



AUSTRALIAN DEFENCE FORCE

FUTURE MARITIME OPERATING CONCEPT - 2025 MARITIME FORCE PROJECTION AND CONTROL

UNCLASSIFIED VERSION



FOREWORD

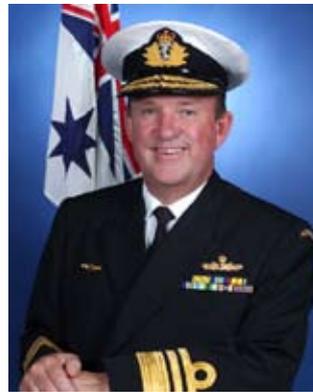
The Future Maritime Operating Concept 2025 (FMOC) is the ADF's long term, maritime, joint warfighting capability aspiration. The FMOC seeks to inform and guide Navy, Army and Air Force staffs and Capability Development Group in developing capability requirements for the future ADF in the maritime environment. While Navy leads the development of the FMOC, it is a joint, collaborative effort.

The FMOC is a subset of the Future Joint Operations Concept (FJOC). It supports the complementary environmental concepts: the Army-led Future Land Operating Concept and Air Force-led Future Air and Space Operating Concept. The FMOC is supported by the Joint, Single Service and Enabling Organisations experimentation programs. These programs examine areas of future concepts that are assessed as carrying the greatest risk and/or uncertainty. The results of experimentation inform capability development efforts and improve the fidelity of future iterations of the FMOC.

FMOC 2025 is approved for use by capability developers in considering the future maritime capability needs of the ADF. On behalf of the Chiefs of Service Committee, we commend FMOC 2025 to you.



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CONTENTS

FMOC 2025 UNCLASSIFIED VERSION - PART 1	5
INTRODUCTION	5
FMOC's Place in the ADF's Strategic Guidance Framework	5
Purpose, Validation and Classification	5
FMOC 2025 Content	5
Assumptions	6
FMOC 2025 - PART 2	7
THE FUTURE MARITIME WARFIGHTING PROBLEM	7
The Future Security Environment	7
A Construct for the Future Maritime Warfighting Problem	9
Maritime Mission Space	9
Maritime Projection Space	10
Maritime Battlespace	11
FMOC 2025 -PART 3	14
MARITIME FORCE PROJECTION AND CONTROL	14
MARITIME CAPABILITY ENABLERS	15
Knowledge, Command and Control	15
Knowledge	15
Command and Control	16
Enabling Elements	17
Maritime Manoeuvre	18
Enabling Elements	18
Assured Engagement	20
Enabling Elements	20
Sustained Presence	21
Enabling Elements	21
Enduring Protection	21
Enabling Elements	22
APPLICATION OF FMOC 2025	23





FMOC 2025 UNCLASSIFIED VERSION - PART 1

INTRODUCTION

FMOC's Place in the ADF's Strategic Guidance Framework

1. The Joint CDF/Secretary Directive 17/2005 addressing strategic planning directed the ADF to develop a system of long-range, concept-led, capability plans. As a result, a suite of future operating concepts has been developed. The Future Maritime Operating Concept (FMOC) is the ADF's future joint warfighting aspiration for the maritime environment. While the document is Navy-led, it is a joint document developed in collaboration with Army and Air Force and in consultation with other areas within Defence. When discussing Future Maritime Forces, those elements of air and land forces that form part of the maritime warfighting capability are included, for example Maritime Patrol Aircraft (MPA) and Landing Craft. In accordance with the CDF/Secretary's Directive, the FMOC will be reviewed every three years.
2. FMOC 2025 is a subset of the *Future Joint Operations Concept (FJOC)* and is informed by Government and ADF strategic guidance such as *Defence 2000 - Our Future Defence Force*, *Defence Updates 2003, 2005 and 2007*, *Defence Planning Guidance and Australia's Military Strategy*. Operational lessons learned that have relevance to future operations have also been considered in the development of the FMOC.
3. The FMOC complements the Army-led *Future Land Operating Concept* and the Air Force-led *Future Air and Space Operating Concept*. The joint and environmental operating concepts are supported by joint capability integrating concepts. Ongoing interoperability with allied nations is a key consideration in the development of ADF future concepts. Therefore, the FMOC has been developed with due regard to compatibility with the future maritime operating concepts of the United States and Great Britain. FMOC 2025 should therefore be read in conjunction with the Future Joint Operations Concept, the complementary Army and Air Force-led environmental concepts and strategic guidance.

Purpose, Validation and Classification

4. **Purpose.** The purpose of FMOC 2025 is to inform the development of future ADF combat capabilities in the maritime environment.
5. **Focus.** Consistent with Government direction, the ADF focuses its capability development and acquisition on combat capabilities. As the Minister for Defence stated in early 2005: *'So whilst we expect calls upon the ADF to be other than a response to a conventional military threat, we still see our first responsibility to be to continue to build the warfighting capability of a nation. That is the capability which can't be substituted'*. Therefore FMOC 2025 is focused on combat capabilities. However, it considers capability issues arising out of missions other than warfighting, particularly those involving collaboration with Other Government Departments (OGDs).
6. **Classification.** Initially FMOC 2025 was developed as a classified document. This unclassified document has been developed to allow for wider dissemination in the defence community; however the classified version remains the definitive document and should be referred to for all future planning considerations. The classified version can be found on the Defence Secret Network through the Navy Futures webpage.
7. **Validation.** The FMOC is effectively a hypothesis that asserts how ADF maritime combat power should be delivered in the future. It is based on professional judgment and joint consultation. Hypotheses require testing and examination. This is achieved through the conduct of experimentation. Defence experimentation consists of the Joint, Navy, Army, Air Force and enabling organisations' experimentation programs that are supported by Defence Science and Technology Organisation (DSTO). These programs use a range of techniques and activities such as wargaming, operational analysis, seminars, Limited Objective Experiments and computer simulation to examine the future operating concepts. Resources in support of Defence experimentation are limited, therefore it focuses effort on those areas of, in this case, the FMOC that are believed to carry the greatest risk and/or uncertainty. The results of experimentation inform capability development efforts. Experimentation results also improve the fidelity of future iterations of the FMOC and provide input to the joint and complementary Service-led experimentation programs. Involvement and examination of the results of allied wargaming and experimentation also assists with assessment of the FMOC.

FMOC 2025 Content

8. Future warfighting concepts assert a solution to a warfighting problem. The FMOC asserts a capability response describing a range of generic capability enablers that Future Maritime Forces (FMF) must possess to effectively conduct operations. To explore and define the boundaries of the future maritime warfighting problem, FMOC 2025 begins in Part 2 with a précis of the key judgments that resulted from an examination of the Future Security Environment (FSE) of the classified version.



Diplomatic/political, economic, societal, environmental, technological and military drivers are examined for potential threats to the national interest and the implications for future ADF maritime force operations. The purpose of the analysis is to deduce **what** missions future ADF maritime forces may have to undertake, **where** they may be required to undertake them and the anticipated **warfighting conditions** under which future maritime combat operations may have to be executed. As a construct for defining the future warfighting problem, FMOC 2025 describes a '**Maritime Mission Space**' (**what**) a '**Maritime Projection Space**' (**where**), and a '**Maritime Battlespace**' (**warfighting conditions and who**).

9. Once the future warfighting problem is defined, FMOC 2025 then asserts how maritime combat power should be delivered. It describes the future capability sets that will be required to respond to the warfighting problem. These capability sets are termed Maritime Capability Enablers (MCEs) and are defined in Part 3. They are the underpinning, critical components of future maritime capability required to respond to the future warfighting problem. They are described in broad, qualitative terms. The MCEs are then broken down into Enabling Elements. The Enabling Elements are the key sub-components of capability that are required to generate the capability described in the MCEs. The FMOC assertion, supporting MCEs and underpinning Enabling Elements describe the high level, maritime capability needs of the future ADF maritime force.
10. Every operating concept is based upon a number of underlying assumptions. These help bound the warfighting problem, guide development of a future warfighting solution and provide additional context for the statements and assertions made within the document.

Assumptions

11. The following assumptions underpin FMOC 2025:
 - a. The FMOC is to be focused on informing future combat capabilities.
 - b. In determining a small to medium sized force's future missions and tasks, an examination of the drivers of the future security environment is more important than attempting to predict a particular global security future.
 - c. The ADF will, in general, only acquire and develop capabilities that are structured and designed for combat operations. However, ADF capabilities will be regularly applied to other types of operations and this remains a consideration for future capability development.
 - d. The ADF will conduct complex, high-tempo combat operations outside of the region as part of a coalition force.
 - e. The ADF is to develop the capabilities to defend Australia and independently or leading regional coalitions, resolve regional security issues as required.
 - f. The ADF Network Centric Warfare (NCW) roadmap will deliver the capability to enable the application of the basic tenets of network enabled operations to be applied in future ADF operations and the FMOC.
 - g. The US will remain the benchmark and primary driver for ADF interoperability for the next two decades. ADF forces must be able to lead regional coalitions of other nations.
 - h. Funding of future capabilities has not been a principal driver of the FMOC hypothesis. Broad capabilities are described rather than specific capability solutions are described. However, the FMOC is written with an understanding that an asserted solution to the future warfighting problem supported by completely unrealistic and unaffordable MCEs and enabling elements is of limited value.



