ADDP 3.8	<i>Peace Operations (2015)</i>
ADDP 3.9	<i>Airborne Operations (2011)</i>
ADDP 3.10	<i>Noncombatant Evacuation Operations (2011)</i>
ADDP 3.20	<i>The Military Contribution to Humanitarian Operations (2013)</i>
ADDP 4.1	<i>Logistic Support to Capability (2014)</i>
ADDP 4.5	<i>Materiel Engineering and Maintenance (2015)</i>
ADDP 5.0	<i>Joint Planning (2015)</i>
ADDP 6.0	<i>Communication and Information Systems (2012)</i>
ADFP 06.1.2	<i>Australian Maritime Jurisdiction (2010)</i>
AMD	<i>Australian Maritime Doctrine (2010)</i>
JDP 0-01.1	<i>United Kingdom Glossary of Joint and Multinational Terms and Definitions (Eighth Edition 2011)</i>
JP 1-02	<i>Dictionary of Military and Associated Terms, USA Doctrine (2008)</i>
UNCLOS	<i>United Nations Convention on the Law of the Sea (1982)</i>

Note: Where no source is shown in brackets after the definition, the origin is this document.

Access

The ability to approach and manoeuvre to achieve military aims within a designated environment. **(AMD)**

Advance Force

A temporary organisation within the amphibious task force which precedes the main body to the objective area. Its function is to participate in preparing the objective for the main assault by conducting such operations as reconnaissance, seizure of supporting positions, minesweeping, preliminary bombardment, underwater demolitions and air support. **(AAP-6)**

Adversary

A party acknowledged as potentially hostile to a friendly party and against which the use of force may be envisaged. **(AAP-6)**

Aim (Military)

A single unambiguous military purpose that must be established before a plan can be developed at any level of command for a military operation. **(AMD)**

Air Parity

When control of the air is being contested and no forces has been able to obtain an air power advantage and /or air defence dominance over another. **(AAP 1000-D)**

Air Superiority

When operations can be conducted at a given location for the desired duration without effective interference by adversary air power and /or defence capabilities. **(AAP 1000-D)**

Air Support

All forms of support given by air forces on land or sea. **(AAP-6)**

Air Supremacy

When adversary air power and/or air defence capabilities are incapable of effective interference, unbounded by time and location. **(AAP 1000-D)**

Airborne Early Warning and Control

Air surveillance and control provided by airborne early warning aircraft which are equipped with search and height-finding radar and communication equipment for controlling weapon systems. **(AAP-6)**

Airmobile Operation

An operation in which combat forces and their equipment manoeuvre about the battlefield by aircraft to engage in ground combat **(ADDP3.9)**

Amphibious Assault

The principal type of amphibious operation which involves establishing a force on a hostile or potentially hostile shore. **(AAP-6)**

Amphibious Demonstration

A type of amphibious operation conducted for the purpose of deceiving the enemy by a show of force with the expectation of deluding the enemy into a course of action unfavourable to them. **(AAP-6)**

Amphibious Force

A naval force and landing force, together with supporting forces that are trained, organised and equipped for amphibious operations. **(AAP-6)**

Amphibious Operation

A military operation launched from the sea by a naval and landing force embarked in ships or craft, with the principal purpose of projecting the landing force ashore tactically into an environment ranging from permissive to hostile. **(AAP-6)**

Amphibious Raid

A type of amphibious operation involving swift incursion into or temporary occupation of an objective followed by a planned withdrawal. **(AAP-6)**

Amphibious Ready Group

A tactical grouping of one or more amphibious ships and their escorts for the purpose of conducting an amphibious operation.

Amphibious Task Force

A task organisation of naval forces and a landing force, with their organic aviation and other supporting forces, formed for the purpose of conducting an amphibious operation. **(AAP-6)**

Amphibious Withdrawal

A type of amphibious operation involving the extraction of forces by sea in naval ships or craft from a hostile or potentially hostile shore. **(AAP-6)**

Anti-Air Warfare

Measures taken to defend a maritime force against attacks by airborne weapons launched from aircraft, ships, submarines and land based sites. **(AAP-6)**

Anti-Submarine Warfare

Activities conducted to deny an adversary the effective use of their submarines. **(AAP-6)**

Anti-Surface Warfare

Measures taken to defend a maritime force against attacks by surface based weapons launched from ships and land based sites. **(AAP-6)**

Archipelago

A group of islands, including parts of islands, interconnecting waters and other natural features which are so closely interrelated that such islands, waters and other natural features form an intrinsic geographical entity, or which historically have been regarded as such. **(UNCLOS)**

Archipelagic Baselines

Straight lines joining the outermost points of the outermost islands and drying reefs which may be used to enclose all or parts of an archipelago forming all or part of an archipelagic state. **(UNCLOS)**

Archipelagic Sea Lanes

Sea-lanes and air routes designated by an archipelagic state that are suitable for continuous and expeditious passage of foreign ships and aircraft in their normal mode of operation through or over its archipelagic waters and the adjacent territorial sea. **(UNCLOS)**

Archipelagic State

An independent State consisting entirely of an archipelago of islands. **(UNCLOS)**

Archipelagic Waters

Those waters enclosed by archipelagic baselines drawn in accordance with Article 47 of the *United Nations Convention on the Law of the Sea, 1982*. The sovereignty of an archipelagic state extends to the waters enclosed by the baselines, regardless of their depth or distance from the coast, as well as the associated seabed, subsoil and airspace. **(ADDP 6.4)**

Area Defence

That principle of tactics where a formation is deployed to occupy an area within which it seeks to gain a tactical dominance and so weaken the enemy to the extent that offensive operations can be resumed or sustained.

Area of Influence

A geographical area wherein a commander is directly capable of influencing operations, by manoeuvre or fire support systems normally under their command or control. In maritime operations, such an area may be fixed or moving. **(AAP-6)**

Area of Interest

The area of concern to a commander relative to the objectives of current or planned operations, including their areas of influence, operations and/or responsibility, and areas adjacent thereto. **(AAP-6)**

Area of Operations

That portion of a theatre necessary for military operations and their administration as part of a campaign. **(AAP 1000-D)**

Armed Conflict

Conflict between States, or between a State and organised, disciplined and uniformed groups within a State such as an organised resistance movement, in which at least one party has resorted to the use of armed force to achieve its aims. **(ADDP-D)**

Asymmetric Threat

A threat emanating from the potential use of dissimilar means or methods to circumvent or negate an opponent's strengths while exploiting their weaknesses to obtain a disproportionate result. **(AAP-6)**

Attrition

The reduction of the effectiveness of a force caused by loss of personnel and materiel.

(AAP-6)

Availability

A measure of the degree to which a resource is in an operable or committable state.

