MARITIME OPERATING CONCEPT
MarOpC

THE MARITIME FORCE CONTRIBUTION TO THE INTEGRATED OPERATING CONCEPT

ROYAL NAVY

Contents

The Maritime Force

The MarOpC describes the totality of the Maritime Domain contribution to the Integrated Force. Whilst dominated by the Royal Navy, the contribution to, and dependencies with, the Maritime Domain are not limited to the Royal Navy. The MarOpC considers the Maritime Domain agnostic of TLB, but then draws specific deductions and insights for the Royal Navy.

Using the MarOpC

The MarOpC is a concept; not policy, strategy or doctrine. It supports the implementation of policy and the practice of strategy by establishing the operating methodology for the Maritime Force and provides a sound intellectual underpinning. It is complementary to, and complemented by, the RN Strategy. The delivery of the MarOpC is supported by a series of functional and thematic sub-concepts, which will further articulate the method and means by which the ambition of the MarOpC is to be realised.

Audience

The MarOpC (O) distils the MarOpC into a releasable version, primarily for international partners, allies, industry and academic partners. The MarOpC provides a single articulation of how the Maritime domain contributes to the Integrated Force and to delivering integrated action. This should be orientated around the Multi Domain Integration decision action cycle, where Defence's ability to 'sense', 'understand', and 'orchestrate' effects occurs at the optimum tempo as a result of synchronising activity across domains to amplify effect.

Executive Summary

Insights/Key Judgements

- The Maritime Operating Concept (MarOpC) is an effects-based concept which addresses the demand set by ISDR 21 and IOpC.

- The MarOpC is a methodology for operating and is adaptive; adjustments will be necessary as the operational context changes.

- Global Competition, Climate Change, Technology Proliferation, Changing Demographics and Affordability will likely be the defining features of the Future Security Environment.

- The utility of the Maritime Force is best understood as Contingency in Use.

Vision

"A people centric organisation that embraces innovation and technology working as one team to be an operationally effective, global Navy, at the heart of our national endeavour: protecting the United Kingdom, preventing conflict and ready to fight our enemies whenever and wherever needed."[1]

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[1] RN Strategy.

Purpose

The MarOpC is an audience-centric concept which describes the Maritime Force response to the demand set by ISDR 21 and IOpC. Alongside the RN Strategy, it describes the Wise Pivot of the Maritime Force, from a platform-based, role-specific, and aggregated Fleet, to a distributed protean force, operating as a system of systems. Using the Royal Navy's Force Level Outputs, this concept describes how the Maritime Force will deliver National operational advantage and integrated action, and the change required to accomplish this.

The MarOpC delivers a clear vision of the Maritime contribution to the military instrument of national power and defines how the RN will be developed. Informing the Capability Management Strategy, the MarOpC provides the basis for a long-term funding and capability strategy, informing the RN proposition at future Defence Reviews. The MarOpC should be read alongside the RN Strategy.

Today's policy makes demands of the RN which can be best met by adopting the MarOpC now, and ahead of an anticipated Integrated/Defence Review in 2025. But it will take time for change to occur, and the alignment of organisational change, cultural re-boot and capability transformation is expected to occur from approximately 2030 onwards. Whilst maturity may come at a point in the 2030s, we must adopt the operating methodology of the MarOpC now, recognising the importance of periodic review.

Realism

Meeting the present and future challenges is an exacting task. As a methodology for operating, MarOpC must be ambitious and adaptive; adjustments will be necessary as the operational context changes. Similarly, whilst unapologetically positive about the scale and pace of change, the MarOpC is grounded. Difficulties, tensions and contradictions are highlighted. Meeting the demand set by IOpC will impose tough choices, requires clarity of purpose and unity of effort.

Risk to realising the MarOpC

The MarOpC describes a system of systems approach, with increased geographic distribution, increasingly widespread use of uncrewed systems, and a wise pivot philosophy which forces early choice[2], all produce a resource demand. The Wise Pivot philosophy describes how competing value propositions might be evaluated; this is a behaviour as much as a process, and choices cannot be seen as deterministic, especially when the situation changes. The MarOpC is not about predicting the future, but it is about "*… not be(ing) so far off the mark that it becomes impossible to adjust once that character [of the future] is revealed* "[3].

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[2] i.e. At technology readiness levels (TRLs) not previous entertained.

[3] Professor Sir Michael Howard, quoted in DCDC, Future Character of Conflict, archived Dec 2015.

Defining features of the future security environment

Competition

Global competition – between states, for resources, access and influence – will continue to escalate and diversify. The range and breadth of effects required of Defence and the Maritime Force will continue to increase. Non-state security challenges (e.g. VEOs and Organised Crime) will place demands on maritime forces and require information exchange between a wide variety of stakeholders.

Climate Change

The impact of climate change will have substantial implications for global security, with the Intergovernmental Panel on Climate Change reporting that *"…changes in the climate system [will] become larger in direct relation to increasing global warming. They include increases in the frequency and intensity of hot extremes, marine heatwaves, and heavy precipitation, agricultural and ecological droughts in some regions, and proportion of intense tropical cyclones, as well as reductions in Arctic sea ice, snow cover and permafrost"*[4]. The effect of these changes will exacerbate resource competition, adversely affect bio-security and will spawn unforeseen health challenges. These factors will contribute to a less stable world. Alongside the security implications of climate change, the Maritime Force must evolve to meet the UK's Carbon Net Zero future. This is a substantial challenge which will influence the design and attributes of all future systems and capabilities for the Maritime Force.

Technology proliferation

Technology proliferation is a threat and an opportunity; in both cases it is a defining theme for the Maritime Force. Accelerating availability of high technology weapons, sensors and operational orchestration techniques[5] makes an attack on the UK and/or the Integrated Force more feasible for a broader range of threat actors. Comprehensive technological superiority can no longer be assumed, and in combination with a loss of operational advantage, would present a clear risk to strategic stability. Equally, there is opportunity, both through the increased attack vectors available to us when our adversaries become more reliant on technology, and through the potential for cost sharing and economies of scale for mass proliferation technology[6].

capabilities, dynamic and limited opportunities and a need for asymmetry and non-conformity in design, thinking and execution[7].

Demographic shifts

The global population continues to grow and is expected to reach 9.7Bn by 2050 and 11Bn by the end of the century[8]. This growth is expected to occur predominately in Africa and Asia and will be accompanied by continued urbanisation. This uneven distribution of population growth will produce security challenges; competition for resources (accentuated by climate change), declining working age populations in the Global North, and growing youth populations in the Global South are likely to increase pressure on public finances. The uneven distribution of wealth and opportunities will contribute to increased transnational migration. Changing demographics have the potential to disrupt extant social models and challenge resource and wealth distribution, all of which could manifest as security challenges.

Affordability

Fundamentally, affordability is a challenge. Traditional models of mass and equal standards of capability across the Force are no longer suitable or affordable. Instead, the Maritime Force must be targeted, focusing on achieving Operational Advantage, for clear purpose, against most likely adversaries. This prioritisation will present difficult choices; the Maritime Force must become comfortable with an uneven distribution of

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[4] IPCC_AR6_WGI_SPM

[5] This should be taken to be a very broad definition, with e.g. targeted misinformation delivered through a sophisticated medium considered just as much a weapon as one with a kinetic payload.

[6] Either commercial technology with dual use potential, or military technology with a wider user community (e.g. across NATO).

[7] Workforce costs must feature in the affordability calculus.

[8] Shifting Demographics | United Nations
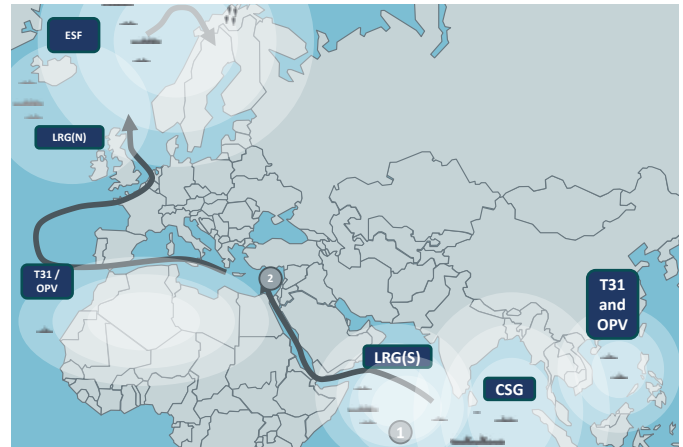
Contribution to the Integrated Force

The enduring attributes of Maritime Power continue to apply to the Maritime Force's contribution to the Integrated Force[9]. These attributes enable the Maritime Force to span the spectrum of competition and conflict, providing strategic choice, operational flexibility and tactical unpredictability.

The utility of the Maritime Force is best understood as Contingency in Use. The Maritime Force is configured for global engagement, crisis response and warfighting. This – combined with the access and persistence afforded in the maritime domain – permits the Maritime Force to contest operational advantage with our adversaries continuously. This advantage will be exploited – directly or indirectly – across all domains, with Multi-Domain Integration providing the framework and gearing to synergise effect.

Global access for the Integrated Force – especially for crisis response and warfighting – is not assured. The Maritime Force is designed to compete and fight for and gain access, both into operational areas and across the littoral flank. This is more than just a battle for theatre entry; it is the effect achieved through Persistent Engagement[10], which allow us to position forces early, offsetting the need to fight for access.

MarOpC themes[11]

The following three themes define the MarOpC and provide the criteria against which to judge future choices.

Theme 1 – Becoming a Distributed Protean Force[12]

The Maritime Force will become more Distributed and Protean by design.

Distribution serves two distinct purposes. First, a more routinely distributed force enables increased persistence, and greater and more lasting effect. This ensures the Maritime Force is routinely orientated to deliver effects below the threshold of conflict, and when the full array of Maritime Task Group capabilities is not required. Secondly, distribution enhances lethality and survivability. Taken in concert with a system of systems approach, the Maritime Force will more routinely exploit cooperative sensor-decider-effector systems to increase the range (and frontage) at which adversary threats can be held at risk or targeted[13]. Distribution is used to maximise effect, to extend lethality and increase survivability. Distribution enhances the range, reach and effect of the Maritime Force.