FMOC 2025 - PART 2

THE FUTURE MARITIME WARFIGHTING PROBLEM

12. Before asserting an ADF Future Maritime Force capability response, the future maritime warfighting problem must be defined. An examination of the future security environment must lead to a deduction of **what** Future Maritime Forces may have to do. It must also lead to a deduction of **where** maritime combat power is most likely to be delivered. Finally, it must describe the envisaged **warfighting conditions** under which future maritime combat operations will be executed. The description of these factors (what, where and warfighting conditions) defines the future warfighting problem addressed in Part 3 of the FMOC.
13. The range of potential drivers of future security issues and the resulting threats to the national interest generates the missions the Future Maritime Force must conduct. The geographic disposition of the likely threats to national interest informs where maritime force must be projected. A discussion of the warfighting trends, technology, the potential capabilities of the adversary and the actors in the battlespace describes future maritime warfighting conditions.

The Future Security Environment (FSE)

14. An analysis of the FSE is at Annex A of the classified FMOC. The analysis uses six drivers of future security issues as lenses through which to consider potential threats to the national interest that could generate tasks for the Future Maritime Force. Those drivers are: Political/Diplomatic, Economic, Environmental, Societal, Technological and Military. A précis of the key issues and deductions are contained in the following paragraphs.
15. **Political/Diplomatic.** Analysis of political/diplomatic drivers yielded the following issues and implications that frame the future warfighting problem:
 - a. **Issues.** The nation state will remain the core element of the international relations system. The potential for state-on-state conflict will generally be lower among nations that have developed free market systems, are integrated within the global economic and political system and significantly benefit from it. Non-state actors will continue to use rogue, failing or failed states as a base for future operations against western interests. Less robust systems of government will be tested by the pressures of globalisation, increasing populations, decreasing resources and societal changes. Preventing proliferation of WMD will remain an international concern over coming decades with an emphasis on preventing non-state actors accessing WMD.
 - b. **Implications for Future Maritime Operations.** The Future Maritime Force should be prepared to contribute to conventional coalition combat operations at potentially high tempo and levels of threat during the next two decades. The presence of nuclear, biological and chemical threats under these circumstances cannot be discounted. The FMF should also be prepared to contribute to combat operations against insurgent groups, including groups employing maritime terror tactics. Maritime Interdiction Operations in support of WMD counter proliferation activities are likely to be part of FMF requirements, whether against state or non state actors, as will be the requirement to conduct Non-combatant Evacuation Operations. Preservation of the freedoms of the sea will remain a key enabler of allied maritime operations. Divergences in international legal obligations will continue to impact the planning and conduct of allied and coalition combined operations.
16. **Economic.** Analysis of the economic drivers yielded the following issues and implications that frame the future warfighting problem:
 - a. **Issues.** The vast majority of global commodities, energy and manufacturing trade will continue to move by sea. For maritime nations such as Australia, economic survival depends upon open and secure Sea Lines of Communication (SLOCs). Globalisation will continue to increase the economic interdependence of industrialised and industrialising states. Dwindling energy reserves and other key resources will perpetuate the uneven distribution of global wealth, generating friction between and within states. It will also lead to competition for resources and as a result, in some circumstances, state-on-state conflict could arise. This is particularly the case in the maritime environment where resource boundaries are least well defined and most disputed. A globalised world, rising prices, failing states and resource scarcity will continue to facilitate opportunities for growth in transnational crime.
 - b. **Implications for Future Maritime Operations.** The FMF must have the capability to protect strategic SLOCs. The requirement to assist civilian authorities with law enforcement and border protection operations within Australia's maritime zones will remain extant. Law enforcement operations may also be required offshore when assisting with the security and recovery of failing or failed states. Future contests for energy could require the FMF to conduct security operations to stabilise areas that produce, store or refine energy. The FMF must be prepared to contribute to and possibly lead regional security and law enforcement combined operations.



17. **Environmental.** Analysis of the environmental driver yielded the following issues and implications that frame the future warfighting problem:
- Issues.** The implications of climate change in the longer term may have potentially serious repercussions for our region, for example submerging smaller islands of archipelagic nations thereby reducing the size of Exclusive Economic Zone (EEZ) and displacing populations. Increasing populations in littoral areas will increase consequences of natural disasters such as earthquakes, hurricanes and tsunamis. Rising populations will place increased stress on water supplies and competition for water could become a source of tension. While unlikely to be a cause for armed conflict in itself, it could serve as an exacerbating factor increasing tension between states. Disease and pandemics will remain part of the world's security landscape. Increasing populations in urban areas could increase the effects of outbreaks.
 - Implications for Future Maritime Operations.** To respond to environmentally driven security and humanitarian issues in urbanised, littoral areas, particularly where infrastructure is poor, the FMF must be able to deliver security and assistance capabilities from a sea base; as was the case in response to the Boxing Day Tsunami in 2004. In particular, the maritime force is likely to have to provide mobility, logistic support and hospital services. Border security when combating disease will also require FMF effort.
18. **Societal.** Analysis of the societal driver yielded the following issues and implications that frame the future warfighting problem:
- Issues.** By 2025, continued urbanisation in the littorals will place the vast majority of the world's population and, arguably, most potential security problems within reach of the sea. Religious fundamentalism will remain part of the security landscape, as will the potential for cultures to clash with each other and with State governments both within and across borders. Aging western societies and movements in intellectual capital will place pressure on innovation, research and the availability of skilled labour for the private and public sectors, and in particular militaries. Youth bulges in certain nations will cause potential unemployment and disaffection resulting in the development of a recruiting pool for disenfranchised groups. The confluence of economic, water, food and world health issues in certain countries could cause large migratory flows toward other countries, some of which would be unregulated.
 - Implications for Future Maritime Operations.** The littoral and urban environments will take on an increasing importance for the FMF. The presence of anti-western, regional extremist cells across a wide area may require the FMF to potentially support combat operations against them. The FMF must also maintain its force posture in recognition of the presence of these cells in the majority of the places it could operate, no matter how benign the mission. The FMF can be expected to play a law enforcement and security role in addressing the issue of unregulated migration; as has been the case with Operation RELEX/RESOLUTE. The ability to recruit and retain personnel will come under increasing pressure, a growth in FMF personnel numbers is likely to be a higher risk strategy. Movements in intellectual capital may shift the technology edge away from western nations.
19. **Technological.** Analysis of the technological driver yielded the following issues and implications that frame the future warfighting problem:
- Issues.** Technology will increase in capacity, complexity and applicability, and most importantly become more widely available over the next two decades. It will be the confluence of technologies that will create revolutionary advances in military applications, rather than any particular technology in its own right. For example, miniaturisation, hypersonics, advanced fuels and nano-enabled explosive compounds have the potential to create very fast and incrementally smaller missiles with greater explosive power. A further significant trend in future technologies that will impact the assessment of future concepts and the procurement of current capabilities is the observed compression of the technological development and take up cycle. Computing, communications and networks technologies, uninhabited autonomous vehicles, miniaturisation, hypersonics, directed energy and automation will feature in future military technology. Stealth, materials, nano, and nano-bio technologies are, and will increasingly be evident in military systems and platforms. Space will become increasingly accessible to state, non-state and independent actors contributing to a more transparent future maritime battlespace.
 - Implications for Future Maritime Operations.** Weapons will increase in lethality and larger lethal effects will be able to be delivered by individuals and small groups. Stealth and the increasing speed of weapons will reduce reaction times making persistent surveillance, speed of reaction and transmission of vital information crucial. Sensors will increase in sensitivity mitigating some of the effects of reduced reaction times but making it harder to reduce the observability of the FMF. Disrupting the adversary's targeting cycle at as many points as possible and enhancing own force cycles will grow in importance in creating an edge. Greater access to space will increase the transparency of the battlespace, particular on and above the water. Tactics, techniques and procedures must be able to mitigate the effects of disruption to timing and navigation signals from space. Maritime platforms with service lives of between 25 and 40 years, such as ships and maritime aircraft, will be exposed to increasingly



lethal environments and many technological improvement cycles. Trading off certain attributes at build will require careful consideration. Compressing technological cycles will make open architectures and continual, incremental weapon and sensor systems improvement programs essential.