Note that:

- a. a resource may refer to (or a combination of) personnel, materiel and/or systems;
- b. a resource can be considered as a ratio of the time that the resource is usable to the total time under consideration and is used to facilitate planning; and
- c. the percentage of the total available that are in a specific state of readiness in support. **(ADDP 4.5)**

Balanced Fleet

A naval force that can be generated and sustained with the range of capabilities required to provide the national government with the range of military options required to meet national security and military strategic goals. Inherent in the force is the flexibility to deal with both symmetric and asymmetric threats in the maritime battlespace.

Balanced Force

A military force that has all the necessary capabilities to carry out a particular mission without unnecessary redundancy. **(AMD)**

Baseline

The line from which the seaward limits of a state's territorial sea and certain other maritime zones of jurisdiction are measured. **(UNCLOS)**

Battleworthy (Maritime)

A maritime force element is considered battleworthy when it is seaworthy, has achieved the designated mission specific competencies, its missions systems will operate at optimal performance and it is provisioned with supplies to support the mission over the specified operational viability period.

Note: Additionally the force element must be effectively organised, managed and led to undertake the specified mission.

Benign Operation

The use of armed force for the capabilities not directly associated with combat that they can provide.

Blockade

An operation intended to disrupt the enemy's economy by preventing ships of all nations from entering or leaving specified coastal areas under the occupation and control of the enemy. Blockade is an act of war and the right to establish it is granted to navies under the traditional laws of war. This law requires, inter alia, that the blockade must be effective, that it is to be declared by the belligerent so that all interested parties know of its existence and that it is confined to ports or coasts occupied by the enemy. The expression is used more broadly to mean a combat operation carried out to prevent access to, or departure from the coast or waters of a hostile state. **(AMD)**

Belligerent

In time of crisis or war, an individual, entity, military force or state engaged in conflict. **(AAP-6)**

Campaign

A set of military operations planned and conducted to achieve a strategic end state or objective within a given time and geographical area. **(ADDP 3.0)**

Capability

The power to achieve a desired operational effect in a nominated environment within a specified time and to sustain that effect for a designated period. In a military context, capability is achieved by developing a force structure appropriately prepared for a range of military operations. **(ADDP 4.1)**

Capstone Doctrine

The single, foundational doctrine publication which sits at the apex of the doctrine hierarchy, and from which all other doctrine is derived. **(ADDP-D)**

Centre of Gravity

Characteristics, capabilities or localities from which a nation, an alliance, a military force or other grouping derives its freedom of action, physical strength or will to fight. The centre of gravity at each level of conflict may be different. **(AMD)**

Chain of Command

The succession of commanding officers from a superior to a subordinate through which command is exercised. **(AAP-6)**

Choke Points

Relatively narrow shipping lanes which are vulnerable to closure by force.

Clandestine

Activity planned and conducted to ensure secrecy or concealment. It is different from covert activity in that emphasis is placed on concealment of the activity rather than concealment of the identity of the sponsor. **(ADDP 2.1)**

Clearance Diving

The process involving the use of divers for locating, identifying and disposing of mines. **(AMD)**

Close Blockade

A blockade that denies an enemy access to or from their ports. See distant blockade. **(AMD)**

Close Escort

Escort of shipping where the escorting force is in company with escorted shipping and can provide a measure of direct defence. **(AMD)**

Coalition Operation

An operation conducted by the forces of two or more nations, which may not be allies, acting together for the accomplishment of a single mission. **(ADDP-D)**

Coastal State

A state party within the terms of the UNCLOS with a coastline under its lawful jurisdiction. **(UNCLOS)**

Coercion

The use, or threat, of force to persuade an opponent to adopt a certain pattern of behavior, against their wishes. **(AMD)**

Combat

Military combat is a contest in which parties attempt to achieve mutually incompatible aims through the organised use of violence by armed forces. **(AMD)**

Combat Air Patrol

An aircraft patrol provided over an objective area, the force protected, the critical area of a combat zone, or in an air defence area, for the purpose of intercepting and destroying hostile aircraft before they reach their targets. **(AAP-1000-D)**

Combat Fatigue

The state of an individual or group of individuals seriously suffering from the stress of battle.

Combat Information

That frequently perishable data gathered in combat by, or reported directly to, units which may be immediately used in battle or in assessing the situation. Relevant data will simultaneously enter intelligence reporting channels. **(AAP-6)**

Combat Support Elements

Those elements whose primary missions are to provide combat support to the combat forces and which are a part, or prepared to become a part, of a theatre, command or task force formed for combat operations. **(AMD)**

Combined Operation

A military operation conducted by forces of two or more allied nations acting together. **(AAP-1000-D)**

Command

The authority which a commander in the military Service lawfully exercises over subordinates by virtue of rank or assignment. Command includes the authority and responsibility for effectively using available resources and for planning the employment of, organising, directing, coordinating and controlling military forces for the accomplishment of assigned missions. It also includes responsibility for health, welfare, morale and discipline of assigned personnel. **(ADDP-D)**

Command and Control

The process and means for the exercise of authority over, and lawful direction of, assigned forces. **(ADDP 00.1)**

Command of the Sea

The ability to use the sea in its entirety for one's own purposes at any time and to deny its use to an adversary. Command of the sea implies that dominance has been achieved to such a degree that the risk to one's own forces from enemy action is negligible or non-existent. **(AMD)**

Commanding Officer

The officer in command of a warship, other military unit or formation.

Component Force

Each Service element of a joint force is called a component force or a joint task force and is titled maritime, air, land or other component as appropriate.

Concerted Multinational Operations

Operations in which the forces of more than one friendly or allied nation are operating in the same theatre but without formal arrangements to co-ordinate operations or an integrated command structure. They co-operate to the extent that mutual interference may be minimised, information may be exchanged and some logistic support and mutual training offered. **(AMD)**

Conflict

A politico-military situation between peace and war, distinguished from peace by the introduction of organised political violence and from war by its reliance on political methods. It shares many of the goals and characteristics of war, including the destruction of governments and the control of territory. **(ADDP-D)**

Consolidation

The replenishment of organic logistic shipping by freighting vessels. **(AMD)**

Constabulary Operation

The use of military forces to uphold a national or international law, conducted in a manner in which minimum violence is used in enforcement only as a last resort and after evidence of a breach or intent to defy has been established beyond reasonable doubt. The level and type of violence that is permitted will frequently be specified in the law, mandate or regime that is being enforced. Also known as policing.