A Protean Maritime Force is one which is fundamentally balanced and possessed of an innate adaptability. Taken further, the Protean Maritime Force is a move away from highly specific platform optimisation towards a force with interdependent and interchangeable system components[14]. It is a force comprised of multiple scalable and flexible systems, organised and orientated for effect not activity. Being Protean by design best positions the Maritime Force to capitalise on disruption – technological, environmental or situational. It increases choice and the utility of the Maritime Force.

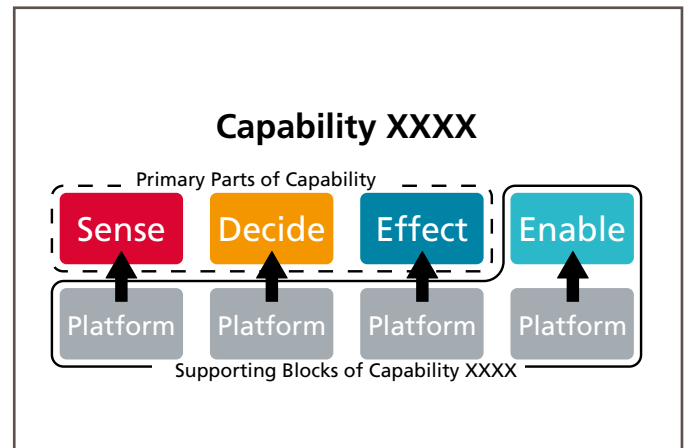[9] Access, poise, versatility, persistence and mobility.

[10] Especially in assuring continued freedom of access to the Global Commons and exercising Freedom of Navigation rights within EEZs and TTW.

[11] The Distributed Protean Force and Wise Pivot are further explained in Section 1, and System of Systems in Section 3. In the interests of brevity, these explanations have not been included in the Executive Summary.

Theme 2 – Executing the Wise Pivot[15]

The Maritime Force's Wise Pivot will empower the RN to navigate the disruption of transition to a Distributed Protean Force in a System of Systems approach, by identifying those activities, functions and capabilities which are reaching the end of their value return (the old), those that are mid-value return (mid-life cycle – the now), and new investments to realise emerging value return (the new). This approach seeks to pivot the Maritime Force around these three foci, releasing trapped value where possible through varied investment, while disinvesting in obsolete capabilities to increase freedom for investment in the now and the new. Executing the Wise Pivot is about choices, balancing today against tomorrow, taking quantified risk early, and avoiding the tyranny of the sunk costs' fallacy. In practice, a Wise Pivot for the Maritime Force will not be a moment, but a philosophy of decision-making, with choices conditioned by the relative weighting of the three foci (old, now, new). Such choices have been simplified to sunset/sunrise; in practice it is a more sophisticated and nuanced set of decisions to be made.

Theme 3 – Adopting a System of Systems approach.

Adopting a System of Systems approach serves two functions. First, it breaks the link between platforms and effects. In a System of Systems model, functional system components are integrated into an interdependent system, producing effect greater than the sum of the parts. For the Maritime Force – either alone or as part of an Integrated Force – this approach: increases lethality through proliferation of sensors and effectors; increases availability and resilience by removing single points of vulnerability; and increases availability, resilience and persistence by increasing available choice and enables the Maritime Force to better retain balance. Secondly, by breaking the link – and by implication the traditional model – between platforms and capabilities, a System of Systems approach increases the scope for capability and technology insertion, increasing agility and ultimately contributing to operational advantage. Achieving this is a behavioural challenge. If done half-heartedly or haphazardly, then considerable additional effort is needed later to enable the systems and capabilities to fit into the System of Systems approach.

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[12] Protean, derived from Proteus – Homer's 'Old Man of the Sea': Capable of constantly changing shape or form (OED). The more familiar term 'hybrid' fails to adequately describe the adaptability, flexibility and choice inherent in the Maritime Force.

[13] Such distribution is not anathema to Task Group operations; the incremental aggregation of Littoral Response Groups into Littoral Strike Groups, and in conjunction with Carrier Strike Groups to form an Expeditionary Strike Force illustrates this.

[14] E.g. Navy PODS.

[15] A Wise Pivot for the Maritime Force is entirely distinct from the 'tilt to the Indo-Pacific' described in Defence in a competitive age (publishing. service.gov.uk) (and previously referred to as a 'pivot' in previous commentary).

Delivering IOpC

The IOpC framework of Protect-Engage-Constrain-Warfight helps organise activity and effect, by purpose. It does not imply either a linear progression through the framework, nor that each is a discrete component. For the Maritime Force:

- A continued focus on complete capabilities, able to cover the full range of effects through Protect, Engage, Constrain and Warfight, often simultaneously. This is **Contingency in Use.**

- Retaining balance, sufficiently committed to Protect-Engage, without relinquishing the option to Constrain and Warfight. This will be as much about operational design as it will be about the force package.

Protect:

A resilient force capable of superiority both above and below the water, delivering a cross-Government integrated response, safeguarding the Homeland and Overseas Territories, our people, our economy and our way of life.

Engage:

A force capable of deploying and sustaining Task Groups, Task Units and personnel around the globe, at sea and ashore, integrated with agencies and partners. This mosaic of persistent engagement offers strategic agility and political choice to project the UK's global influence.

Constrain:

A force capable of influencing a competitor's decision calculus by conventional and asymmetric methods, as part of a fused approach and delivered through Integrated Action. This will require forces capable of undermining an adversary's assumptions and attaining local escalation dominance.

Warfight:

A powerful force that uses technology and innovative operating methods to fight and win.

The Maritime Force is organised to deliver four Force Level Outputs. These outputs used singularly or in concert provide the ways and means to deliver to IOpC:

- Homeland and Operational Advantage in the North Atlantic (OANA): An integrated Maritime Force, at the heart of NATO; protecting our homeland and our allies.

- Persistent Engagement: A high utility force optimised to deliver persistent global presence.

- Carrier Strike: The heart of the Maritime Force's – and NATO's – warfighting capability, built around the Queen Elizabeth Class Aircraft Carriers.

- Littoral Strike: A persistently engaged and technologically enabled Commando Force capable of strike and Special Operations.

Section 1 – Introduction

Insights/Key Judgements

- The ISDR 2021 and DCP 21 sets the UK's strategic vision and evaluates the global trends likely to impact upon our ability to realise the vision. These trends are directly relevant to Defence and the Maritime Force.

- Drawing on RN Transformation's existing intent and progress, the MarOpC 'mainstreams' Transformation into the 'operating system'.

- The Royal Navy is evolving to become a future Maritime Force which is more distributed, protean by design, more interchangeable and interdependent, and functioning as a co-operative system of systems.

Strategic Context

Global threats continue to intensify and diversify at a rate of change and level of uncertainty that may outpace good governance and degrade the Rules Based International System. The UK faces fierce competition, risk of state conflict, rapid and major technological change and a shifting global economy. Complexity, instability, uncertainty, rapid change and pervasive information will determine the future operating environment.

ISDR 21 reaffirms UK political ambition. Prosperity – underpinned by security – through the maintenance of trading routes and access to the global commons is a vital enabler of a Global Britain[16]. Britain as a Maritime power enables this ambition and is underpinned by a Royal Navy which is adept at dealing with the totality of these challenges concurrently. To enable this global ambition the Royal Navy provides political choice: to employ force[17]; to be a maritime leader in NATO and to remain the lead European Navy; and to be capable of protecting the nation's interests at home and abroad.

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[16] Including CNI and undersea cables.

[17] To do so without need of recourse to allies if appropriate or necessary.

ISDR 2021 and DCP 21

- Defined the Government's ambition for **the UK's role in the world.**

- Outlined long-term strategic aims for **national security and foreign policy.**

- Set out the way in which the UK will be a **problem-solving** and **burden-sharing nation.**

Informed by the IOpC, ISDR 2021 sets the UK's strategic vision and evaluates the global trends likely to impact upon our ability to realise the vision. DCP 21 sets out what this means for Defence. These trends are directly relevant to Defence and the Maritime Force, and continue to shape a future which is volatile, uncertain, complex and ambiguous[18]. Traditional distinctions of war and peace, home and abroad, and state and non-state are no longer binary. Our adversaries have diversified their approach, exploited seams, boundaries, technology and information, all with the aim of undermining our security and prosperity. DCP 21 sets out Defence's contribution to the four overarching objectives of ISDR 21, each of which directly influence the Maritime Force:

- **Sustaining strategic advantage through science and technology.** Defence will support through: contribution to UK cyber power through the National Cyber Force; investment of at least £6.6bn in Research and Development (R&D) over the next four years, guided by the Defence Science and Technology Strategy 2020; a network of innovation hubs and Defence and Security Accelerator challenges; supported by the Defence and Security Industrial Strategy in creating a more certain environment for industry. For the Maritime Force, RN technology accelerators and centres of innovation will complement the Defence approach, but with much more clearly defined benefits to the future Maritime Force.

[18] Global_Strategic_Trends_-_The_Future_Starts_Today.pdf

- **Shaping the open international order of the future.** Defence will contribute through: continued adherence to International Law; the conduct of freedom of navigation operations in support of international maritime law; modelling responsible behaviour in cyberspace and space[19]; ethical development and deployment of technology based on democratic values; and by embedding international laws, rules and norms in partners' approach to security through capacity building.

- **Strengthening security and defence at home and overseas.** Delivered through: defence of the UK, the Overseas Territories and Crown Dependencies, the ability to conduct non-combatant evacuation operations when needed, and with CBRN expertise; the centrality of alliances in achieving our contribution to deterrence through collective security, especially with our allies in NATO, JEF, CJEF, AUKUS and FPDA and by building the capacity and resilience of like-minded partners to evolving security threats; support for UN peacekeeping operations as part of the Government's effort to reduce the frequency and incidence of conflict; and by providing high-end PURSUE counter-terrorism capabilities, maintaining ongoing contribution to Global Coalitions, as well as further integrating our counter-terrorism activity through the new Counter Terrorism Operations Centre (CTOC).