20. **Military.** Analysis of the military driver yielded the following issues and deductions that frame the future warfighting problem:
 - a. **Issues.** An uncertain future security environment will see warning times fluctuate, often shortening. Responses to threats to the national interest will continue to become increasingly whole of government in nature. Joint operations are and will remain key to successful battlefield outcomes. Maritime forces will be required to provide greater support to joint forces ashore. US or UN-led coalitions will be the principal response forces for global security issues. Regional coalitions are also likely in response to regional issues. As has been the case in the past, asymmetry will be part of the future. Battle in complex and crowded terrain such as urban environments ashore and the littorals at sea and across the sea/land interface will predominate with the open ocean primarily being used as a manoeuvre space. The traditional phases of operations have blurred and will continue to do so as have the roles the military must undertake. The confluence of technology, asymmetry and insurgent groups will see the presence of increased lethality no matter what the mission. Elusive, rapidly moving adversaries will be present in both conventional and non-conventional combat operations. Access, basing and overflight issues are expected to remain part of the future warfighting problem and could possibly increase in severity. The Under Sea domain will remain the most opaque. Submarines, mine technologies, fighter aircraft and missile technologies are the key areas of future concern for the FMF. The inherent qualities of maritime forces; access, reach, poise, mobility in mass and persistence that have been force multipliers in the past will continue to be so in the future. The inherent limitations of speed, indirectness and transience will also remain present.
 - b. **Implications for Future Maritime Operations.** The FMF must operate as part of a versatile, robust, joint and integrated ADF that responds to threats to the national interest within a whole of government construct. The FMF must be adept at combined operations. The ability to rapidly deploy, multi-task in theatre and switch rapidly between tasks must be key features of a versatile force. Projecting force will involve greater influence over the land mass and offensive and logistic support to joint land forces. The manoeuvre space of the sea will assist in overcoming future access, basing and overflight issues. Speed over open ocean transits and asserting local sea control in the littoral will be key to successful future maritime operations. An increasingly lethal and transparent battlespace will require improved signature management and self protection. Maritime air platforms and uninhabited vehicles will assist in mitigating some of the inherent limitations of maritime forces and improve the persistence of surveillance and offensive reach of the FMF. Maritime forces must strive to retain a technological edge if practicable and affordable, but to ensure a fighting edge they must drive a knowledge and technology application advantage. Decision superiority through information management and the application of the operational art will be crucial.

A Construct for the Future Maritime Warfighting Problem

21. The judgements made regarding the drivers of the future maritime warfighting problem resulted in the identification of the range of likely future ADF maritime force missions and indicated where those missions may have to be conducted. Other factors also became clear. For example, the future operating environment will be extremely complex. The littorals will be very important and the maritime force will reach further inland in support of joint forces ashore. Lethal threats will be omnipresent across the range of future missions. Responses to security problems will continue to reflect today's trends and involve responses employing all elements of national power working in collaboration with military forces. The following paragraphs attempt to describe a simple construct for understanding the range, shape, complexities and boundaries of the future maritime warfighting problem. Simply, the framework offers that the future warfighting problem can be summarised as follows: Future Maritime Warfighting Problem = Maritime Mission Space (*what*) + Maritime Projection Space (*where*) + Maritime Battlespace (*warfighting conditions*).

Maritime Mission Space

22. To summarise the description of the range of missions Future Maritime Forces may have to undertake, and to simplify the conceptualisation of *'what'* Future Maritime Forces may be required to do, the concept of the Maritime Mission Space and the following diagram have been developed. The Mission Space has been divided into four mission quadrants, grouping tasks with similar characteristics in terms of the tactical and strategic environment, the operational skills and capabilities required, the intensity and duration of combat engagements and the application of lethal force.
23. The first quadrant, Diplomatic and Assistance Operations, are those operations conducted in support of shaping the strategic environment and include shows of force, blockades, humanitarian assistance operations and international



engagement activities such as maritime capacity building, foreign defence force training and diplomatic visits. Law Enforcement Operations form the second quadrant and are those conducted in support of activities such as resource protection and combating transnational crime such as drugs, customs, immigration, quarantine and other illicit activities. Security Operations are where the ADF's principle role is to provide a secure environment within which Other Government Departments (OGDs) and non government agencies can deliver their services to achieve the national intent. This title was selected to reflect the ADF's security role, a whole of government approach and the potential primacy of OGDs. This quadrant contains missions such as peace and nation building. Combat Operations are operations where the ADF's role is to defeat an adversary through the application of lethal force; the adversary could be a state or non-state actor. For Future Maritime Forces this includes the projection of maritime power and exercising local sea control. All of the mission quadrants involve operations at home and abroad. For example Combat Operations may be undertaken in Defence of Australia, or as part of a coalition offshore. Enforcement operations may be undertaken within our own EEZ or in support of a failed state until it can enforce its own sovereignty.

24. The following diagram depicts the Maritime Mission Space (figure 1). It has blurred boundaries between the quadrants to reflect the complex and unpredictable nature of future warfare where maritime forces may have to rapidly transition between, or concurrently conduct tasks across the Mission Space. The diagram reflects the presence of lethal threats no matter what mission is being undertaken. The intensity, duration and warning time associated with each lethal encounter are expected to be the future variables, rather than whether a lethal threat is present or absent. The arrows radiating from the centre of the diagram represent the intensity and the duration of lethal encounters in each of the quadrants of the Mission Space.

Figure 1 -Maritime Mission Space



Maritime Projection Space

25. To determine 'where' future maritime forces are most likely to operate, the concept of the Maritime Projection Space has been developed. The description of the Maritime Projection Space attempts to illustrate the required strategic reach of Future Maritime Force capabilities. The Maritime Projection Space includes the littoral regions of all of the land masses within the boundary and encloses all of Australia's strategic SLOCs.
26. It must be noted that the space described pertains to the projection of maritime power; it is a subset of the joint force's projection space. It is also important to note that the delineation of the Projection Space does not preclude operations outside of it. The area described is assessed as being the most likely within which Future Maritime Forces will have to conduct operations. If future operations are required outside of this space, then it would be expected that the ADF would flex and adapt the capabilities of future force structure to meet the circumstances at hand.



Maritime Battlespace

27. To summarise and simplify the conceptualisation of the '*warfighting conditions*' under which Future Maritime Forces are most likely to operate, the concept of the Maritime Battlespace has been developed. The Battlespace has been divided into seven domains: space, air, sea surface, sub-surface, seabed, electro-magnetic and information.
28. Blurring of the Domains. The traditional conceptualisation of three distinct operating environments of Maritime, Land and Air is less relevant in the future as the boundaries between the domains continue to blur. Effects generated in one domain will have increasing potential for application in another and vice versa. Forces operating in each domain will have an increased ability to project power into another. In 2025, the forces operating from the maritime environment will significantly intrude into the land and air environments thus limiting the ability to separate friendly forces geographically. The converse is also true. This will require joint force integration and improved awareness across domains even in dispersed or large theatres of operation, and even more so in small or confined operating areas.
29. The remainder of this section describes the 2025 characteristics of the seven maritime operating domains that comprise the future maritime Battlespace.
30. **Space Domain.** The 2025 space domain will be characterised by an increased number of actors making the 2025 maritime battlespace more transparent. It is unlikely regional states will have dedicated space assets, but they will have access to space based products and could form military or financial alliances with space capable nations or corporations. Lesser capable states, non-state actors and media will have greater access to space via increasing commercial presence in space. An example is that prior to invading Kuwait in 1991, Iraq ordered overhead imagery from the French commercial space enterprise SPOT. The space-based threat to ADF forces from these players is anticipated to be limited to ISR. The threat to ADF and coalition space resources is anticipated to include jamming of communications, navigation and timing signals. Physical attack on satellites through missile systems and potentially ground-based lasers is possible. Regional nations will continue to depend on space for precision timing signals to facilitate navigation of missile systems. Space is already a domain of manoeuvre in that satellites can be re-positioned for ISR purposes and ballistic missiles use space in their trajectories. The increased transparency of space could reduce the warning times for attacks via the improved ISR capability of potential adversaries. Space will facilitate many opportunities for ADF maritime forces. Vastly improved ISR and communications capabilities, navigation signal fidelity and coverage are expected to be available to the ADF. These capabilities will play an increasing role in enabling the delivery of future maritime combat power. An ability to disrupt an adversary's space based communications and precision navigation and timing signals could provide an advantage in future conflict.
31. **Air Domain.** Both state and non-state actors will be present in the air domain. Media and non-combatants may also be present, complicating the air picture. State actors will be present via military fighter and maritime aircraft (fixed and rotary wing), Unmanned Aircraft Systems (UAS) for ISR and possibly carrying offensive weapons, hypersonic and other missile systems. States may also use state-owned, commercial aircraft for military ISR activities. The air above the open ocean will be dominated by state actors on both sides, with little involvement of non-state actors. Long range MPA and tankered fighters carrying high speed, long range missile systems are expected to be the principal threat. Non-state actors will be concentrated in the littoral regions via less technologically advanced missile systems and smaller UASs for both ISR and/or possibly carrying asymmetric weapons such as chemical and biological agents or small amounts of explosive. Non-state actors may continue to use both large commercial and small general aviation aircraft as offensive weapons. Operations in the littoral will result in a greater density of air traffic and will bring land-based anti ship and anti aircraft missiles and short range aircraft into play. Further, nonstate actors, media and other non-combatants will have greater opportunity to access areas where maritime forces are operating. Increased stand off ranges and stealth technologies will make detection of weapon carriers harder and reduce warning times. The presence of terrain will further complicate the air picture. These factors combined with the presence of small UASs and increases in the speed of missile systems and fighter aircraft will make reaction times to threats shorter. Early detection, classification and dissemination of air threats and a layered systems response integrating deception, unit and force signature management and hard and soft kill responses will be key to survival in a demanding air environment. This strategy of self defence is equally applicable across all domains. The capabilities being acquired by the ADF in the Defence Capability Plan will generate a similar level of threat for a potential adversary in terms of platform technology. Opportunities will arise for the Future Maritime Force through the superior application of systems of technologies. The ADF will be able to generate advantages in the air domain via the application of joint effects such as the force multiplication effects envisaged via the combination of the Air Warfare Destroyer, Airborne Early Warning and Control aircraft and the Joint Strike Fighter. Future Maritime Forces will have to generate responsive fires through the air domain in support of joint forces ashore and the air domain must serve as a line of communication from joint forces at sea to objectives ashore. The ability to generate effects in the air domain over land from the sea will offer opportunities for land warfare and manoeuvre.