Containment

The geographical restriction of the freedom of action of enemy forces. **(AMD)**

Containment by Distraction

Containment achieved by posing so great a threat to an enemy in one area (particularly in home waters or close to critical vulnerabilities) that enemy forces are retained in defence allowing friendly forces elsewhere to be unmolested. **(AMD)**

Contiguous Zone

In a zone beyond and adjacent to the territorial sea, described as the contiguous zone, the coastal state may exercise the control necessary to prevent infringement of its customs, fiscal, immigration or sanitary laws and regulations within its territory or territorial sea; and punish infringement of the above laws and regulations committed within its territory or territorial sea. The contiguous zone may not extend beyond 24 nautical miles from the baselines from which the breadth of the territorial sea is measured. **(ADDP 06.4)**

Continental Shelf

An area of the seabed and the subsoil adjacent to the coast but beyond the territorial sea in which the coastal state has sovereign rights for the purpose of exploration, control and exploitation of the living and natural resources. The extent of the area can be defined by formulae developed by UNCLOS. **(UNCLOS)**

Control

The authority exercised by a commander over part of the activities of subordinate organisations, or other organisations not normally under their command, which encompasses the responsibility for implementing orders or directives. All or part of this authority may be transferred or delegated. **(ADDP-D)**

Control of the Air

As an air power role, the ability to conduct operations in the air, land and maritime domains without interference from adversary air power and air defence capabilities. **(AAP 1000-D)**

Convoy

A number of merchant ships or naval auxiliaries, or both, usually escorted by warships and/or aircraft, or a single merchant ship or naval auxiliary under surface escort, assembled and organised for the purpose of passage together. The intent of convoy is to reduce losses through enemy action, to make best use of protective forces and to increase losses of enemy attacking forces. **(AMD)**

Coordinated Multinational Operations

Operations in which participating friendly or allied nations share objectives to the extent that formal arrangements can be made to apportion tasks or areas of responsibility and to provide mutual assistance. However, there is no integrated command structure. **(AMD)**

Counter Air Operation

An air operation directed against the enemy's air offensive and air defensive capability in order to attain and maintain a desired degree of air superiority. **(AAP-6)**

Counter Insurgency

Those military, paramilitary, political, economic, psychological and civic actions taken to defeat insurgency. **(AAP-6)**

Counter Insurgency Operations

A generic term used to describe the operations which forces may have to undertake when maintaining and restoring law and order, in support of an established government.

Counter Piracy

Those military, paramilitary, political, economic, psychological and civic actions taken to defeat piracy.

Counter Terrorism

All offensive measures taken to neutralise terrorism before and after hostile acts are carried out. Such measures include those counter-force activities justified for the defence of individuals as well as containment measures implemented by military forces or civilian organisations. **(AAP-6)**

Cover

The action by land, air or sea forces to protect by offence, defence or threat of either or both. Cover may extend to actions in the electromagnetic spectrum. **(AAP-6)**

Covering Force

A force operating apart from the main force for the purpose of intercepting, engaging, delaying, disorganising and deceiving the enemy before they can attack the force being covered. **(AAP-6)**

Covert

Activity planned and conducted to conceal the identity of, or permit plausible denial by, the sponsor. It differs from clandestine activity in that emphasis is placed on concealment of the identity of sponsor rather than on concealment of the activity. **(ADDP 2.1)**

Crisis

A situation, which may or may not be foreseen, which threatens national security or interests or international peace and stability, and which requires decision and action. **(AMD)**

Customary International Law

Those laws that represent the long-standing and consistent practice among most States with respect to a particular subject and which are accompanied by the belief of such States that the practice is obligatory. A long-continued practice acquiesced in by other States may create customary international law irrespective of the intent of those States. A State, as a member of the community of nations, may therefore be said to have tacitly consented to it. Customary international law is one of the principal sources of international law.

Damage Control

Measures necessary aboard ship to preserve and re-establish watertight integrity, stability, manoeuvrability and offensive power; to control list and trim; to effect rapid repairs of materiel; to limit the spread of, and provide adequate protection from fire; to limit the spread of, remove the contamination by, and provide adequate protection from toxic agents; and to provide for care of wounded personnel. **(AAP-6)**

Data Link

The means of connecting one location to another for the purpose of transmitting and receiving data. **(US JP 1-02)**

Deception

Those measures designed to mislead the enemy by manipulation, distortion, or falsification of evidence to induce behaviour prejudicial to their interests. **(AAP-6)**

Decisive Point

A significant operational milestone that exists in time and space or the information domain which constitutes a key event, essential task, critical factor or function that, when executed or affected, allows a commander to gain a marked advantage, or contributes to achieving success. **(ADDP 3.0)**

Defence in Depth

The siting of mutually supporting defence positions designed to absorb and progressively weaken attack, prevent initial observations of the whole position by the enemy, and to allow the commander to manoeuvre their reserve. The siting of units for defence in depth at sea can be either relative to other units for a force in transit or geographical for a force in an operating area. It will rely upon the mutual support provided by layered defence. **(AAP-6)**

Demonstration

An attack or show of force on a front where a decision is not sought, made with the aim of deceiving the enemy. **(AAP-6)**

Deny

To prevent enemy use of an area, feature, route, facility or combat capability in a particular environment, by a physical or implied presence, firepower, obstacles, contamination, destruction or a combination of these measures.

Destroyer

High speed warship designed to operate offensively with strike forces, with hunter-killer groups, and in support of amphibious operations. Destroyers also operate defensively to screen support forces and convoys against submarine, air and surface threats. **(AMD)**

Destroy

Render an adversary or object permanently ineffective.

Deterrence

Persuade an actor that the consequences of a course of action would outweigh potential gains. **(ADFP 5.0.1)**

Disaster Relief

Goods and services provided to meet the immediate needs of disaster affected communities. **(ADDP 3.20)**

Dislocation

Involves action to render the enemy's strength irrelevant by not allowing it to be employed at the critical time or place. It effectively separates the enemy's centre of gravity from the key capabilities that support or protect it. **(ADDP 3.0)**

Disruption

A direct attack that neutralises or selectively destroys key elements of the enemy's capabilities. The aim of disruption is to reduce the enemy's cohesion and will to fight by neutralising or destroying parts of their force in a manner that prevents the force from acting as a coordinated whole. **(ADDP 3.0)**

Distributed Operations

An operational approach that enables influence over larger areas through spatially separated small units, empowered to call for and direct fires, and to receive and use real-time and direct intelligence, surveillance and reconnaissance.