- **Building resilience at home and overseas,** especially through: Military Aid to the Civilian Authorities, particularly for novel situations or unforeseen events or the realisation of strategic risks; support to local authorities in responding to extreme weather events, and to law enforcement following terror attacks; our readiness to provide humanitarian relief overseas at speed; and our ability to provide specialist and rapid support in responding to global health risks.

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[19] Where normative behaviours will establish precedence for future codification (e.g. in International Treaty Law). This observation does not infer that there is an absolute absence of law in the cyber or space domains, rather that (like all law) it continues to develop as use changes and evolves. For the two 'non-traditional' domains, the existing laws and regulations are less mature than in other domains.

A wise pivot – from platform-centric to distributed protean.

The contemporary Royal Navy is a force designed around platforms – ships, submarines and aircraft – which have distinct and sometimes singular purposes. This current highly capable platform centric approach is becoming increasingly unaffordable. Taken in combination, a Maritime Task Group may be potent across all sub-domains, but it was not designed with interdependency, modularity, distribution or to be protean[20] in mind from the outset. The Royal Navy is evolving to become a future Maritime Force which is more distributed, protean by design, more interchangeable and interdependent, and functioning as a co-operative systems of systems[21]. This is driven in part by the expanded remit of tasks across far greater geography and in part by the accelerating complexity of threat. Pivot foci:

- **Old – the Force we have.**
  Focused on Sustainability. We will do better with the current Maritime Force, seeking marginal gains, exploiting opportunities and protecting vulnerabilities. We will avoid falling victim to the sunk costs fallacy and will actively reject diminishing returns.

- **Now – the Force we are becoming.**
  Focused on Availability. In realising ISDR 21 investment we will shift focus from platforms to capabilities, and into a System of Systems approach. We will prioritise effect over Force Elements and will actively horizon scan to identify future changes which will signify the pivot to New. This will be the Force which embodies a High/Low mix.

- **New – the Force we will need to become.**
  Focused on Lethality. We will have diverged from linear and additive processes where choice was conditioned at programme inception. We will be a protean force, combining core capabilities of enduring strategic utility with much shorter lifecycle capabilities which enable us to incorporate disruptive technology at the optimum moment, at higher refresh rates, and do so more frequently across a diffuse range of capabilities and technologies, and with greater agility.

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[20] In this context, to mean the ability to offer (some) effect across multiple domains and environments.

[21] The introduction of the Persistent Operational Deployment Systems (PODS) initiative, and modular systems/system compatibility exemplifies the Maritime Force system of systems approach, and neatly underlines a method by which the Force can become protean.

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Distributed and Protean – what does this mean?

Being distributed increases breadth and depth of effect – both tactically and operationally – and a protean force is one that possesses innate adaptability; we are moving away from highly specific platform optimisation towards a force with interdependent and interchangeable system components.

It is a force comprised of multiple scalable and flexible systems, organised and orientated for effect, and not activity. Being protean by design best positions the maritime force to capitalise on disruption and to generate the necessary asymmetry.

The Maritime Force will be Distributed so that the Maritime Force can:

- Routinely be more present and more persistent, delivering a greater range and depth of effects when operating below the threshold of conflict; and

- Best exploit the lethality and survivability opportunities in a system of systems model

This distribution is not solely a tactical concept; it extends operationally and strategically.

The Maritime Force will be Protean by design – simply, it will be a force which is designed to shift in form and focus depending on the demands of the circumstances. This will mean – for example – an interchangeability of systems and sub-systems to an extent not routinely present today. This is not an equipment-only approach; it will also encompass the philosophical and intellectual foundations of the force, as well as training, infrastructure and logistics, producing a Maritime Force designed to move seamlessly and swiftly across the Protect-Engage-Constrain-Warfight framework.

Explaining the Wise Pivot; a philosophy not a moment in time

Originally coined in "Pivot to the Future: Discovering Value and Creating Growth in a Disrupted World" by Omar Abbosh, Paul Nunes, Larry Downes, the Wise Pivot is a way of thinking, not a single act. Consistent rapid evolution of the Maritime Force will demand a continuous sequence of Wise Pivots to gain and retain operational advantage.

Executing the wise pivot is a continuum and is about choices. Balancing today against tomorrow, taking quantified risk early and avoiding the fallacy of sunk costs. In practice it is a sophisticated and nuanced set of decisions, which allow quantified and tolerable risk early to create headroom for future investment. We will shift away from peaks and troughs of Maritime Force capability as moments in time, and instead seek continual and incremental improvement.
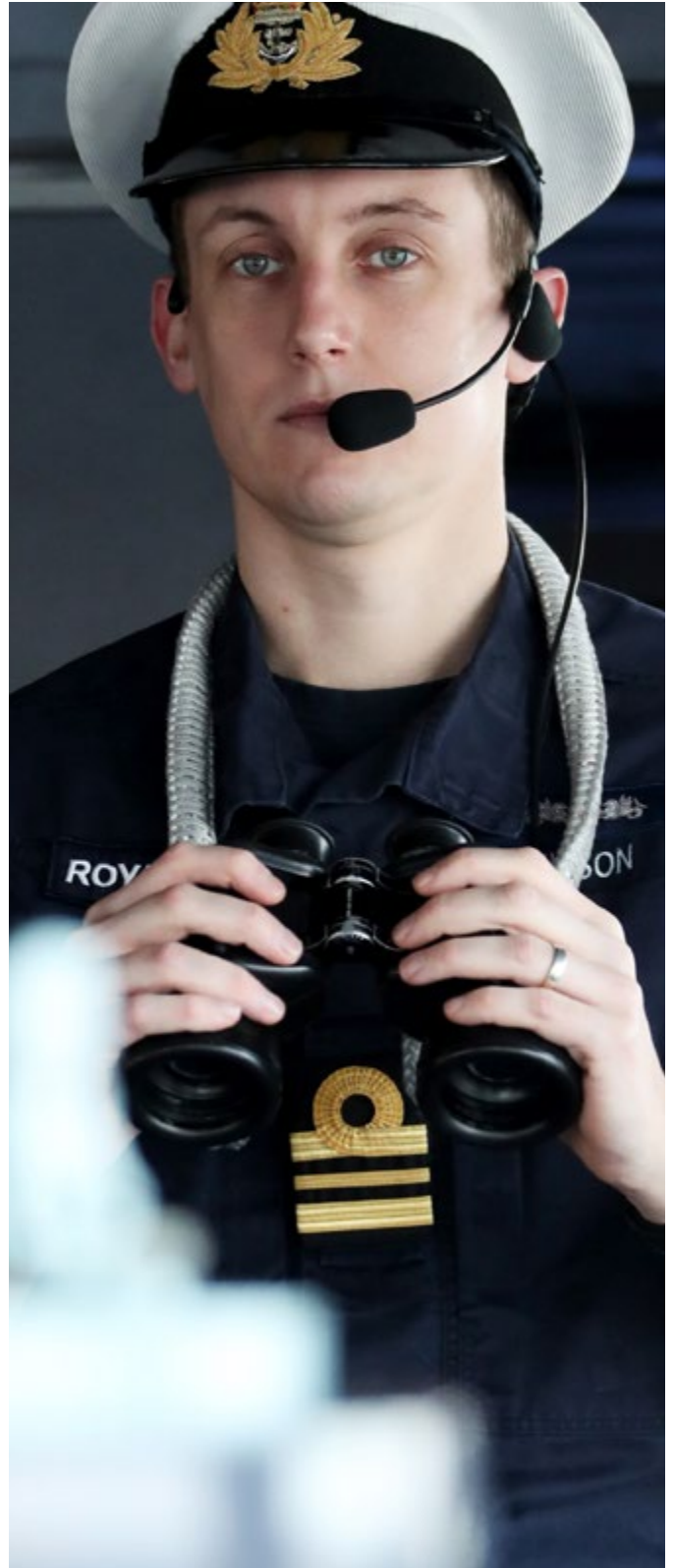
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Section 2 – The Case for Change

Insights/Key Judgements

- The threats have changed, evolving in a manner and at a pace which tests our confidence in holding operational advantage.

- The UK and the Rules Based International Order (RBIO) face revisionist challenge, both at home and abroad.

- Government and Defence policy now demands increased and more varied contributions to National Security from the Royal Navy, most substantially in constant sub-threshold competition and persistent global effect.

The case for change is simple. First, the threats have changed, diversifying, deepening and evolving in a manner and at a pace which tests our confidence in holding operational advantage. Secondly, Government and Defence policy now demands increased and more varied contributions to National Security from the Royal Navy, most substantially in constant sub-threshold competition and persistent global effect. More of the same will not be sufficient. Alongside this, and stimulated by common drivers, our partners and allies are also changing. To remain valued, relevant and a net-contributor to security, we must change too.

Changed (and changing) Threats

Adversary Assumptions

- Our adversaries anticipate a presence advantage. Their vulnerabilities are close to home and they will enjoy interior lines to some degree.

- They are confident they control escalation.

- They are not constrained by a need to uphold and adhere to the rules-based international order[22].

- They deliberately erode the distinction between peace and war and exploit the dilemma this presents to liberal democracies.

- There is an asymmetry of risk appetite. Ours is lower than theirs.

Counter-State Based Threat

The UK and the Rules Based International Order (RBIO) face revisionist challenge, both at home and abroad.

In Europe and the North Atlantic a resurgent Russia persists with malign activity to undermine, discredit and weaken security, especially amongst NATO member states. Russia's continued development of advanced underwater capabilities poses a threat to critical national infrastructure (particularly undersea cables) and to the operational advantage needed to assure the Deterrent.

In the Indo-Pacific, China's rise challenges established freedoms, norms and the security of global economics and many of the UK's long-standing allies. Beyond the Indo-Pacific, China compete for access, influence and economic partnership, and at penalty to the security and prosperity derived from the RBIO. China's maritime growth is expected to continue apace through the next decade, increasing the capacity and probability of expanded Chinese operational activity in the Pacific and further afield.