32. **Sea Surface Domain.** The sea surface domain will see the presence of state, non-state and non-combatants, including media. The open ocean is expected to be dominated by state actors and commercial interests operating larger vessels. However, there exists a possibility for non-state actors to be present via the hijacking of a merchant vessel. It is more likely the only involvement of non-state actors in the open ocean will be the use of smaller vessels for transporting people and supplies. Maritime operations in the littorals will see the presence of all actors. State actors will be present via conventional surface combatants and high speed, missile attack craft. Operations in the vicinity of urban environments and growing global trade will see a large increase in traffic density. Non-state and state actors will seek to hide amongst non-combatant traffic. Terrain will play a greater role in the geography of the sea surface domain. While the sea surface will retain its utility for manoeuvre, geography will often constrain options for manoeuvre and disposition. Islands, bays, inlets and rivers will feature as sanctuary and sources of surprise for adversary and friendly forces. Archipelagic and international straits must be transited and form natural choke points of high threat. The surface domain now extends over the land as maritime forces generate the capabilities to deliver effects further inland. The traditional surface threat of ship-on-ship will principally manifest itself in a missile threat; this could include the arming of Unmanned Shipping Vehicles (USVs) with antiship missiles. The threat of small, high-speed, manned and unmanned boats employing explosives and man-portable weapon systems will continue to be a key consideration. USVs may offer opportunities to counter these threats as well as to assist in clarifying complicated surface pictures in the littoral. The sea surface domain must also include ships in port, as the asymmetric threat is omnipresent. The sea surface will increasingly provide an opportunity to facilitate land manoeuvre. The movement of large scale forces and heavy equipment will continue to rely on transportation by sea and the supporting points of embarkation and disembarkation that must be secured.
33. **Sub-surface Domain.** The sub-surface domain remains an opaque environment. It is probably the domain that lends itself to the greatest asymmetry and is the domain in which it takes the greatest amount of time to develop situational awareness (as it involves large volumes of water), moving stealthy targets and a cluttered sensor environment. State actors will dominate this domain. Conventional submarine capabilities with accompanying advanced propulsion, torpedo and missile systems significantly improve Sea Denial capabilities. In the open ocean submarine threats will be present. The threat becomes particularly dangerous in choke points and shallower, littoral focal areas. Non-state actors may be present in inshore areas via diver threats to ships alongside or very close to the shore. While some transnational actors have attempted to construct submarines to facilitate movement, it is unlikely that non-state actors will be able to project a credible threat other than has been described. The littoral will place greater emphasis on shallow water anti submarine warfare. Operations close to shore can solve some sub-surface problems by consolidating threat arcs. However, it exacerbates others by constraining the ability to manoeuvre to out position an adversary sub-surface threat. Therefore the ability to deny access to an operating area in the littoral will be extremely important. Improvements in sub-surface sensor technology and the speed and range of torpedoes will potentially make warning times even shorter than they are at present. Methods of pushing out detection ranges and denying submarines access to Future Maritime Force operating areas, such as with the use of sea mines, will be key to the success of future maritime operations. Maritime domain awareness of the location of adversary submarines from in port to deployed locations will also be a key force multiplier. The best place to kill a submarine is alongside in its home port. Improved acoustics and communications technologies will also present opportunities to address under sea surveillance challenges via networking underwater sensors. That being said, the under sea environment presents significant challenges for communications that must be overcome to enable networked, area denial systems. Future submarine forces must also contribute to the area denial effort to facilitate littoral operations. Uninhabited Underwater Vehicles (UUV) present opportunities to meet area surveillance and denial challenges and to develop a rapid understanding of the under-sea surface domain; an element of Rapid Environmental Assessment. The management of maritime platform and force signatures will present an opportunity to reduce the size of the area that needs to be denied, by deceiving and disrupting the adversary's targeting effort and reducing detection and classification ranges.
34. **Seabed Domain.**¹ The seabed domain is the most opaque and cluttered of the environments. Both state and non-state actors are expected to be present as technologies proliferate and become cheaper. Sea mines are excellent weapons of asymmetry, generating an effort to detect and remove them disproportionately greater than the effort required to lay them. The dominance of the littoral and the importance of the interface between sea and land will increasingly bring the seabed into play for the Future Maritime Force. Potential proximity to urban environments will bring maritime forces within reach of non-state actors using small boats to lay mines. The ability to bury and hide mines in the seabed geography make detection a difficult and extremely time consuming process, restricting manoeuvre and surprise. Future technologies will improve the explosive power and therefore lethal range of rudimentary and relatively inexpensive mine systems. This will permit mines to become smaller and harder to detect. Mines will also become a consideration in greater water depths further restricting manoeuvre and making mines a consideration in areas where they were once not a viable threat. Smart mines will increasingly have the ability to recognise magnetic, acoustic and pressure signatures and then act more like torpedoes pursuing a target at high speed. The confluence of UUVs and improved sensor technology will provide an opportunity to improve detection and elimination or avoidance of the mine threat in focal areas. Sea mines also offer an opportunity to protect friendly forces by denying access to an adversary's maritime forces, particularly submarines.

1 The Seabed Domain has been broken out from the Sub-surface Domain to ensure that the unique characteristics of the sea bed and mine warfare have sufficient emphasis.



Sea mines are a relatively inexpensive force multiplier. The seabed may also have future utility as a manoeuvre space, allowing for pre-deployment of mission modules into a theatre of operations and using the seabed as an offshore logistic warehouse.

35. **Electro Magnetic (EM) Domain.** The Electro-Magnetic (EM) domain will become increasingly crowded. State and non-state actors including commercial interests will crowd the RF spectrum in particular. State actors will exploit the EM spectrum for both offensive and defensive means. Nonstate actors are and will continue to use the domain as a communications medium leveraging the reach of mobile phones, satellite phones, the internet and commercial encryption technologies. Technologies are enabling increased rates of data transmission via bandwidth increases and data compression technologies. New data link technologies based on quantum physics may remove bandwidth limitations in the long term but are unlikely to do so in the next 20 years. Sensing (RF, optical, infrared, magnetic) and computing technologies, including those previously mentioned in the Space domain, are also making the EM domain more transparent. Whereas this domain has been one characterised by communications, ISR and denial activities, the future EM domain will also be characterised by the presence of offensive technologies including lasers and other directed energy weapons. Technology will play a significant role in this domain to enable the conduct of operations. Defending and attacking an adversary's use of the EM domain will grow in importance. The vulnerability of key nodes, reliance on communication relay systems to enable wide area operations and network defence/attack capabilities will be features in 2025 warfare. The EM domain will offer opportunities for Future Maritime Forces. Directed energy weapons may provide opportunities to rapidly knock down or blind missiles and small fast surface targets. The development of non-lethal weapons may provide future commanders and governments with a greater number of options to achieve military effects. Improvements in soft kill technology, combined with computing technologies that permit integration and sequencing of defensive systems, should improve the ability of soft kill to contribute to defeating missile threats. The ability to manipulate the EM environment has the potential to contribute to the management of unit and force signature management. While considered a low possibility, there exists the possibility that Future Maritime Forces and their systems may have to be able to survive an Electro Magnetic Pulse resulting from a nuclear detonation if part of a coalition force.
36. **Information Domain.** The information domain spans the battlespace. Previously perceived boundaries between sea, land and air environments must no longer exist if joint effects are to be effectively delivered and power projected from the sea onto and over the land. All actors are present in the information domain not only from the perspective of exchanging information between their own forces or entities, but also in shaping the conditions under which future forces will operate. Technologies are enabling higher data transmission rates across greater distances, the limitations in the water column being acknowledged. Greater amounts of information are becoming available, management of the flow and organisation of that information will be a challenge. Networking technologies enabling information grids are envisaged underpinning future warfare. The technological capability and the myriad of communications paths available to allied forces represents a potential fighting edge, albeit this will diminish as other states access enabling technologies such as satellites and high capacity, secure networks. However, this capability also presents a potential vulnerability. Quantum computing technology has the potential to break conventional numerical encryptions very rapidly. While it is not likely to be available to a non-state actor, large technologically advancing state actors may have this capability around the 20 year time frame. The security of information and its pathways within the domain will be a key consideration for future maritime operations. The Information Domain must be able to deal with shortened warning times and to communicate the presence of asymmetric threats and other fleeting targets in time to permit an engagement decision to be made. Additional links to management information will be in place so that information relating to, training, individual readiness and maintenance availability can be integrated into course of action planning. Shaping the information domain will be very important when operating in the littoral and close to urban environments. Shaping activities, or Information Operations, have the potential to clarify complex operating pictures by encouraging non combatants to not become involved and thus reduce the asymmetric threat. This strategy has the potential to increase the freedom of manoeuvre of FMF and improves force protection. The exploitation of the information domain must have a single focus, to enable warfighting decision superiority.
37. The articulation of the Maritime Mission Space, Projection Space and Battlespace framework completes the description of the future maritime warfighting problem. The next section of the FMOC asserts, in broad terms, the capabilities the future ADF maritime force will require to be able to effectively respond to that problem. FMOC 2025 asserts that future ADF maritime forces will deliver joint force effects by projecting maritime power and exercising local sea control in specific areas for specific times to facilitate the achievement of future ADF warfighting objectives.