Distant Blockade

A blockade that denies the enemy passage through a sea area through which all ships must pass in order to reach the enemy's territory. **(AMD)**

Distant Escort

Escort of shipping where the protective forces are not sufficiently close to provide a measure of direct defence but effect protection by deterrence through the threat of reprisals. **(AMD)**

Distraction

Situation in which an enemy is unable to concentrate forces in a time and place of their choosing because of the threat of attack elsewhere. **(AMD)**

Doctrine

Fundamental principles by which the military forces guide their actions in support of objectives. It is authoritative but requires judgment in application. **(ADDP-D)**

Electronic Warfare

Military action to exploit the electromagnetic spectrum, encompassing: the search for, interception and identification of electromagnetic emissions; the employment of electromagnetic energy, included directed energy, to reduce or prevent hostile use of the electromagnetic spectrum; and actions to ensure its effective use by friendly forces. **(ADDP 3.5)**

Embargo

A prohibition on the entry or egress of shipping into a port. In recent history this has been frequently used for prohibitions of certain categories of cargo such as munitions. **(AMD)**

End State

The political and/or military situation to be attained at the end of a campaign or operation, which indicates that the objective has been achieved. **(ADDP 5.0)**

Endurance

The time an aircraft can continue flying or a ground vessel or ship can continue operating under specified conditions, eg without refuelling. **(AAP-6)**

Escalation/de-escalation

A qualitative transformation in the character of a conflict where the scope and intensity increases or decreases, transcending limits implicitly accepted by both sides. **(AMD)**

Escort

A combatant unit or units assigned to accompany and protect another force. Used colloquially as a generic expression for a destroyer or frigate. **(AAP-6)**

Exclusion Zone

A zone declared by a military force or nation, the entering of which zone by forces of a potential enemy would be regarded as hostile intent or a hostile act. The zone may be moving or stationary and may include the airspace above it.

Exclusive Economic Zone

An area beyond and adjacent to the territorial sea, subject to the specific legal regime established in Part V of the *United Nations Convention on the Law of the Sea, 1982*, under which the rights and jurisdiction of the coastal state, and the rights and freedoms of other states, are governed by the relevant provisions. The EEZ shall not extend beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured. **(ADFP 06.1.2)**

Expeditionary Forces

Forces projected from the home base capable of sustained operations at distance from that home base.

Expeditionary Operation

Military operations which can be initiated at short notice, consisting of forward deployed, or rapidly deployable, self-sustaining forces tailored to achieve a clearly stated objective in a foreign country.

Favourable Air Situation

A situation in which the extent of the air effort applied by the opponent is insufficient to prejudice the success of specific friendly maritime, land or air operations delineated in time and space.

Feeder Port

A port of lesser economic value that feeds into major arterial trade routes, joining the main stream of container traffic that feeds into neighbouring hub ports.

Fire Support

The application of fire, co-ordinated with the manoeuvre of forces, to destroy, neutralise or suppress the enemy. **(AAP-6)**

Flag of Convenience

A flag state in which a ship has been registered only to gain some financial or legal advantage.

Flag State

A state that registers ships and assumes jurisdiction under its domestic law for those ships. A ship must fly the flag of its flag state **(UNCLOS)**

Fleet in Being

The use of options provided by the continued existence of one's own fleet to constrain the enemy's options in the use of their fleet. **(AMD)**

Focal Area

A trade route, or a confluence of such trade routes, whose geographic features are such that it can be closed or controlled with comparative ease, to strategic effect.

Fog of War

Uncertainty and confusion generated in wartime by a combination of limited, incomplete, inaccurate and contradictory information, deliberate deception and the mayhem and stress caused by combat. **(AMD)**

Force Element

A component of a unit, a unit, or an association of units having common prime objectives and activities. **(ADDP 3.0)**

Force Generation

The process of providing suitably trained and equipped forces, and their means of deployment, recovery and sustainment to meet all current and potential future tasks, within required readiness and preparation times. **(ADDP-D)**

Force in Being

The use of options provided by the continued existence of one's own forces to constrain the enemy's options in the use of their forces.

Force Multiplier

A platform or system with latent capabilities which, when applied in conjunction with other assets, has a multiplier effect on applied capability. For example, underway replenishment ships have a force multiplier effect on surface combatant capability.

Force Protection

All measures and means to minimise the vulnerability of personnel, facilities, materiel, information and operations to any threat from an adversary or operating environment while preserving the freedom of action and the operational effectiveness of the force. **(AAP-1000-D)**

Forward Presence

Strategic choice to maintain forces deployed at distance from the home base or stationed overseas to demonstrate national resolve, strengthen alliances, dissuade potential adversaries, and enhance the ability to respond quickly to contingencies. **(AMD)**

Freedom of Navigation Operations

Operations of naval diplomacy designed to challenge an attempt to restrict free use of the seas by the passage of combat forces. Freedom of navigation operations may be symbolic or coercive. **(AMD)**

Freedom of the Seas

The right of aircraft, ships and submarines to travel freely respectively above, on or beneath the high seas.

Friction

Features of war that resist all action, make the simple difficult, and the difficult seemingly impossible. Friction may be mental (such as indecision) or physical (such as enemy fire). Friction may be imposed by enemy action or a variety of other physical and human factors. Fear is a key factor in the appearance of friction in military operations.

Frigate

Escort vessel designed to provide air, surface and undersea defence to naval forces and convoys. It is capable, if required, of conducting sustained independent operations to achieve a variety of missions.

Full Command

The military authority and responsibility of a commander to issue orders to subordinates. It covers every aspect of military operations and administration and exists only within national Services. Note: the term 'command' as used internationally, implies a lesser degree of authority than when it is used in a purely national sense. No international or coalition commander has full command over the forces assigned to them as nations will only delegate operational command or operational control. **(ADDP 00.1)**

Group

A number of ships, submarines and/or aircraft, normally a subdivision of a force, assigned for a specific purpose. **(US JP 1-02)**

Guerre de Course

A campaign directed at the merchant shipping of the enemy. It may have the intent of achieving leverage by damaging their international trade or be an outright effort to cut off supplies to their domestic economy.

Hard Kill

The use of explosive or kinetic weapons to achieve physical destruction of a target.

Harmonisation (of ROE)

The process whereby the rules of engagement of more than one nation taking part in a multinational operation are compared and altered where possible to achieve similar levels of permission and prohibition through the various national systems. **(AMD)**

High Seas

All parts of the sea which are not included in the territorial seas or internal waters of states. All states have the freedom to navigate or conduct other activities, subject to certain restrictions, on the high seas. Where states have declared other zones beyond the territorial sea (contiguous zone, exclusive economic zone, continental shelf), the traditional high seas freedoms are affected by the rights that coastal states can exercise in such zones. **(UNCLOS)**

Host Nation

A nation which by arrangement receives forces and materiel of other nations operating on/ from or transiting through its territory, allows materiel support and/or organisations to be located on its territory; and/or provides support for these purposes. **(ADDP 3.0)**

Hot Pursuit

A legal concept that permits a coastal state to exercise jurisdiction over foreign vessels and foreign nationals on the high seas if the following conditions are met: there is good reason to believe that the foreign vessel has violated the laws or regulations of the coastal state; the pursuit commences when the foreign vessel is within a maritime zone (internal waters, territorial sea, contiguous zone, EEZ or on the continental shelf) of the coastal state where the relevant law or regulation is in force; the pursuit is conducted by a warship or military aircraft or a vessel clearly marked and identifiable as being on government service; the pursuit commences after a visual or auditory signal to stop has been given at a distance that enables it to be seen or heard and the pursuit is continuous, but need not be conducted by the same vessel or aircraft that commenced the pursuit. The right of hot pursuit ceases as soon as the pursued ship enters the territorial sea of its own state or of a third state. Finally where a ship has been stopped or arrested outside of the territorial sea of the coastal state, in circumstances which do not justify the exercise of the right of hot pursuit, the ship is entitled to compensation for any loss or damage it may have sustained.