North Korea and Iran both continue to destabilise their own regions, and their pursuit of nuclear weapons programmes further threatens global security. Critically, both directly threaten UK partners, interests and elements of global economic stability.

Violent Extremist Organisations and terrorist groups continue to threaten the UK and UK interests, both at home and abroad. They also pose a threat to security at a regional level, accompanied by the risk of wider conflagration as the result of instability and state collapse.

Cyber and Space are projected to become both more contested and more critical, both to National security and operational advantage. Nationally, the spread of technology into the social, governmental and economic fabric exposes vulnerabilities which adversaries may target. For Defence and the Maritime Force, Cyber and Space continue to grow in importance as critical requirements. Although initially this critical reliance may present as risk or exposure, the development of capabilities and techniques which exploit opportunities in Cyber and Space also offer a route to advantage where traditional, linear techniques of mass are no longer suitable.

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[22] And would contend that it is simply a Western rule-set to suit Western purposes.

Increased and more varied contributions to National Security

ISDR 21 and DCP 21 expand Defence's potential contribution to National Security, both by remit and implication. The intent and ability to leverage whole of government effect necessarily removes boundaries between functions and departments. This blurring of boundaries: requires increased understanding and coordination of effect; offers a greater variety of options for delivering effect (including complementary effect in support of wider objectives); increases Defence's contribution to National Security (albeit not in isolation). This contribution now covers:

- Counter-State Threats

- Non-state threats e.g. VEOs and Terrorism

- Sub-Threshold Competition

- Persistent Global Effect

- Prosperity and Trade

Strategic challenges facing the Maritime Force

The Maritime Force faces 10 strategic challenges which must be overcome to successfully pivot to face the future security environment. Some are not new, some are not uniquely a product of the changing security landscape, but taken together they frame the change needed:

- Return to state actors driving national security threats.

- Increased focus on Indo-Pacific region.

- Proliferation of technology and the ability to maintain operational advantage.

- Ageing platforms placing pressure on availability.

- Lack of agility and pace in the acquisition process.

- Increasing competition for maritime resources.

- Lack of persistent presence in key regions, even when in concert with our allies.

- Affordability of future capabilities.

- Recruiting and retaining our key people in a more competitive global market.

- The profound impact of climate change and the opening of new sea routes.

Section 3 – Philosophy

Insights/Key Judgements

- The ISDR 21 and DCP 21 investment in the Maritime Force is substantial and heralds a new era of British maritime power.

- Affordability will continue to shape our future, especially as the cost of high-technology military systems continues to accelerate. This will not be a resource defined force – the case for capabilities precedes budgetary allocation – but will continue to be a resource-informed force.

- The Maritime Force will move away from a platform focus, and instead consider functions in the context of a system of systems, where single platforms are no longer the capability focus, and instead the ability to deliver effect as a system drives capability.

- The shift from a platform-centric Royal Navy into a protean, distributed Maritime Force, integrated by design and for advantage is the Royal Navy's Wise Pivot.

- The Royal Navy is evolving to a future of greater distribution, more protean, interchangeable, interdependent and cooperative systems of systems. In part due to the expanded remit of tasks across far greater geography and in part driven by the accelerating complexity of threat.

- The MarOpC is an operating concept designed to fulfil the UK's National Strategic Design. In essence, Deterrence by Denial.

- The Maritime Force cannot rely on mass alone to prevail (either above or below the threshold) instead, our theory of operational art is one of relative superiority.

The MarOpC provides the cohering ways (both strategic and operational) to connect the RN to the IOpC frameworks and revised Defence Strategy and policy, specifically setting how the IOpC will be realised in the Maritime domain. The MarOpC sets out:
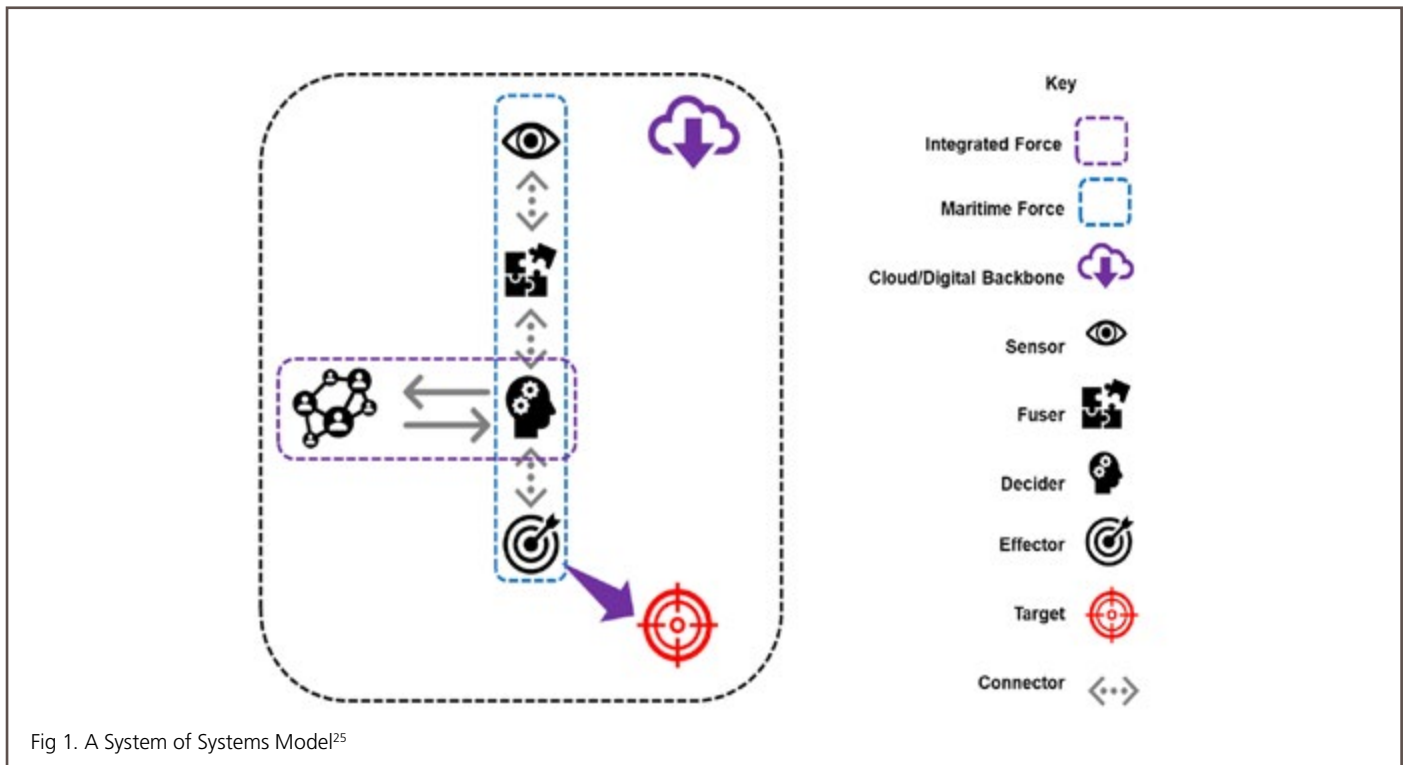
The Maritime Force contribution to delivering National operational advantage and integrated action, and the change underway to achieve this.

The Investment

The ISDR 21 and DCP 21 investment in the Maritime Force is substantial and heralds a new era of British maritime power. An additional investment of £9bn includes a comprehensive programme of shipbuilding throughout the 2020s, investment in a Special Operations capable Commando Force, and a lethality update. This investment signifies both the expectation and demand signal placed upon the Maritime Force.

Along with investment, there will be focused disinvestment in legacy capabilities which no longer contribute meaningfully to the Maritime Force. This disinvestment will not be a smooth path; it will create gaps, bulges and short-term challenges. However, it is necessary. Disinvestment releases resource (of every kind), without which a move away from a platform centric 20th century navy and towards a distributed protean Maritime Force – the wise pivot - would not be possible.

Affordability will continue to shape our future, especially as the cost of high-technology military systems continues to accelerate. This will not be a resource defined force – the case for capabilities precedes budgetary allocation – but will continue to be a resource-informed force. We will not win every capability argument and investment profiles may differ from ambition, but by focusing on effect and the coherence of the Force Level Outputs we can derive best return from Defence's Programme of Record and the Annual Budgetary Cycle.

Fig 1. A System of Systems Model[25]

The Maritime Force as a System of Systems

At present, the Royal Navy is a collection of platforms, each optimised for a particular primary role. There is little interconnectedness or interdependence for primary functions. This has attractions, not least simplicity and resilience (at the platform level). It is also linear, slow to evolve, relatively unconnected, expensive, and there is duplication. The Maritime Force will move away from this platform focus, and instead consider functions in the context of a system of systems, where single platforms are no longer the capability focus, and instead the ability to deliver effect as a system drives capability[23].

Fig 1 (above) introduces a common taxonomy for system components, for both the Maritime and Integrated Force[24]. The taxonomy is deliberately platform/ function agnostic; this will help drive systems thinking into Maritime Force capability design and contribute to a wider effort to break stovepipes.

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[23] This does not automatically mean an ambition of complete interchangeability, and areas of optimisation will endure for some platform types. Equally there are other areas where a combination of system will be essential to enhancing utility.

[24] This taxonomy is compatible with both the Air Operating Concept (AOpC) and the Army Force Centric Capability Management Model (FCCM).

[25] This representation of the Maritime System of Systems uses a symbology common with the AOpC.