FMOC 2025 -PART 3

MARITIME FORCE PROJECTION AND CONTROL

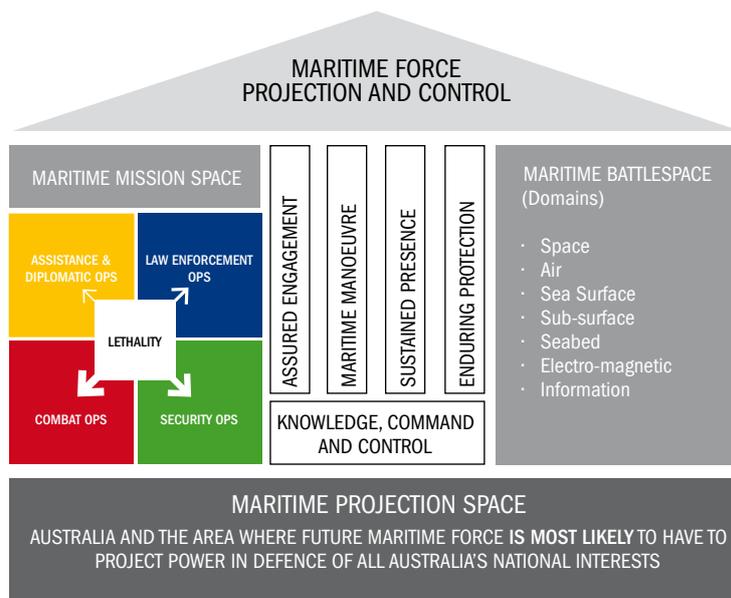
- 38. The following part describes how future ADF maritime forces will deliver combat power in response to the future warfighting problem. To assist capability developers in determining the size and shape of the Future Maritime Force, a future maritime capability goal for 2025 is also articulated.
- 39. **Future ADF Maritime Capability Goal - 2025.** The future capability goal of ADF maritime forces in 2025 is to be able to generate and sustain a balanced, adaptable and agile joint maritime force capable of projecting force and exercising local sea control across both open ocean and littoral maritime environments in a battlespace characterised by multi-faceted, symmetric and asymmetric threats. Concurrently the Future Maritime Force must be able to contribute to whole-of-government national tasking to protect Australia's maritime resources, borders, ports and sea lines of communication and ensure maritime safety and freedom of navigation.

FMOC 2025 ASSERTION

To achieve this capability goal across the Mission Space, throughout the Projection Space and under the conditions envisaged in the future maritime Battlespace, FMOC 2025 asserts that the ADF's Future Maritime Force, acting independently or as elements of a combined force, will be required to project force and gain local sea control from home port, across open ocean SLOCs, through choke points and across the littoral. Collectively, the operating concept supporting the delivery of the assertion is titled Maritime Force Projection and Control.

- 40. Maritime Force Projection has utility in the degree to which force can be implied or threatened, as well as asserted. It is therefore a tool that has utility across the mission space. The other equally important element of the FMOC 2025 assertion is sea control. To an increasing degree in 2025, sea control will also include space based assets and land based elements in the littoral.

Figure 3: Overview of FMOC 2025





41. Five Maritime Capability Enablers underpin the ability to project force and exercise local sea control in 2025. These are Knowledge, Command and Control (KC2); Assured Engagement (AE); Maritime Manoeuvre (MM); Sustained Presence (SP); and Enduring Protection (EP). The key maritime capability enablers are illustrated within the FMOC context in the above diagram which shows the Mission, Projection and Battlespaces bounding the future warfighting problem and the MCEs combining to deliver the FMOC assertion of Maritime Force Projection and Control. KC2 underpins the other four MCEs emphasising the pervasive nature of knowledge, command and control across all the things that the Future Maritime Force will do. The remainder of this Part describes each of the MCEs and their enabling elements.

MARITIME CAPABILITY ENABLERS

Knowledge, Command and Control (MCE 2025-1)

42. The KC2 MCE aims to enable the ADF to make superior decisions. Without effective KC2 the capabilities delivered by the other MCEs cannot be effectively orchestrated and brought to bear to generate a fighting edge. KC2 extols enhanced situational awareness and adaptive command and control (C2) to effectively deliver future maritime combat power.

Knowledge, Command and Control is the exploitation of superior battlespace awareness and, through people, innovatively applying operational art and adaptive command and control to gain decision superiority over an adversary.

43. A central element in achieving a KC2 advantage is the ability to conduct multi-tier Network Centric Warfare (NCW). NCW derives its power from effectively linking or 'networking' the conduct of warfare not the network itself. NCW treats platforms as nodes of a network that are securely and seamlessly connected. Information is collected, shared, and accessed to produce a common recognised operating picture available to all nodes of the force, which in turn allows a greater level of situational awareness, coordination, and operational potential.

Knowledge

44. Knowledge includes both awareness, or sensing, and understanding. Knowledge consists of three key elements: own forces, the adversary, and the battlespace. KC2 provides knowledge to effectively make and implement more timely and informed decisions than the adversary. The effectiveness of the maritime force can be improved through information and decision superiority (quality and speed). Integral to achieving decision superiority is a robust system that is protected from offensive information operations by providing information assurance and data integrity.
45. **Own Forces.** Knowing how to exploit our own warfighting systems to their full potential provides an advantage. A high standard of professional training and operational analysis increases both 'self' knowledge and the ability of combat units and groups to survive the most challenging circumstances to achieve mission success. While computer processing will facilitate improved fidelity simulation by 2025, live training in realistic circumstances will still be necessary. Simulation will permit enhanced training but will not replace real manoeuvre opportunities, as the human element will above all else decide military success. However, what will be possible is real time mission planning and simulated execution of operational plans to analyse potential courses of military action.
46. While a significant investment in appropriate technology will provide some niche capability edges, military personnel serving in an adaptive and flexible fighting force will need multi-skill training that is as deep as it is broad to exploit the ADF's warfighting potential. Harmonising military machines with their human users through optimised human machine interfaces will be key.
47. The ability of own forces to respond to evolving threats within shortened warning times and contribute to the joint mission requires real time awareness of the disposition and state of own forces across the maritime battlespace, material and logistic states, such as fuel, water and ammunition. Supporting combat forces that are fast moving, adaptive and flexible will present challenges to sustaining force presence at distance. Timely logistic support delivered to the combat force is a critical enabler, which will be aided by command support systems that have an embedded logistic function.
48. **The Adversary.** Effective intelligence is a crucial enabler that identifies operational risks, threats and opportunities and provides essential support to strategic, joint contingency and operational planning. To be effective, intelligence support must include emphasis on relevant forward areas of the battlespace in order to identify, monitor and analyse potentially threatening or destabilising developments.



49. Fusion of multi-source intelligence data to produce a coherent picture for the joint force is derived from reconnaissance, signals intelligence, human intelligence, electronic intelligence, and communications intelligence, typically from forward-deployed platforms, many of which may be maritime elements. By 2025, satellites and uninhabited vehicles, some of which may be organic to the joint task force, will act as forward intelligence collectors.
50. The future ADF maritime force must have the capability to collect intelligence and, after analysis and robust correlation, provide the information to the joint force for the conduct of operations.
51. Superior knowledge is more than good intelligence. It encompasses an understanding of an adversary's society and culture, military capabilities, intentions, activities, and operations. This requires study of the potential adversary in advance of potential operations. Preparation of the battlespace from an intelligence, surveillance and reconnaissance perspective in 2025 should be considered an advance force operation.
52. **Battlespace Awareness.** For maritime forces effective battlespace awareness is critical. Maritime engagements will arise within reduced warning times, involve the application of tailored lethal force and be against adversaries presenting fleeting engagement opportunities who are increasingly difficult to detect, target and engage. In 2025, the battlespace will be both dynamic and complex. The possibility for asymmetric threats to surprise maritime forces will evolve. Maritime, land and air environments will be less discrete and combat actions will transcend environments creating effects across the battlespace. There will be a growing importance for a comprehensive awareness system to de-conflict own forces and their operations and how these may influence an adjacent environment. As such, the intelligence and operational pictures must be fused.
53. Surveillance activities must be able to be conducted ahead of and in-stride with the maritime force. They must inform the force while minimising the potential of compromising own force intentions and disposition.
54. The ADF's ability to undertake surveillance operations is important against surface, sub-surface and air targets. Fusing raw sensor data to detect low observable targets will be a vital capability. In areas of high threat, such as the approaches to an adversary's forward operating base, amphibious operating areas and natural focal points, low observable uninhabited vehicles provide an alternative asset for reconnaissance and surveillance. In instances where manned maritime force platforms are employed for surveillance, and must therefore come within close proximity of the adversary they will require comprehensive self-defence capabilities. Future UAVs will also require a level of self protection. Expendable UAVs may be required in some high threat scenarios.
55. In 2025, reconnaissance of each maritime domain, with perhaps the exception of the sub-surface and seabed domains, is likely to be less technically challenging. Technological advances will make it more difficult for surveillance assets to close with an adversary without detection. Space based or high altitude reconnaissance systems that are less vulnerable to adversary countermeasures will be useful. To gain certain types of information not possible through wide area surveillance, some ISR systems will need to be in close proximity to the adversary and will therefore need to have low observability as will the platform that inserts, supports and extracts these systems. Stealth, material technology and signature management and deception technologies will need to be leveraged to meet the future surveillance challenge.