Hub Port

A port which is situated at the intersection of arterial trade routes where the main stream of container traffic splits into feeder ports.

Human Network

A social structure composed of individuals, friends, collaborators and organisations connected through technology using a variety of communication devices. It is the intersection of communications networks and social networks.

Humanitarian Assistance

Goods and services provided to meet the immediate needs of conflict affected communities. **(ADDP 3.2)**

Hydrography

The science which deals with the measurements and description of the physical features of the oceans, seas, lakes, rivers and their adjoining coastal areas, with particular reference to their use for navigational purposes. **(AAP-6)**

Indiscretion Ratio

An indication of the potential for a conventional submarine to be detected while on, or near, the sea surface; being the ratio of time recharging batteries to that of discharging the batteries.

Innocent Passage

Innocent passage entitles a warship to traverse another State's territorial seas 'continuously and expeditiously'. Passage is innocent as long as it is not prejudicial to the peace, good order or security of the coastal or island State. **(ADDP 06.4)**

Infrastructure

A term generally applicable to all fixed and permanent installations, fabrications or facilities for the support and control of military forces. **(AAP-6)**

Insurgency

An organised movement aimed at the overthrow of a constituted government through one of subversion and armed conflict. **(AAP-6)**

Intelligence

The product resulting from the processing of information concerning foreign nations, hostile or potentially hostile forces or elements, or areas of actual or potential operations. The term is also applied to the activity which results in the product and to the organisations engaged in such activity. **(ADDP 2.0)**

Interdiction

Actions to divert, disrupt, delay or destroy the enemy before they can affect friendly forces. **(AMD)**

Internal Waters

All waters actually within the territory of a state such as harbours, rivers and lakes; together with all other waters to landward of the baseline from which the state's territorial sea is measured. They are an integral part of the territory of the state in which the laws of the land apply with little exception. **(UNCLOS)**

International Strait

Straits used for international navigation between one part of the high seas or an EEZ and another part of the high seas or EEZ. In these straits all ships and aircraft enjoy the right of transit passage, which shall not be impeded; except that, if the strait is formed by an island of a state bordering the strait and its mainland, transit passage shall not apply if there exists seaward of the island a route through the high seas or through an EEZ of similar convenience. **(ADDP 6.4)**

Interoperability

The ability of systems, units or forces to provide services to, and accept services from, other systems, units or forces and to use the services so exchanged to enable them to operate effectively together. **(ADDP-D)**

Intervention

A campaign or operation with limited objectives, involving the entry of another state where opposition is expected. **(AMD)**

Joint

Activities, operations, organisations in which elements of at least two Services participate. (When all Services are not involved, the participating Services shall be identified, e.g. Joint Navy-Army) **(AAP-6)**

Joint Force

A general term applied to a force composed of significant elements of the Navy, Army and Air Force, or two or more of these Services, operating under a single joint force commander. **(ADDP 3.0)**

Joint Force Area of Operations

That area necessary for joint military operations and their administration. **(ADDP 3.0)**

Joint Task Force

A force composed of assigned or attached elements of two or more Services established for the purpose of carrying out a specific task or mission. **(ADDP 00.1)**

Jus Ad Bellum

The body of customary international law containing the legal rules relating to the right of States to have recourse to the use of force in international relations.

Jus In Bello

The body of customary international law containing the legal rules dealing with the conduct of States and combatants during armed hostilities, otherwise simply known as 'the law of war'.

Landing Force

The task organisation of ground and aviation units assigned to an amphibious operation. **(AAP-6)**

Latent Capabilities

Capabilities that are not always used in the primary role, but which are inherent, intrinsic, and accessible through adaptation and multi-role employment.

Law of Armed Conflict

The international law regulating the conduct of States and combatants engaged in armed hostilities. Often termed 'law of war'.

Layered Defence

The disposition of protective assets possessing a mixture of anti-submarine, anti-surface and anti-air capabilities in layers of screens and patrol areas about units of high value or crucial waters. **(AMD)**

Level of Conflict

The recognised levels of conflict from which the levels for the planning and command of operations are derived. They are strategic, operational and tactical. **(ADDP 3.0)**

Leverage

Disproportionate strategic or operational advantage gained by the use of a form of military power to exploit its geographical circumstances. **(AMD)**

Lift

The capability to move resources between two points. **(AMD)**

Limited War

Armed conflict, short of general war, confined to a single theatre of operation involving the overt engagement of the forces of two or more nations. **(US JP 1-02)**

Lines of Communication

All the land, water and air routes that connect an operating military force with one or more bases of operations, and along which materiel, supplies and personnel move.

Littoral

The areas to seaward of the coast which are susceptible to influence or support from the land and the areas inland from the coast which are susceptible to influence or support from the sea.

Littoral Manoeuvre

The use of the littoral as an operational manoeuvre space from which a sea-based joint amphibious force can threaten, or apply and sustain, force ashore.

Logistics

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

- a. design and development, acquisition, storage, movement, distribution, maintenance, evacuation, and disposal of materiel;
- b. transport of personnel;
- c. acquisition or construction, maintenance, operation, and disposition of facilities;
- d. acquisition or furnishing of services; and
- e. medical and health service support. **(ADDP 4.5)**

Logistics over the Shore

The loading and unloading of ships without the benefit of deep fixed port facilities in friendly or non-defended territory, and, in time of war, during phases of theatre development in which there is no opposition by the enemy.

Logistic Support Element

A task element deployed forward to coordinate the logistic support of units in theatre.

Lowest Astronomical Tide

The lowest tide level which can be predicted to occur under average meteorological conditions under any combination of astronomical conditions.

Mandate

The terms of a UN Security Council resolution and any further direction given by the relevant international organisation or other international agreement.

Manoeuvre Warfare

A philosophy that seeks to collapse the enemy's cohesion and effectiveness through a series of rapid, violent, and unexpected actions that create a turbulent and rapidly deteriorating situation, with which the enemy cannot cope. **(ADDP-D)**

Manoeuvrist

A term describing an approach that employs the principles of Manoeuvre Warfare. **(AMD)**

Maritime Doctrine

That component of doctrine which sustains the employment of armed forces at and from the sea.

Maritime Domain

The series of jurisdictional zones that surrounds the coast of a State. It includes territorial seas and the Exclusive Economic Zone (EEZ). **(AMD)**

Maritime Forces

Forces whose primary purpose is to conduct military operations at, over and from the sea. The expression includes surface combatants, submarines, auxiliaries, chartered vessels, organic aircraft and helicopters, shore installations intended for coastal and maritime defence and land forces, shore based aircraft and helicopters assigned to maritime tasks.