A Wise Pivot – from platform-centric to distributed protean

The shift from a platform-centric Navy into a protean, distributed Maritime Force, integrated by design and for advantage is a Wise Pivot. The withdrawal of legacy platforms will be meshed with the introduction of protean systems with greater versatility and structural resilience, but with concomitant reliance on the wider components of the system. At inception, the first component of the system will join a fleet of legacy platforms and without the wider elements of the system which enable maximum effectiveness. This temporary limitation is necessary to pivot but will require forensic management to assure operational output. The essence of the Wise Pivot is in minimising the limitation, without stymieing change – moving at the right time. Acute periods of reduced effectiveness in some elements of the Maritime Force should be accepted. This will prevent a confluence of compound vulnerabilities later. Throughout, we must design and deliver future systems configured for a distributed protean force, rather than narrow, stove-piped or stop-gap solutions.
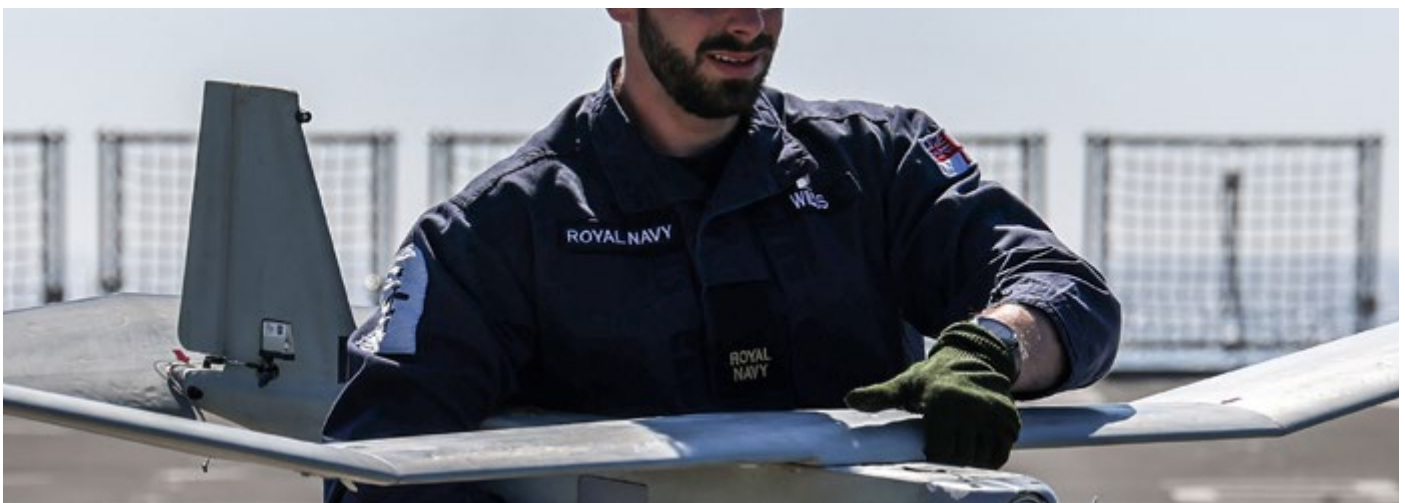
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[26] A subset of Deterrence Theory. See Defence Strategy 21 (draft), JDN x/22 Deterrence: The Defence Contribution (SD1), and Snyder, Glenn. Deterrence by Denial and Punishment. Princeton: PUP, 1959 amongst others.

[27] Deterrence by Punishment. Simply, presenting an adversary with unacceptably high costs of transgression.

Strategic Theory – Deterrence by Denial.

The MarOpC is an operating concept designed to fulfil the UK's National Strategic Design. In essence, this is one biased towards Deterrence by Denial[26]. Deterrence by Denial preferences the ability to disrupt an adversary and increase the cost of their actions, over the ability to inflict punitive damage or strategic reversal (known as Deterrence by Punishment)[27]. Drawing too clear a distinction is unhelpful; it is not 'either/or', and it will always be important to strike a balance between the two. Instead, a spectrum exists, with – in this case – effort weighted towards Deterrence by Denial, and so to the Protect, Engage, and Constrain functions of IOpC.

Effective Deterrence by Denial is critically dependent on a suitably assertive approach. The adversary must perceive a risk of being 'squeezed' everywhere. Whilst the policy and orders of the day will always take precedence, it is the purview of this MarOpC to set the right mindset. We must train to be, expect to be, and act as if we wish to be, atop and ahead of the adversary in everything they do; not just afloat but in our attitude everywhere.

Deterrence expanded

Deterrence Theory is a subset of Coercion, of which there are two branches – compellence and deterrence. Aim of both (in combination) is to:

- Mould an actor's perceptions

- Influence an actor's decision making

- Control an actor's behaviour without recourse to enforcement by violence

- Deterrence: Focus on prevention and maintaining the status quo[28]

- Compellence: Persuade an actor to change, either adopt a new behaviour or cease a current one

The credibility of the coercing party and the understanding of the challenger are key. Coercive threats (e.g. Deterrence) are most effective when paired with assurance and inducements. Context and understanding are essential; rational actors are the most suitable entities for examining coercion[29].

Deterrence

Aims to dissuade an opponent from acting, by convincing the challenger that the costs outweigh the benefits. Deterrence is fundamentally a psychological exercise which aims to influence and control decision making. There are two strands:

- Deterrence by Punishment: the threat of unacceptable punishment. e.g. but not limited to, nuclear weapons[30]. The UK strategic culture is relatively familiar with Deterrence by Punishment, however a recourse to Punishment (where Punishment can only be imposed with nuclear weapons) alone denudes the credibility of responses below the threshold of nuclear retaliation (especially if considered alongside the concept of a 'nuclear taboo') and cedes control of escalation to the adversary.

- Deterrence by Denial: preventing the challenger from executing their strategy. e.g. by being a difficult target or by continuously disrupting preparations or capabilities.

By competing constantly, and below the threshold of conflict, we will actively pursue a strategy of Deterrence by Denial, building depth ahead of, and setting appropriate conditions for Deterrence by Punishment. This approach imposes friction, opportunity cost, and the challenge of attribution ambiguity upon the adversary[31]. It requires constant application and is inherently fluid, dynamic and evolving; learning and repeating patterns of operational techniques will be inadequate. We must be constantly evaluating, a thinking and competing adversary, and designing evolved techniques to apply pressure, constrain malign activity and impose Deterrence by Denial.

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[28] E.g. In sustaining adherence to RBIO and contesting Chinese revision of TTW and EEZs in the South China Sea.

[29] Rational actors will not all share the same frame of reference or definitions of success. It is important to examine an actor's perspective (and assessed understanding) to be able to determine what might plausibly be considered rational from their perspective.

[30] It is important not to conflate CASD ('The Deterrent') as synonymous with the totality of UK deterrence. The UK's ability to impose Deterrence by Punishment is in part but not exclusively delivered through CASD; conventional capabilities also contribute to effective Deterrence by Punishment.

[31] Attribution ambiguity; an adversary's inability to usefully attribute an action to a particular actor. Especially important for activity below the threshold of conflict.

Relative superiority – an alternative theory of winning

This concept has thus far set out the difficulties, nay impossibilities, of keeping pace technologically in every aspect of maritime and Defence technology whilst simultaneously retaining mass in the force[32]. It would be easy to deride this as another 'more with less' moment. Not so. That we cannot simultaneously keep pace technologically in all areas and grow mass is an immutable truth. What matters more is how that reality can be shaped. The Maritime Force cannot rely on mass alone to prevail (either above or below the threshold) instead, our theory of winning is relative superiority[33]. Instead of being able to cover all bases simultaneously and consistently, we must expect to fight for sufficient advantage in information, such that we can bring to bear the right capabilities at the right moment whist also protecting our vulnerabilities.

This approach is resource efficient, but lives and dies on the quality of understanding, appropriate operational and tactical freedoms, persistent attention to operational design, and on the ability to respond to opportunities and threats. It is less programmatic and deterministic; instead it is dynamic and probabilistic.

To meet this ambition, the Maritime Force should lead a step change in security behaviours across the Integrated Force. The interconnections of today's operating environment introduce many more access points, weak spots and 'back doors' than ever before. Inadvertently revealing the intimate details of the Maritime Force to our adversaries is tantamount to surrendering operational advantage before we begin.

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[32] The application of technology can be used to increase mass, but this will need to be targeted and specific.

[33] McRaven, William, Case Studies in Special Operations Warfare

Relative Superiority

Wielding ubiquitous power has become prohibitively costly as to be practically impossible for the Maritime Force[34]; instead, superiority can only be relative.

Relative superiority is a seductively simple idea. It is the ability of a smaller or less powerful force to achieve an advantage over a larger, more powerful or better positioned adversary. It is achieved by creating an asymmetry between the two forces.

The following examples are provided for illustration, rather than as a prescription. There is little to directly extract, save for a better understanding of what relative superiority might look like. Relative Superiority – providing operational advantage – is constantly competed for; form and method change and evolve, and yesterday's battle winning idea is tomorrow's folly. For the Maritime Force, achieving relative superiority is unlikely to be a single domain endeavour, nor an isolated flash of brilliance. It will require the facets of Multi-Domain Integration, appropriately harnessed over time, to produce apertures of relative superiority.

Case Yellow – The 1940 invasion of France. Driven by strategic necessity[35], Case Yellow was the Wehrmacht penetration of the Allied lines through the Ardennes and at Sedan, and the subsequent encirclement of the Allied armies in Northern France and the Low Countries. To achieve this, the numerically inferior German forces concentrated their armoured mass and leveraged technological asymmetries[36] to achieve relative superiority. Famously, the French General Charles Delestraint lamented "We had three thousand tanks and so did the Germans. We used them in a thousand packets of three, the Germans in three packs of a thousand."[37]

Battle of the Atlantic – 1939-1945. The Allied sea lines of communication were threatened, disrupted and degraded by German U-boats. Throughout the duration of the Second World war operational and tactical approaches by both sides evolved. Hunting U-Boats (defending the whole Atlantic) was resource-hungry, of limited effectiveness, and wouldn't have directly related to the success criteria (sustaining SLoCs). Instead, the limited escort forces (especially until early 1943) were concentrated with convoys. This concentration, along with the application of right technology and tactics, ceded freedom of manoeuvre to U-Boats throughout the Atlantic except at the point it mattered. Here, where U-Boats attacked convoys, the Allies were able to achieve local, temporary relative superiority[38].