Command and Control

56. C2 systems must be able to deliver superior battlespace awareness and management through decision speed and quality thus controlling operational tempo. Connecting the sensor, information and engagement grids through the C2 grid will allow better cohesion within a constituted force, as all elements are more acutely aware of the commander's intent and directions. Each element will also be better informed of actions being conducted by another element, which will facilitate dynamic deconfliction of effects rather than using inflexible procedural systems. It will also need to support the commander when faced with uncertainty at the tactical, operational or strategic levels, allowing them to act decisively. This produces a requirement for multi-level C2 that can also be adapted to potentially provide direct control from the national command authority to a maritime force element for specific and sensitive missions if that were appropriate.
57. Integration of the three Services in a joint operating environment is vital to mission success and the seamless force. This will require effective exploitation of information technologies and selected adoption of allied standards to ensure interoperability when operating with coalition forces. The maritime force must also develop a high level of interoperability with likely coalition maritime forces and future architectures must provide a cohesive and comprehensive system through NCW to achieve complete battlespace awareness and control.
58. The NCW concept will have been in existence for about 20 years in 2025 and should be mature enough to provide a suite of command capabilities and connectivity for most platforms. This should reduce the need for complex command structures and could manifest itself in flatter structures with greater autonomy being delegated to lower level commanders because they have access to the information they require. The C2 system in 2025 should also provide greater scope for individual commanders to exercise initiative, enabled by superior battlespace awareness.



59. The Future Maritime Force will need to be networked with the assured access to knowledge and information databases when required within the necessary time frames. Access and assured connectivity across the continuum of tactical, operational, and strategic levels, (including support activities) must facilitate C2 of maritime, other ADF and combined forces from the maritime environment. Basing C2 at sea provides an ability to project a joint force in the littoral at distance without dislocating the commander from the battlespace. This will be an essential feature of KC2, particularly in supporting joint forces ashore.

Enabling Elements

60. The following enabling elements support KC2:
- a. **Flexible Communications and C2 Framework (2025-1-1).** A Flexible Communications and C2 Framework involves a redundant communications architecture and high data rate communications generated by combining increased bandwidth, improved data compression technologies and information management systems. It would also include measures to enhance the quality and durability of communications, including network protection. Communicating across the joint and coalition force and with other elements of government especially law enforcement and disaster relief agencies will be necessary. The C2 and communications framework must be robust enough to support interoperability with allied forces and the conduct of high-tempo combat operations. The framework must also be flexible enough to be able to adapt to accommodate operating with coalition partners.
 - b. **Multi-tier NCW (2025-1-2).** In order to integrate C2, information, sensor and engagement grids; maritime forces will require a multi-tier NCW architecture with gateway units providing links to higher and lower level coalition forces while maintaining a secure networked national framework. For NCW to be effective, appropriate system integration across ADF platforms and units and OGDs must provide the high level of interoperability that the complex future operating environment will demand.
 - c. **Battlespace Awareness (2025-1-3).** Battlespace awareness deals with the non-physical aspects of understanding and monitoring the battlespace. Capabilities such as intelligence collection and associated analysis in support of signals, human, electronic and communications intelligence provide a significant ability to pre-empt the adversary. Battlespace awareness also involves the deployment, support and extraction of surveillance and reconnaissance systems, including forward deployed uninhabited sensors and those remote from the battlespace to detect, classify, and track air, surface (including land) and sub-surface targets. The 2025 battlespace will require persistent, forward ISR ahead of and in-stride with the force to maximise warning times. In the 2020-2025 time frame it is anticipated that small nano-technology sensors will become available, allowing superior and undetected surveillance of the battlespace.
 - d. **Battlespace Management, Command Decision and Support Systems (2025-1-4).** Battlespace awareness and management are clearly linked. The future ability to create effects in the land and air environment from the maritime environment will demand force integration and synchronisation, and joint fire coordination and de-confliction. This creates a KC2 requirement to dynamically manage the battlespace. An automated deconfliction system to approve fire support will be key when responding to unexpected threats that will emerge with little notice from a complex environment. The ability to support command decisions through faster than real time simulation will decrease operational risk in planning stages. Systems that support command decisions and assist awareness of the battlespace support requirements will also be key to enabling multi-dimensional manoeuvre envisaged in the Future Warfighting Concept².
 - e. **Rapid Environmental Assessment (REA) (2025-1-5).** A key element of KC2 that contributes to generating a fighting edge is a detailed knowledge of the physical aspects of the battlespace. This requires the collection, assimilation and assessment a range of hydrographic, oceanographic, topographic, meteorological and other environmental information. This information must be provided to commanders to support both the planning and execution of operations, therefore REA comprises two integral parts. The first part consists of the retrieval and assimilation of historical data, products, literature and imagery to support operational planning and command briefings. The second part involves the collection of current, temporal and perishable environmental data that addresses gaps in historical databases and provides up to date information in support of the execution of operations. It is essential that this information is collected, both in-stride and ahead of the joint force and rapidly disseminated.
 - f. **Integrated Operational Training (2025-1-6).** To improve the knowledge of own forces and fully exploit the suite of ADF and other government agency's capabilities, comprehensive and integrated training potentially provides an operational edge. Real time mission simulation, detailed operations analysis, distance education systems and opportunities to learn from the experiences of other forces will enhance the capability of maritime force personnel. It should be noted that while simulation will permit enhanced training, it will not replace field training and live fire activities under realistic conditions.

2 Department of Defence 'ADDP-D.3 - Future Warfighting Concept', Canberra, 2003, p 23.



Maritime Manoeuvre (MCE 2025-2)

61. The ADF aspires to a multi-dimensional manoeuvrist approach for the conduct of operations.³ In part, this is driven by the necessity for a small to medium size combat force to achieve disproportionate effects while avoiding attrition. The manoeuvrist concept is based on using an indirect approach to defeat the adversary's will and aims to destroy an enemy's ability to fight as an integral force, rather than by destroying the force through attrition.⁴ Maritime force elements that are inherently adaptable and flexible are required to conduct combat missions and be able to adapt to concurrently support other activities such as law enforcement missions.

Maritime Manoeuvre is the capability of maritime forces to move freely in and between the open ocean and littoral environments and to project force through exerting local sea control to facilitate the delivery of support to the joint or combined mission.

62. Future Maritime Forces must have the ability to leverage the sea as a littoral manoeuvre space in support of joint operations ashore. The conduct of littoral manoeuvre with fire and logistic support of land forces based at sea requires highly coordinated joint combat power. The development of sea based land attack weapons, such as land attack missiles and extended range gun munitions, will allow maritime forces to responsively support manoeuvre ashore at considerable distances. This will necessitate joint force integration and cross domain awareness.
63. **Open Ocean.** Space, air, surface, sub-surface, seabed, EM and information domains in 2025 will all harbour sensors and weapons capable of limiting or neutralising a maritime task force's ability to achieve assigned missions. As such, within each maritime force, an ability to control adversary activities in each of these domains will be necessary. Abilities of maritime forces to defend against threats and also to engage targets that will emerge from each domain provide the constituents of the Future Maritime Force. Not having capabilities to do so will render a maritime force vulnerable and capable of being exploited by a future adversary. While there is a focus on the application of manoeuvre in the littoral, FMOC 2025 contends that the ADF must also be able to exert local sea control in the open ocean and manoeuvre freely across SLOCs to the Area of Operations (AO). It provides advantages in increased freedom of action, reduced detection from surveillance assets and improved offensive and defensive engagement effectiveness.
64. **Littoral.** The application of maritime manoeuvre in amphibious operations creates a priority for speed, responsiveness and mobility. The emphasis of delivering maximum combat power using the smallest possible, mission configured force is consistent with manoeuvre warfare. This in turn would allow forces to be based at sea for maximum poise and responsiveness. The concept allows forces to be inserted close to or at the operational objective, and later be rapidly extracted and if required, redeployed to subsequent objectives using the maritime environment as a joint force manoeuvre space. Amphibious operations require synchronised and integrated forces. Collective training in support of amphibious operations will play an increasingly important role in the generation and projection of maritime power in the littoral.
65. Projecting a land force from a distance will naturally limit the combat tempo and generation of mass ashore. Such an option is only viable if high speed connectors and effective joint fires can be assured. This has significant implications for maritime forces where calls for fire support will need to be exceptionally responsive, tailored and precise. Another important implication of a compact land force configuration, as envisaged in the Future Land Operating Concept (FLOC), is a smaller C2 and logistic footprint forward on the battlefield and therefore greater command and sustainment requirements based at sea. These two themes require considerable joint force integration, with greater emphasis on maritime forces providing sustained offensive and defensive fires, manoeuvre and logistic support. Basing forces from the sea also has utility in assuaging ABO issues, using the freedoms of the sea to facilitate ADF manoeuvre.
66. In the FMOC 2025 context, it is envisaged that the level of sea basing will allow a scalable Deployable Joint Force Headquarters (DJFHQ) to operate afloat and subsequently seamlessly transfer command of joint forces ashore when appropriate. It is anticipated that some traditionally land-based tactical ISR, lift and airmobile borne force support assets are likely to operate from sea based platforms in the early stages of an operation.