Maritime Geospatial Information

Geospatial information which is necessary for the planning and conduct of maritime operations.

Maritime Interdiction Operation

An operation conducted to enforce prohibition on the maritime movement of specified persons or material within a defined geographic area. **(AAP-6)**

Maritime Patrol Aircraft

Surveillance, undersea and surface warfare aircraft capable of operating in maritime areas at extended distances from their base.

Maritime Power Projection

Power projection in and from the maritime environment, including a broad spectrum of offensive military operations to destroy enemy forces or logistic support or to prevent enemy forces from approaching within enemy weapons' range of friendly forces. Maritime power projection may be accomplished by amphibious assault operations, attack of targets ashore, or support of sea control operations. **(US JP 1-02)**

Maritime Operation

An action performed by forces on, under or over the sea to gain or exploit control of the sea or to deny its use to an enemy. **(AAP-6)**

Maritime Reconnaissance

The acquisition of information of intelligence interest employing aircraft, surface vessels, submarines and underwater detection devices.

Maritime Superiority

The capability of a state to establish sea control at will in any area of importance to that state. **(AMD)**

Maritime Strategy

The comprehensive direction of all aspects of national power to achieve national strategic goals by exercising some degree of control at sea.

Master (Mariner)

The captain of any merchant vessel, irrespective of size, qualified to take command by passing a professional examination for a Master's Certificate.

Merchant Ship (Merchant Vessel)

A vessel engaged in mercantile trade except river craft, estuarial craft or craft which operate solely within harbour limits. **(ADDP 06.4)**

Meteorology

The science of understanding the weather.

Military Strategy

That component of national or multinational strategy, presenting the manner in which military power should be developed and applied to achieve national objectives or those of a group of nations. **(ADDP-D)**

Mine Countermeasures

All methods for preventing or reducing damage or danger from mines. **(US JP 1-02)**

Mission

A clear, concise statement of the task of the command and its purpose. **(ADDP-D)**

Mission Essential Unit

A unit, the destruction, serious damage or withdrawal from operation of which would prevent the successful completion of the mission.

Mission System

That element of the capability that directly performs the operational function. This includes platforms (e.g. ships, vehicles or aircraft); distributed systems (e.g. communications networks); and discrete systems that integrate into other mission systems (e.g. radar upgrade for a platform). Major support system components (such as simulators, automatic test equipment and logistic information management systems) could also be classified as mission systems if the level of management attention to be applied to these components warranted this classification. **(ADDP 4.1)**

Mobility

A quality or capability of military forces which permits them to move from place to place while retaining the ability to fulfil their primary mission. **(AAP-6)**

Multinational Force

Composed of forces of two or more nations, undertaken within a structure of a coalition, alliance or under the supervision of an international organisation such as the United Nations. Note: It is used to encompass all related terms such as allied, bilateral, combined or multilateral. **(ADDP 0.9)**

National Command

A command that is organised by, and functions under the authority of, a specific nation. **(ADDP 00.1)**

National Interests

The general and continuing ends for which a State acts. **(ADDP 00.3)**

National Security

The ability to preserve the nation's physical integrity and territory; to maintain the economic relations with the rest of the world on reasonable terms; protect its nature, institutions and governance from disruption from outside; and control its borders. **(ADDP-D)**

Naval Cooperation and Guidance for Shipping

The provision of military cooperation, guidance, advice, assistance and supervision to merchant shipping to enhance the safety of participating merchant ships and to support military operations. **(AMD)**

Naval Diplomacy

The use of naval forces in support of diplomacy to support, persuade, deter or coerce.

Naval Forces

Seaborne military forces including surface combatants, submarines, amphibious and mine warfare units, hydrographic and oceanographic units, organic helicopters and auxiliaries.

Naval Gunfire Support

Gunfire provided by surface combatants in direct support to operations ashore.

Naval Surface Fire Support

Fire provided by naval surface gun, missile and electronic warfare systems at sea in support of a unit or units.

Naval Technical Regulatory System

A system controlling risk, during design, construction and maintenance, that is likely to affect fitness for material service, safety, and the environment. Its also requires material to be designed, constructed and maintained to approved standards, by competent and authorised individuals who are acting as members of authorised organisations whose work is certified correct.

Non-Combatant Evacuation Operation

An operation conducted to relocate designated non-combatants threatened in a foreign country to a place of safety. **(ADDP 3.10)**

Normal Mode (of Operation)

The normal activities of warships and military aircraft, including but not limited to conducting weapons and other exercises, flying operations, military training, coastal surveillance and manoeuvres. This implies that submarines are operating submerged and that normal mode is employed outside the territorial sea and internal waters of a coastal state. **(UNCLOS)**

Objective

A clearly defined and attainable goal for a military operation, for example seizing a terrain feature, neutralising an adversary's force or capability or achieving some other desired outcome that is essential to a commander's plan and towards which the operation is directed. **(ADDP 3.0)**

Oceanography

The science of understanding the physical properties of the ocean.

Officer in Tactical Command

In maritime usage, the senior officer present eligible to assume command, or the officer to whom they have delegated tactical command. **(AAP-6)**

Operation

A series of tactical actions with a common unifying purpose, planned and conducted to achieve a strategic or campaign end state or objective within a given time and geographical area. **(ADDP 5.0)**

Operational Art

The skilful employment of military forces to attain strategic goals through the design, organisation, sequencing and direction of campaigns and major operations. Operational art translates strategic into operational and ultimately tactical actions. It requires a commander to:

- a. identify the military conditions or end-state that constitute the strategic objective;
- b. decide the operational objectives that must be achieved to reach the desired end state;
- c. order a sequence of actions that lead to fulfilment of the operational objectives; and
- d. apply the military resources allocated to sustain the desired sequence of actions.

(ADDP 00.1)

Operational Command

The authority granted to a commander to specify missions or tasks to subordinate commanders, to deploy units, to reassign forces, and to retain or delegate operational control, tactical command and/or control as may be deemed necessary. Note: It does not of itself include responsibility for administration. **(ADDP 00.1)**

Operational Control

The authority delegated to a commander to direct forces assigned so that the commander may accomplish specific missions or tasks which are usually limited by function, time, or location; to deploy units concerned, and to retain or assign tactical control of those units. It does not include authority to assign separate employment of components of the units concerned. Neither does it, of itself, include administrative or logistic control. **(ADDP 00.1)**

Operational Design

The contemporary application of operational art in producing a schematic that represents the commander's operational approach to a situation. **(ADDP 5.0)**

Operational Environment

All the elements, conditions and circumstances which may influence the employment of capabilities and the decisions of the commander during campaigns and operations. Its chief characteristics are complexity, instability and persistent threat. **(ADDP 3.0)**

Operational Level of Conflict

The level of conflict concerned with the planning and conduct of campaigns and operations. It is at this level that military strategy is implemented by assigning missions, tasks and resources to tactical operations. **(ADDP-D)**

Operational Objective

A condition that needs to be achieved during a campaign or operation to enable the desired end-state to be reached. Correct assessment of operational objectives is crucial to success at the operational level. **(ADDP 5.0)**

Operational Viability Period

The period during which a deployed Defence element must be able to sustain itself until the mechanisms of the operational sustainability period are established. **(ADDP 00.2)**

Organic

In the naval context, capabilities that are borne within a naval force or formation. It is most frequently used in relation to ship-borne aircraft and helicopters, but can also refer to logistics, weapons and sensors.