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[34] It is arguable that even at its zenith of numerical and technological superiority, the Royal Navy has never wielded ubiquitous superiority (in both time and space). The same is likely true of all maritime powers; superiority is gained by concentrating force (either in time or space).

[35] The nature of Nazi Germany's strategic necessity, the gestation of Case Yellow and the Ex Post Facto identification of a Blitzkrieg doctrine are fascinating subjects in their own right but are not explored further here.

[36] Employment of radio in tactical formations and effective air-land integration.

[37] See Blitzkrieg In The West: Then And Now, Jean-Paul Pallud, 64.

[38] Expressed as a general condition across the course of the campaign, rather than to suggest that in every convoy engagement escort forces triumphed for no loss.

Design principles for the Maritime Force

The Design Principles ensure we will be more lethal, more available and more sustainable. They set the conditions to accelerate to the future and ensure that we will implement IR21.

The Royal Navy will be more operationally effective by:

Focusing on offensive warfighting capability able to deter hostile states.

Why

The re-emergence of state-based threats to our security and the proliferation of technology demands a focus on lethality across our 4 force level outputs (OANA, CS, LS, PE) to deliver credible deterrence.

What

We will prioritise integrated offensive capabilities designed to respond in contingency and warfighting. We will sustain CASD as the nation's ultimate insurance policy. We will transform lethality away from an outmoded 'overmatch by mass' approach to a more holistic model which combines multiple methods of defeating an enemy (including cross-domain) and seeks to bring them to bear with precision and in combination; especially in multiple domains and where combinations increase effect[39]. Cognitive asymmetry is equally important as tactical skill; the capability to compete below the threshold of conflict is key. There is no single approach, and the Maritime Force will require a combination of lethal capabilities which hold adversaries at risk and range.

Being globally present and persistently engaged.

Why

The legacy approach of maintaining forces at readiness at home to be deployed at the times of crisis is no longer adequate to meet the threat. Being persistently engaged demonstrates commitment and resolve, and generates credibility and influence.

What

The Maritime Force will contribute to global competition across every level of activity and in each element of the IOpC framework. From forces persistently engaged around the globe to delivering the Deterrent. Maintaining good order at sea – upon which the global economy relies – is a less benign activity now than it has been for the preceding decades; we must compete continually to uphold the RBIO at sea. A Global Navy, we will be present and engaged in support of National Security Objectives. The Maritime Force will tailor its presence to meet demand and has no artificial geographic boundaries. Being globally present requires the deployment and sustainment of appropriate capabilities; limits of mass will necessitate choices. These will be driven by Defence Strategy.

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[39] Qualitative and quantitative – overmatch with numbers and technology.

Being at the heart of the Integrated Force and being interchangeable by design with our closest Allies.

Why

We cannot prosper alone; operational advantage will be achieved through cross-Government, multi-domain and international agility.

What

We will work in an Integrated Framework to provide choice to Government in support of the National interest. The Maritime Force will be a launchpad for National influence and engagement. Integrated by design, the Maritime Force will be able to amplify effects across domains, enable in other domains or to be enabled by other domains. Digital integration of the Maritime Force is the most obvious component, but culture, training and education also require refocusing to ensure we think and act in an integrated way. We will be interchangeable with our closest allies by design. Whilst neither exclusive nor exhaustive, this prioritisation will drive focus and determine weight of effort.

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[40] Societal expectation and government accounting practices for pension liabilities will continue to exert upward pressure on the unit cost of people. Our capability planning process must use uniformed personnel only where essential and draw on the wider whole force workforce wherever possible, while recognising that people have an inherent flexibility which cannot yet be achieved by other means and allows maritime platforms to contribute to the full range of Defence tasks.

[41] Greater uncrewing, combined with a distributed force, will continue to demand highly trained and technically skilled people to provide the necessary support which underpins availability and force support.

Prioritising autonomy and the synthetic environment in everything we do.

Why

Improved operational effectiveness, more realistic training, and mass, survivability & endurance in warfighting.

What

With all new systems integrated into a common digital architecture by default, we will enable our people to focus on operational front-line roles whilst autonomy will aid in increasing mass and resilience, and in removing the person from dull, dangerous and dirty tasks. We will exploit both the benefits of digital integration and increasing autonomy to increase the speed and accuracy of decision making in the battlespace. We will invest in optimally crewed, remotely crewed and uncrewed systems where appropriate. This is not a manifesto to remove the workforce. Rather it is a challenge to be much more discerning about where people are required in the future[40]. The future is blended, and we must exploit everything from simple robotics to machine learning and artificial intelligence, in pursuit of operational advantage. This is not a new idea, just a new manifestation. This means a Maritime Force in which crewed and uncrewed work in tandem – with uncrewing and autonomy giving resilience, mass, greater persistence, and enhanced survivability to the Maritime Force[41]. This approach releases people to focus on that which is uniquely human. We will accelerate the introduction of synthetic individual and collective training to better match our training to the scale, complexity and cognitive demand of the operating environment. Live training – especially at the collective level – will always have a place, but we must be realistic about its limits. The synthetic environment can better replicate those elements not achievable during live training, and offers data for analysis, instant repeatability and scope for mission rehearsal.

Adopting a modular approach to introducing new capabilities.

Why

The System of Systems approach in practice. Capability will be modular rather than platform-specific, and we will be more flexible, adaptable, upgradable and maintainable.

What

We will cease vesting capability in singleton platforms, where utility and function are fixed. Instead, we will distribute capability in interchangeable modules such as PODS (Persistent Operational Deployment System) thus removing single points of vulnerability and maximising agility. This increased distribution possible through modular systems enables rapid reconfiguration, increases operational effect and presents our adversaries with more dilemmas. The modular approach will be underpinned by the System of Systems approach, where individual capabilities are understood as system components within a 'plug and play' architecture. Tactical activity -such as ASW – will no longer be about attributing a platform (a single point of failure); instead it will be about arraying the appropriate system components, all enabled by a common digital architecture.

Investing in data exploitation systems that drive rapid and accurate decision making.

Why

To use data exploitation to increase operational effectiveness and increase efficiency. This will enable better decision-making across the RN and allow us to achieve more with our resources.

What

Data is already our lifeblood, but it is not well organised or exploited. Too much of our data sits in stovepipes, limiting its usefulness. The Maritime Force must be fully digitised in a common architecture to exploit and maintain the digital backbone which underpins Multi-Domain Integration. This is an exacting ambition which will have to be matched by effort and resource. Realising the MarOpC is dependent upon an absolute transformation of the Maritime Force's ability and capacity to process, exploit and disseminate data, including exchanging across the Force, across domains, across Government and with allies and partners. We must be able to achieve this at volume, speed, at different classifications, and across stakeholders.

Being a diverse and inclusive workforce.

Why

To be more global, more modern and more ready, we require a flexible workforce of sailors, marines and civil servants and industry partners that is appropriately skilled, more empowered and thus more operationally effective.

What

Today's workforce is not structurally ready for the future, nor does it contain the diversity necessary to thrive. We will change. Operational advantage is the prime driver, but there are others not least a moral imperative. Old paradigms will be broken to make the required change and established career structures will be revised. We consider People a capability, central to the delivery of effect. The introduction of autonomous and uncrewed systems offers an opportunity to focus on the uniquely human ability to resolve complexity and ambiguity, make decisions, and understand audiences. This approach allows us to increase lethality and mass; transfer the dirty, dull and dangerous, and to maximise the performance of our people.

Adopting a modernised support enterprise optimised to deliver availability.

Why

Our persistent global footprint, new platforms and evolving operating model require an enterprise and networked approach to support solutions.

What

Allied to the agility required in acquisition, the same must follow for our support organisation. This is a Whole Force model. Simultaneously, we must be clear where there are risks to our operational effect because of third party dependencies in the support solutions or where there are vulnerabilities our adversaries might exploit; we must harness global data. Support solutions will continue to be up front in capability acquisition, but we will now seek commercial where we can and military where we must. We will leverage interchangeability with key allies (especially when operating at range and reach from the UK or Strategic Hubs) and we will maximise economies of scale with export partners.

Incorporating environmental sustainability into our core business.

Why

The Government's Net Carbon Zero 2050 Strategy demands action now. Both in response to the strategic driver of climate change and as a socially responsible institution, we must act now and pivot towards a net zero future.

What

We will pioneer greener technologies across the Maritime Force – operationally and in the UK homebase – to reduce carbon emissions. We will leverage the convening power of the RN to access emerging technologies for energy efficiency and renewable power. In concert with a modular approach, we will update our capabilities incrementally, ensuring that we avoid carrying a legacy of high-carbon technologies beyond the point where viable alternatives exist. This will be exacting. The challenge not confined to propulsion technologies; it spans infrastructure, munitions and propellants, clothing and stationery, and electronic components. The carbon cost will be as defining as the financial cost. We will seek every opportunity for carbon offsetting and carbon capture, especially across the RN estate.

Adopting the appropriate acquisition model to match our capability requirements.

Why

We will choose the optimal programme delivery model to ensure that integrated capability is introduced into service at the speed of relevance.

What

We will increase the pace at which we adopt and exploit cutting edge technology. The Maritime Force will use a blend of techniques; CADMID, MOTS/COTS, Spiral Development, Pipeline Approaches, capability insertion opportunities, technology accelerators and other novel approaches; to enable agility and speed. We will work x-DLoD from the outset, and will use an embedded understanding of the Design Principles to militate against an 'equipment LoD' bias. We will have the courage and confidence to stop when and if a capability can no longer meet the operational requirement at delivery.

Section 4 – How the Maritime Force delivers

Insights/Key Judgements

- The Maritime Force is designed for integration and is intellectually multi-domain already.

- The Maritime Force is unique in providing contingency in use. It offers the contingent capabilities to Warfight, whilst simultaneously delivering Sub-Threshold effect.

- Enabling Maritime Force effect requires a continued focus on the force as part of an integrated whole – including the structures and systems which enable this – and not as a collection of physical assets.