Enabling Elements

67. The following enabling elements support MM (tabulated at Annex B):
- a. **Future Maritime Manoeuvre (2025-2-1).** This enabling element considers the ambitions of the joint land and air forces for complex and expeditionary warfare and integrates them with the maritime elements that enable these aspirations. Amphibious warfare is the most complex proposition for future ADF combat power development to 2025. Preparing the battlespace by establishing local sea control, deploying joint combat elements ashore, supporting them and then extracting them to manoeuvre or at the cessation of operations will require at least two

3 Ibid.

4 Ibid.



significant task forces; one amphibious task force and one strike force. The amphibious mission of deploying a brigade size force will occupy the vast majority of Australia's maritime combat power, even if the adversary is only capable of small-scale denial operations.

- b. **Assured Access (2025-2-2).** Future Maritime Forces tasked to project power and exert control will require capabilities that enable assured access to objective areas for both the delivery and extraction of joint forces. In addition to knowing the physical characteristics of the battlespace through REA to enable maritime manoeuvre in the open ocean and the littoral, maritime forces will also need the capabilities to fight for access, defeating denial systems in order to be able to exert local sea control. Inherent in exercising local sea control, Future Maritime Forces must also have the ability to deny the adversary access to the area of operations.
- c. **Sea Basing (2025-2-3).** Obtaining host nation access in support of a Forward Operating Base from which to mount ADF operations is not assured. Infrastructure in regional nations is often insufficient to support combat operations at the desired tempo. Obtaining third country access in support of air lift operations at long distances from Australia also cannot be guaranteed. It often takes considerable time to obtain host nation access, with an uncertain security environment forces may have to be deployed inside the time frames required to negotiate access. Sea basing provides a means of maintaining a joint combat presence, the ability to manoeuvre and support operations in the face of a lack of access, basing and overflight rights. Long SLOCs produce difficult to defend links between Australia's national support base and the AO and generate potentially long lead times for the delivery of logistic support. Embedding logistic support requirements for reasonable operational viability periods within the Joint Task Group (JTG) at sea can assist in mitigating the risks generated by these issues. The Future Maritime Force must be prepared to operate across the Projection Space and not necessarily be reliant upon third country access as an enabler for operations.

Assured Engagement (MCE 2025-3)

- 68. Assured Engagement provides the means for engagement of future targets at sea, in the air and ashore across the Battlespace. Future targets are expected to be more elusive, have shorter targeting exposures and require a range of tailored engagement responses when applying lethal and non-lethal force.

Assured Engagement is the capability of maritime forces to decisively engage target sets across the battlespace using networked systems to provide the required responsiveness, weight of fire, precision and assure success by employing lethal and non-lethal weapons.

- 69. In the 2025 battlespace, engagement integration of maritime, land and air targets must be enabled by clear battlespace awareness and management systems supported by C2 that is highly responsive. De-confliction to allow the engagement of targets that have a short exposure or are close to own forces will be essential.
- 70. The engagement grid should include the use of lethal and non-lethal systems made possible by exploiting emerging technologies. Consistent with Multi-dimensional Manoeuvre (MDM), the aim of engagement is to destroy an adversary's ability to fight as an integral force.
- 71. The capability of maritime forces to strike targets at sea and ashore can be enhanced through the availability of systems with increased range, speed, precision and responsiveness. In addition, a greater emphasis on training and sensor-to-shooter integration through NCW has potential to significantly increase operational effectiveness.
- 72. Although a balanced maritime force may provide engagement system redundancy, it will remain essential that each element has internal system redundancies that can still provide mission capability after suffering damage. Being a small to medium sized force, with little depth each maritime platform must have offensive system resilience.
- 73. During the 2005-2025 timeframe, computer-processing power will enable rapid engagement simulation in near real time. This could allow simulated testing and modelling of engagements to produce the optimal solution before committing to live fire. However, the application of this type of process will very much depend upon the time available within the engagement cycle.
- 74. Future weapons will need to be highly responsive to short notice threats, particularly in support of compact land forces. They must be connected to the engagement grid, and have variable yields in order to match the weapon to the desired effect to be created. Accurate and timely Battle Damage Assessment (BDA) is required to ensure that scarce weapon resources are not wasted via unnecessary re-engagements.



Enabling Elements

75. The following enabling elements support Assured Engagement (tabulated at Annex B):
- a. **Space Warfare - (2025-3-1).** In 2025, maritime forces may be required to contribute to theatre ballistic missile defence. It is unlikely that maritime forces will need to conduct any other warfare in space, relying on coalition forces if necessary. Risk mitigating systems and tactics options that address the potential disruption of space based enabling C4ISREW and weapon/engagement services will also be required.
 - b. **Maritime Joint Fires (MJF) - (2025-3-2).** MJF is the integrated employment of available maritime based sensors and weapons (including coalition) for projecting effects onto the land environment. It includes weapons such as organic land attack weapons carried by maritime, land and air forces. MJF may be in support of strategic strike or joint fire support to land forces. Of growing importance will be the capability to defend against highly mobile and rapidly moving, elusive land targets. Responsive and scalable weapons systems are required to enable targets to be engaged in support of land forces within the required time frame and to apply the appropriate amount of force to facilitate either control operations or joint land manoeuvre.
 - c. **Networked Maritime Air Warfare - (2025-3-3).** In order to meet the challenges of super and hypersonic missile threats that employ sophisticated multi-sensor seekers, ADF maritime forces must be able to fuse multiple sensor information to detect low observable targets and conduct automated engagement coordination using multiple channels of fire. To effectively conduct littoral manoeuvre and support land operations, ADF maritime forces must be able to engage air targets over land. This requires improved over land sensor performance and the introduction of active sensor weapons, where a third party, such as AEW&C or a suitable ground-based sensor provides third party targeting information.
 - d. **Networked Surface Warfare (NSW) - (2025-3-4).** NSW is the combined application of joint sea, land and air combat power against hostile surface forces in both the littoral and open ocean. This requires a high degree of battlespace awareness, target discrimination and weapon coordination. One tenet of NSW is the need to be able to match a weapon against a threat to achieve optimum efficiency.
 - e. **Networked Sub-surface Warfare - (2025-3-5).** There is considerable potential by 2025 for anti-submarine forces to achieve tactical ascendancy through the use of high quality surveillance. Networking of systems would increase detection and tracking opportunities, a key to ASW success. Successful networking would improve counter-mining operations and environmental assessments.
 - f. **Seabed Warfare (SW) - (2025-3-6).** In 2025, the seabed will be the most complex domain that an adversary (conventional or non-conventional) may use to deter or destroy maritime forces. Surveillance and disposal of sea mines and other seabed-based threats is a time intensive and complex task. Deploying mine warfare assets ahead of the main force is the conventional way to ensure safe passage of mission essential units.
 - g. **Network Warfare (NW) - (2025-3-7).** This overarching enabling element involves a range of measures to exploit the adversary's use of the EM domain and information systems and control the EM domain to assure our use of it. It includes Electronic Countermeasures that neutralise an adversary's ability to command, control or communicate with his forces.

Sustained Presence (MCE 2025-4)

76. It is assessed that in 2025 resource constraints will limit the size of ADF maritime forces and the redundancy of a supporting maritime force such as replenishment vessels. Other pressures on force flexibility could be sustaining commitments over a period of years and maintaining this while other short term concurrent operations compete for maritime forces. For the Future Maritime Force the pressures on raising and sustaining the required people may become even more demanding due to prevailing demographic trends

Sustained Presence is the ability to sustain adaptable and flexible maritime forces throughout the Projection Space.

77. In support of Maritime Manoeuvre, the logistic part of Sustained Presence occurs at two levels: inter and intra theatre. To project maritime force and exert control at distance will require a national support base. Maritime connector's will be required at both operational and tactical levels. It will be important to ensure that lift capacities throughout the logistic train do not bottleneck support, thereby limiting the ability to sustain a presence and conduct Maritime Manoeuvre. Sustained Presence also embraces a broader sustainment proposition that includes personnel, system design issues, and infrastructure development.



78. The Sustained Presence maritime capability enabler is significant in the joint context and is responsive to the demands of joint land and air forces ashore. A lethal and uncertain future environment ashore sees the Future Land Operating Concept (FLOC) anticipating reduced logistic footprints ashore and the basing of more logistic support assets and services at sea. Maritime assets can provide a persistent presence without relying on host nation access as discussed earlier in the Sea Basing enabling element.