Overt Operations

Operations conducted in such a manner that detection by a potentially hostile unit or force is either desired or is not a factor to be considered in the conduct of assigned missions.

Peacebuilding

A peace support operation employing complementary diplomatic, civil and - when necessary, military means, to address the underlying causes of conflict and the longer-term needs of the people. It requires a commitment to a long-term process and may run concurrently with other types of peace support operations. **(ADDP 3.8)**

Peace Enforcement

A peace support operation conducted to maintain a ceasefire or peace agreement where the level of consent and compliance is uncertain and the threat of disruption is high. The peace support force must be capable of applying credible coercive force and must apply the provisions of the ceasefire or peace agreement impartially. **(ADDP 3.8)**

Peacekeeping

A peace support operation following an agreement or ceasefire that has established a permissive environment where the level of consent and compliance is high and the threat of disruption is low. The use of force by a peace support force is normally limited to self-defence. **(ADDP 3.8)**

Peacemaking

A peace support operation conducted after the initiation of a conflict to secure a ceasefire or peaceful settlement, that involves primarily diplomatic action supported, when necessary, by direct or indirect use of military assets. **(ADDP 3.8)**

Peace Operation

A broad term that encompasses peacekeeping operations and peace enforcement operations conducted in support of diplomatic efforts to establish and maintain peace. **(ADDP 3.8)**

Piracy

An act of boarding or attempting to board any ship on the high seas with the apparent intent to commit theft or any other crime and with the apparent intent or capability to use force in the furtherance of that act.

Poise

An attribute of seaborne forces which permits them to remain deployed and positioned for long periods such that they are able to influence events or withdraw at will without the risk of embroilment.

Preparation

The process by which individuals, ships or units prepare for future military operations. For the RAN this includes the conduct of routine peacetime activities.

Preparedness

The measurement of how ready and how sustainable forces are to undertake military operations. It describes the combined outcome of readiness and sustainability. **(ADDP 4.1)**

Presence

The exercise of naval diplomacy in a general way involving deployments, port visits, exercising and routine operating in areas of interest to declare interest, reassure friends and allies and to deter. **(AMD)**

Principles of War

Guides to action and fundamental tenets forming the basis for appreciating a situation and planning, but their relevance, applicability and relative importance change with circumstances. **(AMD)**

Prisoner of War

Persons as defined in the Geneva Convention relative to the treatment of prisoners of war (12 August 1949, Part 1, Article 4).

Psychological Operations

Planned psychological activities in peace and war directed to enemy, friendly and neutral audiences in order to influence attitudes and behaviour affecting the achievement of political and military objectives. They include strategic psychological activities, consolidation psychological operations and battlefield psychological activities. **(AAP-6)**

Quarantine

Expression used loosely to mean a restriction on the egress of certain types of cargo. Also used to mean embargo enforcement. **(AMD)**

Rapid Environmental Assessment (REA)

Refers to the process of direction, collection, processing and dissemination of relevant information to provide a comprehensive and thorough understanding of the physical operational environment and its impact on military operations.

Note: It provides the underlying environmental data and information required to generate a suite of focused mission-specific environmental products in response to specific operational requirements. (ADDP 3.0)

Reach

The ability to operate for extended periods at considerable distance from shore support. **(AMD)**

Readiness

The time within which a unit or formation can be made ready to perform unit-type tasks. This time is simplified or measured by indicators of a unit's current personnel, materiel and training state. The time does not include transit time. Ships and their organic helicopters will have the required combat load and other logistic materiel embarked or appropriately positioned. **(AMD)**

Recognised Maritime Picture

The fullest achievable agreed level of identification and tracking of all air, surface and sub-surface contacts in the area of interest.

Reconnaissance

A mission undertaken to obtain, by visual observation or other detection methods, information about the activities and resources of an enemy or potential enemy; or to secure data concerning the meteorological, hydrographic or geographic characteristics of a particular area. **(ADPP 3.0)**

Reconstitution

The process by which individuals, ships and units reassume or recover to identified preparedness levels required by strategic policy.

Replenishment at Sea

Those operations required to make a transfer of personnel and/or supplies when at sea. **(AAP-6)**

Roulement

The rotation of personnel or units in the front-line with those in reserve in order to maintain the fighting effectiveness of the forces engaged in an operation.

Rules of Engagement

Directives endorsed by government and issued by commanders, which delineate the circumstances, and limitations within which military force may be applied to achieve military objectives. They do not inhibit or replace but are part of the command function. ROE may be framed to limit certain actions; alternatively, they may authorise actions to the full extent permissible under domestic and international law. **(ADDP 06.1)**

Sanction (United Nations)

A penalty imposed on a State with the intention of influencing that State to comply with a UN Security Council Resolution or otherwise to abide by international law.

Screen

An arrangement of ships, aircraft and/or submarines to protect a main body of ships or a convoy. **(AMD)**

Sea Basing

In amphibious operations, a technique of basing certain land force support functions aboard ship which decreases shore based presence.

Sea Control

That condition which exists when one has freedom of action to use an area of sea for one's own purposes for a period of time and, if required, deny its use to an adversary. The state includes the air space above, the water mass and seabed below as well as the electro-magnetic spectrum. To an increasing degree, it also includes consideration of space based assets.

Sea Denial

That condition which exists when an adversary is denied the ability to use an area of the sea for their own purposes for a period of time. **(AMD)**

Sea Lift

The movement of resources between points by shipping.

Sea Lines of Communication

The most efficient navigable routes followed by shipping from their points of departure to their destinations. SLOCs may refer in military operations to the maritime supply routes between operational forces and their supporting bases. The term is also used to describe the major commercial shipping passages of the world. SLOCs do not have a physical existence and should not be considered in the same way as lines of communication on land. **(AMD)**

Seakeeping

The dynamic characteristics of a ship surviving and operating in various conditions of swell, wave height, wave length and wind.

Sea Power

The sum of all physical, demographic, geographic, economic, and military resources that are derived from or related to the sea and that are used by a nation to advance its national interests. More specifically sea power expresses a nation's ability to defend, by means of a navy and its adjuncts, its maritime interests.