- The Maritime Force will continue to become more assertive in posture, especially when competing with our adversaries Sub-Threshold.

- The Maritime Force will be designed with the capability to conduct Special Operations from the outset.

- The Maritime Force will be organised around four force level outputs: Homeland and Operational Advantage in the North Atlantic; Persistent Engagement; Carrier Strike; Littoral Strike.

- The Maritime Force provides high utility across the IOpC operational framework.

The MarOpC provides a single and simplified articulation of how the Maritime domain contributes to the Integrated Force and to delivering integrated action. This is orientated around the MDI decision action cycle, where Defence's ability to 'sense', 'understand', and 'orchestrate' effects occurs at an optimal tempo as a result of combining activity across domains to amplify effect. This includes employing the full range of lethal and non-lethal capabilities.

Maritime Force Characteristics

Integrated by Design

The MarOpC describes a Maritime Force designed for integration. To incorporate and include, not just the force elements, but also the effects and dependencies of other domains, and of allies and partners. Commonality of digital architecture is the vital ground of integration by design, but culture, training, education and C2 also contribute extensively.

Multi-Domain Integration (MDI)

The Maritime Force is intellectually multi-domain already; the nature of delivering the Deterrent, operating Carrier Strike and Littoral Strike, projecting Commando Forces, and undertaking Defence diplomacy demand a thorough appreciation of the interplay between domains. The next steps are: to ensure interoperability across domains; to increase the pervasion of this multi-domain understanding such that sub-tactical decisions are intuitively taken in a multi-domain context; and to deepen the collaboration across domains, realising the Defence intent of the posturing of military capabilities in concert with other instruments of national power, allies and partners; configured to sense, understand and orchestrate effects at the optimal tempo, across the operational domains and levels of warfare. For the Maritime Force, we will deliver:

- Improved MDI by focusing on Operational Advantage in the North Atlantic and Commando Forces as exemplars, while capturing lessons and opportunities for MDI from experience.

- Enhanced C4ISR capability, including increased integration across Defence and Partners Across Government (PAG) and greater coherence for Sense, Understand and Orchestrate capabilities[42].

- Changes to C2, organisation, culture, processes and people in line with Defence MDI development (driven by the MDI CP and through the MDI Maritime Coherence Group)[43].

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[42] Sense, Understand, Orchestrate framework as defined in JCN 1/20 - Multi-Domain Integration.

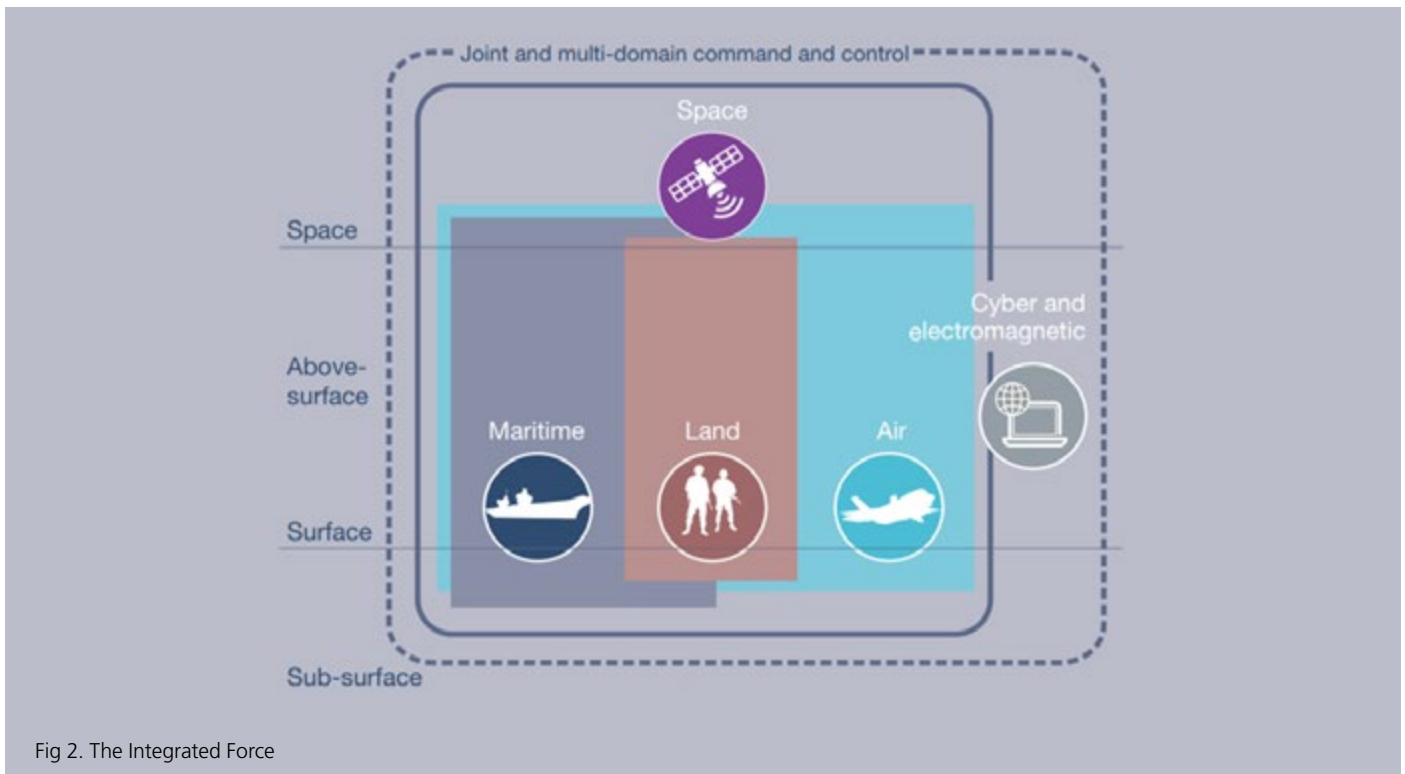[43] Including Agile C2 iaw JCN 2/17.

Fig 2. The Integrated Force

Contingency in use

The Maritime Force is unique. It offers the contingent capabilities to Warfight, whilst simultaneously delivering continuous Sub-Threshold effect. This contingency to Warfight is held ready; able to act at the speed of relevance globally.

Posture

The Maritime Force will continue to become more assertive in posture, especially when competing with our adversaries Sub-Threshold. This will mean becoming more comfortable accepting and taking risk.

Designed for Special Operations

The Maritime Force will be designed with the capability to conduct Special Operations at its heart (people, training, policy and doctrine as well as equipment). Hitherto, Special Operations have largely been designed and resourced at the point of need – on the operational edge. This artificially limits options to that which are available. By using Lessons from Experience, strategic intelligence, operational analysis, and intelligence preparation of the environment, the Maritime Force will be designed with the capability to conduct Special Operations from the outset. This will increase choice and utility for delivering operational effect and will afford a further vector for increased lethality.

Force Level Outputs

These are the highest level, and unifying, organisational principles for the Maritime Force.

- Homeland and Operational Advantage in the North Atlantic: An integrated Maritime Force, with NATO at the heart of the RN; protecting our homeland and our allies.

- Persistent Engagement: A high utility force optimised to deliver persistent global presence.

- Carrier Strike: The heart of the Maritime Force's – and NATO's – warfighting capability built around QEC.

- Littoral Strike: A persistently engaged and technologically enabled Commando Force capable of strike and Special Operations, whilst retaining the ability to reaggregate for Warfighting.

These Force Level Outputs are the structural fundaments from which capabilities and effects are drawn to deliver the demand set by IOpC.

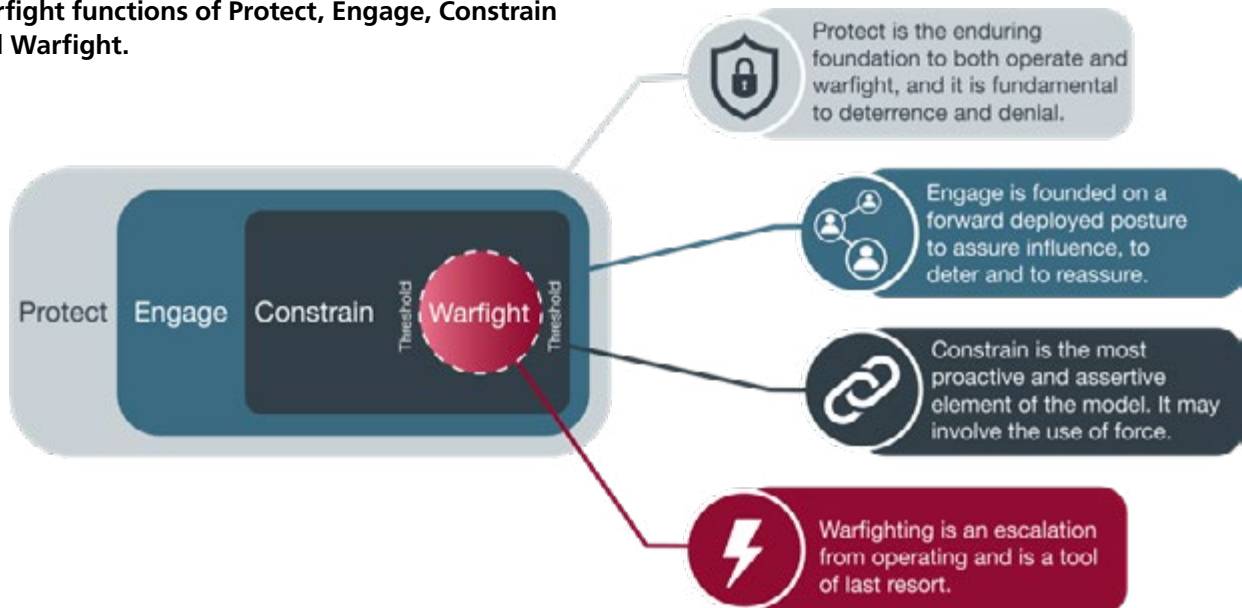**Maritime Force outputs through the operate and warfight functions of Protect, Engage, Constrain and Warfight.**

Protect is the enduring foundation to both operate and warfight, and it is fundamental to deterrence and denial.