Enabling Elements

79. The following enabling elements support Sustained Presence (tabulated at Annex B):
- a. **System Design Initiatives (2025-4-1).** There are a range of measures that individually and collectively will enhance the future force's sustained presence in an AO, these include:
 - i. Increased system redundancy and commonality through the force.
 - ii. High endurance of platforms, including the use of alternate propulsion systems.
 - iii. Flexible designs that permit operation of platforms across the wide range of environmental conditions expected across the Projection Space.
 - iv. Uninhabited systems and remote sensors/weapons.
 - v. **System Commonality of Support Forces.** For a medium to small sized Navy, support forces that enable the full range of operations anticipated in the mission space will require versatility.
 - vi. **Alternate Force Mixes.** The sustainment of maritime forces may be enhanced if role adaptable/specific medium or high-speed vessels support the core force of major surface combatants and large auxiliaries. These lower capability vessels could provide a resource efficient means to undertake missions in the lower end of the operational spectrum. An opportunity to take up ships from trade, or more likely lease within required notice levels, may provide the necessary lift required.
 - b. **Responsive Logistics (2025-4-2).** Critical to Sustained Presence is the capability for responsive logistics. This includes inter-AO and intra-AO logistics. Ensuring that 2025 warfighting ambitions or schemes of manoeuvre are enabled by responsive logistics and support forces that can lift and deliver anticipated stores into and out of the AO is required. Casualty management is also important. Sustained presence requires a national support base that is capable of providing:
 - i. responsive support services; and
 - ii. an ability to conduct critical battle damage and system failure repairs in the Area of Operations.
 - c. **Personnel Related Initiatives (2025-4-3).** A sustainable core group of trained and prepared personnel available to each maritime force element to meet military response option requirements is needed to allow maritime forces to respond to unexpected contingencies while deployed. Alternative and flexible crewing arrangements and the optimum use of RAN, RANR, APS and contractor personnel provide opportunities to meet operational and contingency demands. Force protection against asymmetric threats is expected to remain a significant issue for Future Maritime Forces in 2025. The complements anticipated in future maritime units may not be able to provide for enduring force protection requirements. The ability to deploy supplementary land or maritime force protection units would provide the necessary capacity to ensure the required level of force protection is afforded to maritime units in all environments and circumstances.

Enduring Protection (MCE 2025-5)

80. A small to medium sized force such as the ADF has a limited number of platforms and units it can deploy, rotate or replace. The future battlespace will see an increased presence of lethality across all missions, shortened warning times for threats and an increase in transparency and subsequent reduced ability to hide. Further, forces ashore may be more dependent on the JTG at sea, if the maritime JTG suffers large degradations in capability due to battle damage, this also potentially exposes the joint force ashore. Therefore the preservation of combat power within the Future Maritime Force is a key requirement to be able to effectively and reliably project force and exercise local sea control. Further, to achieve this objective the Future Maritime Force must attempt to disrupt an adversary's targeting cycle at every opportunity.

Enduring Protection is the ability of each maritime force element and the JTG to successfully achieve designated missions and tasks through the combined capability of defensive power, staying power and fighting power. It allows a unit to deflect attacks, absorb damage if necessary, and be able to counter attack.



81. The Enduring Protection of a maritime force describes its ability to defend against attack, survive the damage inflicted by an attack and subsequently counter-attack. The employment of each maritime force element within the maritime JTF determines its capability requirements for each of these three aspects of Enduring Protection. Enduring Protection asserts that every maritime force element must have a level of survivability and self protection against a threshold set of threats and must contribute to a layered approach to force protection and the preservation of maritime combat power within the future maritime JTG
82. Defensive power can be viewed two ways. Maritime forces that have a low risk of detection or targeting by an adversary have inherent defensive power. Submarines and mines are clear examples. This is a force multiplying effect, as fewer elements are required to provide force protection, and can be re-tasked or kept in contingency reserve. The disproportionate effects created by clandestine capabilities support this theme.
83. However, maritime force projection and control implies an ability to deploy, lodge, support and extract land and air forces. Hiding will be less feasible in 2025 for surface units and maritime aircraft that are unable to use the opaque nature of the water column and seabed. The burden for protection against attack must therefore be resident in the maritime force. The ability to conduct force level anti-air, anti-surface, anti-submarine, counter mine and nuclear, biological and chemical defence is a critical attribute of the Future Maritime Force. Ensuring commensurate protection capabilities are in place should also include the range of asymmetric threats. Additionally, reducing the possibility of detection, targeting and engagement of all force elements through signature reduction has the potential to reduce the overall capability bill for protection of the force. For example, the ability to conduct clandestine pre-cursor operations leading to an amphibious landing will derive many operational advantages. REA and mine clearance operations that can remain undetected do not require broader force protection, and importantly, an adversary is not warned of impending operations
84. Staying power includes the ability to recover from damage due to attack and graceful system redundancy. While each force element should have some fighting power redundancy, the maritime force as a whole should have inherent capability redundancy as each element complements others.
85. People are the most important element of future combat power. It is therefore critical that combat power be preserved by preserving people capability within the Future Maritime Force. Comprehensive damage control and safety systems and hardened and survivable platform designs must contribute to people having a reasonable expectation of surviving battle damage. Where practicable and affordable, uninhabited systems are a capability option that significantly reduce the risk of casualties.

Enabling Elements

86. The following enabling elements support Enduring Protection (tabulated at Annex B):
 - a. **Platform and Force Signature Management (2025-5-1).** Limiting the opportunity for an adversary to locate, target and engage maritime forces is enabled through broad-spectrum signature reduction. Force signature management can also be managed to confuse the adversary's targeting problem and possibly make the adversary expose themselves to a greater risk of detection and engagement. For example, common Low Probability of Intercept (LPI) radars make it difficult for an adversary to localise high value units and identify the make up of a force. This is also consistent with the need to generate logistic efficiencies described in Sustained Presence.
 - b. **Platform Survivability (2025-5-2).** This element establishes the need for each maritime force element to survive a minimum threshold level of threat. Ensuring that each maritime force element can withstand an attack through hardened design features, system redundancies, and damage control capabilities especially in minimum manned units will be a priority. Future Maritime Force platforms will require greater survivability depending upon their role in the task group.
 - c. **Force Protection (2025-5-3).** Maritime forces will require a force protection capability to counter asymmetric attack to varying scale at all times. Further, a maritime force element's ability to contribute to the protection of other elements of the force, including land and air force elements, and other agencies in the immediate battlespace, must be measured against the contribution of the unit to the overall mission. A unit that does not contribute to overall protection of the force and is not a mission essential unit provides limited utility to future maritime combat power. Similarly, land and air operating concepts should consider the ability to contribute to maritime force protection against both conventional and asymmetric threats.



APPLICATION OF FMOC 2025

87. This FMOC asserts that Future Maritime Forces will be required to conduct operations across the Mission Space, project joint maritime force throughout the Projection Space, with an emphasis in the region, and exert local sea control. Operations within the mission space include combat, law enforcement, security or diplomatic and assistance missions or a combination of these missions concurrently. Whatever the nature of the operation, the maritime force must be capable of moving freely within that area of the battlespace required to achieve ADF warfighting objectives, that is exert local sea control in both time and space. These operations could take place anywhere in the projection space, with a scale of maritime force commensurate with the available force projection and control capacity.
88. Considering combat operations first, extraordinary circumstances may require maritime forces to:
 - a. break out from protected Australian ports;
 - b. amphibiously lift a combined arms battle group and associated support equipment, providing safe transit to a battlespace;
 - c. lodge that force in an adversary's territory after establishing local sea and air control; and
 - d. continue to maintain a presence providing C2, fire and logistic support prior to extracting that force.
89. Another lesser commitment of maritime forces to combat operations may involve contribution to a coalition force protecting a sea lane of communication.
90. Security operations may include near warfighting conditions during the evacuation of non-combatants from a nation that has descended into civil unrest or civil war. They may also be much smaller in scale and only require maritime forces to provide a base at sea for a security response force which can be deployed quickly to restore law and order.
91. Law enforcement operations will be diverse, but would include at each end of the spectrum the potential for resource protection in the Australian Antarctic Territory or surveillance and interdiction operations of Australia's Economic Exclusion Zone against illegal fishing in concert with Air Force and civil agencies.
92. Diplomatic and assistance operations are well supported by maritime forces as engagement with other maritime nations creates opportunities for shared understanding and military/political dialogue. Providing local assistance could be as simple as several members of a ship's company conducting local infrastructure development by painting the village church/school house. In extreme circumstances, maritime forces may need to respond in cooperation with civil authorities to a WMD attack in a populated centre in Australia, or possibly overseas where the existing national response organisation has been destroyed or overwhelmed.
93. Wherever the maritime forces are operating in the mission space the key MCEs of FMOC 2025 are equally important and applicable, changing only in scale as the complexity and lethality of the operation changes.
94. In amongst all the possible missions that the Future Maritime Force may be required to respond to, the prevailing reason for being is to engage in combat operations. However, a growing number of other operational scenarios populate the mission space and require equal consideration when deciding the basis of the future force. There is no precise model to optimise our force structure, therefore in 2025 our forces will need to be multi-mission, mobile, flexible, adaptable and capable of precise and discriminate use of force. This requirement dictates a high premium be placed on the training and maturity of our young men and women who wear Australia's military uniforms.



NOTES