Sea Room

Unobstructed space at sea adequate for the tactical manoeuvring of a vessel.

Sea State

A scale that categorises the force of progressively higher seas by wave height. This scale is mathematically co-related to the Pierson-Moskowitz scale and the relationship of wind to waves. **(JP 1-02)**

Seaworthiness

A maritime mission system is seaworthy if its operation is in accordance with its Statement of Operating Intent and:

- a. it maximises the likelihood of achieving the specified operational effect for the defined tasking; and
- b. where efforts have been made to eliminate and/or minimise hazards and risks to personnel, the general public and the environment so far as is reasonably practicable.

Ship to Objective Manoeuvre

Projecting combined-arms forces by air and surface directly to critical operational objectives, dislocating adversaries in space and time.

Soft Kill

Efforts utilising other than explosive or kinetic systems to destroy or neutralise a target. They may include electronic measures.

Sovereign Immunity

Immunity under the exclusive jurisdiction of the flag State and from the enforcement of another State's laws. It extends to warships, and government vessels, and aircraft operated for non - commercial purposes.

Special Forces

Specially selected military personnel, trained in a broad range of basic and specialised skills, who are organised, equipped and trained to conduct special operations and can be employed to achieve strategic, operational or tactical level objectives across the operational continuum. **(ADDP 3.0)**

Spectrum of Operations

Operations covering the full range of potential violence from stable peace, through various forms of conflict, and up to and including general war.

Statement of Operating Intent

A document describing the approved roles, operating envelope, usage spectrum and operating environment for a particular mission system/class. It describes the mission systems physical characteristics, peacetime capability, limitations, usage, support, upkeep cycle and mission profiles. It is an unclassified document and does not cover war-fighting capabilities. It is a description of the systems intended roles and functions and provides guidance on how to manage platforms, and how Commanding Officers and other authorities operate and maintain their units in accordance with design intent.

Status of Forces Agreement

An agreement which defines the legal position of a visiting military force deployed in the territory of a friendly State. Agreements delineating the status of visiting military forces may be bilateral or multilateral. **(ADDP 00.3)**

Strategic Level of Conflict

That level of war which is concerned with the art and science of employing national power. **(ADDP-D)**

Strategic Strike Operations

Offensive actions designed to effect the progressive destruction and disintegration of the enemy's capability to wage war.

Strike

An attack which is intended to inflict damage on, seize or destroy an objective. **(ADDP 3.0)**

Surveillance

The systematic observation of aerospace, surface or subsurface areas, places, persons or things, by visual, aural, electronic, photographic or other means. **(ADDP 3.0)**

Sustainability

The ability of a force to conduct operations for the duration required to achieve its assigned operational tasks. Measured in terms of personnel, equipment, facilities and consumables. **(ADDP 4.0)**

Tactical Command

The authority delegated to a commander to specify tasks to forces under their command for the accomplishment of the mission assigned by higher authority. **(ADDP 00.1)**

Tactical Control

The detailed and, usually, local direction and control of movements and manoeuvres necessary to accomplish missions or tasks assigned.

Tactical Level of Conflict

The planning and conduct of battle by the application of concentrated force and offensive action to gain objectives. **(ADDP-D)**

Target

The object of a particular action, for example a geographic area, a complex, an installation, a force, equipment, an individual, a group or a system, planned for capture, exploitation, neutralisation or destruction by military forces. **(AAP-6)**

Targeting

The process of selecting and prioritising targets and matching the appropriate response to them, taking into account international and Australian national law, national and strategic objectives, and operational requirements and capabilities. **(AAP 1000-D)**

Task Element

The fourth and lowest level in which units are grouped within a task organisation. A task element may consist of any one ship or independent unit.

Task Force

A temporary grouping of units, under one commander, formed for the purpose of carrying out a specific task or mission. In a task organisation, a task force is the highest level in which units are grouped.

Task Group

The second highest level in a task organisation, a task group is a grouping of units under one commander subordinate to the task force commander, formed for the purpose of carrying out specific functions.

Task Organisation

A command organisation in which the various units and formations are organised by task into task forces, task groups, task units and task elements.

Task Unit

The third level in which units are grouped in a task organisation. A task group is normally divided into two or more task units according to the tasks required to be accomplished.

Territorial Sea

An area of waters adjacent to a state over which it exercises sovereignty, subject to the right of innocent passage. Every state has the right to establish the breadth of its territorial sea up to a limit not exceeding 12 nautical miles, measured from the baselines. **(ADDP 06.4)**

Theatre

A designated geographic area for which an operational level joint or combined commander is appointed and in which a campaign or series of a major operations is conducted. A theatre may contain one or more joint areas of operation. **(ADDP-D)**

Theatre Command

The authority given by CDF to CJOPS to command assigned forces to prepare for and conduct operations (campaigns, operations, combined and joint exercises and other activities) as directed). **(ADDP 00.1)**

Transit Passage

All vessels and aircraft have the right to unimpeded transit passage through and over straits used for international navigation. Transit passage must be continuous and expeditious and vessels and aircraft must not threaten or use force against nations bordering the strait. Transit passage is in the normal mode and includes activities such as fuel replenishment, submerged transit for submarines, organic flying operations and tactical manoeuvring. **(ADDP 06.4)**

Treaty Law

The obligations under a treaty which are binding only on States that are parties to the treaty. A treaty is sometimes known as a convention or international agreement. It is a legally binding document.

Unfavourable Air Situation

When operations can expect to encounter prohibitive interference from adversary air power and/or air defence capabilities. **(AAP 1000-D)**

Unmanned Aerial Vehicle

A vehicle that operates in the air domain and does not have a human operator onboard, is operated remotely, and is normally recoverable. **(AAP 1000-D)**

Unmanned Underwater Vehicle

A vehicle that operates in the maritime domain and does not have a human operator onboard, is operated remotely, and is normally recoverable.

Usage Upkeep Plan

A representation, in graphical form, of the ideal allocation of programmed maintenance availabilities within an upkeep cycle for ships of each particular class.

Warship

A ship belonging to the armed forces of a State bearing the external marks distinguishing such ships of its nationality, under the command of an officer duly commissioned by the government of the State and whose name appears in the appropriate service lists or its equivalent, and manned by a crew which is under regular armed forces discipline.

(UNCLOS Article 29)

Water Column

A vertical continuum of water from sea surface to the seabed.

Weapon System

A combination of one or more weapons with all related equipment, materials, services, personnel and means of delivery and deployment (if applicable) required for self – sufficiency. **(AAP 1000-D)**

Whole of Government

Denotes government departments and agencies working across portfolio boundaries to achieve a shared goal and an integrated government response to particular issues.

(APPD-D)

Work Up

The training program, both in harbour and at sea, by which naval units are brought to the required level of operational capability.

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