Engage is founded on a forward deployed posture to assure influence, to deter and to reassure.

Constrain is the most proactive and assertive element of the model. It may involve the use of force.

Warfighting is an escalation from operating and is a tool of last resort.

Protect Engage Constrain Threshold Warfight Threshold

Fig 3. The IOpC Framework

Delivering the IOpC

The execution of activity across the PEC-W framework is neither linear nor sequential. The Maritime Force – by virtue of being a contingency force in use – is capable of delivering simultaneous effect across PEC-W. For example, a planned Carrier Strike Group deployment may conduct engagement activity with allies, constrain an adversary's freedom (by action or threat), contribute to conventional deterrence, and provide a contingency for crisis response. This simultaneous effect is best accomplished within a campaign framework and with objectives planned in strategic context.

The Maritime Force – illustrated by the prominence given to Persistent Engagement as one of the four Force Level Outputs – is configured to Sense, Understand, and Orchestrate forward. This approach relies on the alignment of: appropriate authority and permissions; sufficient understanding (information and intelligence); and adequate resource. This is the C2 Edge and permits action at the speed of relevance.

Protect

A resilient force capable of superiority both above and below the water, delivering a cross-Government integrated response, safeguarding our people, our economy and our way of life.

Integrate:

- Integrated C2. Contributing to a revised C2 model, the Maritime Force will support Defence and the Cabinet Office to deliver Fusion Doctrine Afloat enhancing commitment and contribution to nationally coordinated activity.

Secure:

- Secure to operate. The Maritime Force will develop and enhance an operationally aware security approach for the Whole Force, driving appropriate protection of sensitive information, gaining a clear appreciation of the threat and risks, and prioritising the measures needed to preserve and protect operational advantage.

- Security of the Strategic Homebase, Overseas Territories and Strategic Hubs. This remains a cross-Government responsibility, but the Maritime Force is a key element. Hybrid warfare, sub-threshold activity and strategic reach make the Strategic Homebase, including Critical National Infrastructure, Overseas Territories and Strategic Hubs, key terrain for adversaries, blurring the previous distinction between threats at home and abroad.

- Secure Defence & CNI. The Maritime Force will gain and hold operational advantage in the Underwater Battlespace.

- Military Data Gathering (MDG). Contributing to operational advantage through technology-driven, platform/service agnostic, optimised Collect, while continuing to leverage and exploit GEOINT sharing agreements with partners and allies.

- Dominate the above water battlespace, focused on surface threats, surrounding the strategic Homebase, establishing an enduring, visible, assertive and forward posture in the North Atlantic to increase the deterrence effect to reduce hostile state, non-state and criminal activity. Routine forward operations around the UK utilising multiple crewing models which blend Regular, Reserve and commercially contracted solutions in a Whole Force approach will optimise platform availability, reduce notice-to-effect times and enhance mass effect.

Respond

Respond & Support. Optimised Mine Warfare Capability to increase mass and develop a modernised capability (e.g. MHC) in support of CASD and strategic ports (both commercial and military), ensuring continued support to standing NATO commitments alongside an expeditionary capability. Improved platform availability and performance will be enabled by advancing the de-commissioning of aging platforms and integrating crewed, uncrewed, remote and autonomous systems.

- Ready to respond as part of Defence and wider cross-Government resilience operations. Traditional support will be complemented by more focused, agile, and high-end response options supporting cross-Government agencies and routine constabulary activity upstream of national crises.
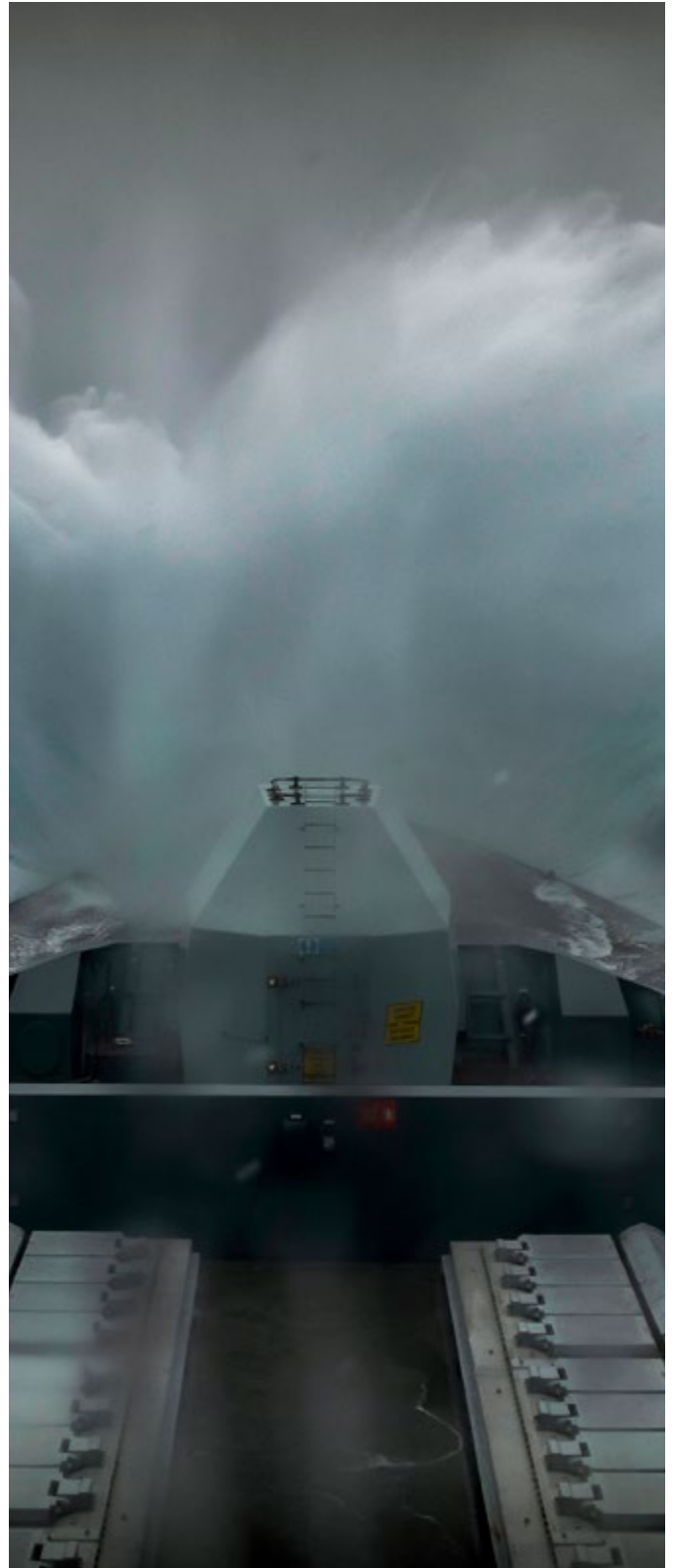
Engage

A force capable of deploying and sustaining Task Groups, Task Units and personnel around the globe, at sea and ashore, engaged with agencies and partners. This mosaic of persistent engagement offers strategic agility and political choice to project the UK's global influence.

Enhance understanding through the development of the global network:

- Global Network. The Maritime Force will contribute to, and leverage from, Defence's global network, including reinforcing where appropriate. This expands beyond the traditional attaché footprint, and will include exchange and embedded personnel, and nodal support solutions. This will build trust and enhance influence.

Develop partner capacity:

- The Maritime Force will surge capacity building expertise where Defence seeks to establish, maintain or enhance global influence. Fusion of a modernised Commando Force and Naval Special Operations will enhance the Royal Navy's ability to support the delivery of Special Operations Forces' capacity building. The Commando Force will be routinely forward deployed and capable of operating at reach and with greater precision, adaptability and survivability. Training teams will work in sensitive or high-risk areas focussing on building the capacity of partner nation Commando and Special Operations Forces capabilities; in parallel to delivering information advantage operations and providing a basis for rapid crisis response. This is a profound step-change to how capacity building is currently delivered.

Reassure:

- The synchronised delivery of capability, ranging from the deployment of a Carrier Strike Group, a Short-Term Training Team or the integration of personnel in an allied HQ will mark a shift from transient to persistent Maritime Power. Trust cannot be surged in crisis, and where there is constant competition there must be persistent engagement.

Engage to enable:

- Persistent Engagement will be routinely delivered through the enduring attribution of Forward Deployed B2OPVs, T31s and LRGs. The routine delivery of effect is not dependent upon, nor defined by mass. Instead, Effect is the metric used, with the capabilities routinely attributed to Engage activity optimised for this task.

- Expeditionary approach to logistics, engineering and equipment support will enable hull and crew rotation, maintenance and training to take place while forward deployed; increasing productivity and number of operational days.

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- Expeditionary approach to logistics, engineering and equipment support will enable hull and crew rotation, maintenance and training to take place while forward deployed; increasing productivity and number of operational days.

Support strategic communications:

- The Maritime Force has an enduring history of delivering global influence on behalf of the UK and strategic allies. This will continue, but must increase in sophistication, nuance and use a targeted approach. Persistent Engagement delivers greater integration with partners and allies, enhanced regional understanding, reveals opportunities to compete which would otherwise go undetected, and opens apertures for sub-threshold activity or offset effects.

- Multi-domain and cross-Government Information Advantage. The Maritime Force will continue to will drive Multi-Domain Integration into the heart of all operational activity. We will deliver effect across and in support of other domains, and we will exploit opportunities created in other domains, amplifying effect and posing our adversaries multiple simultaneous dilemmas. Every capability will function as a sensor to harvest, analyse, and ultimately exploit information and influence on behalf of Defence and wider Government.

Cooperate with adversaries:

- Cooperate to de-escalate. The Maritime Force will engage with non-traditional allies and partners to foster greater military understanding; exploiting common Defence interests to enhance trust and awareness, reduce the risk of miscalculation and provide the potential to de-escalate strategic and political tension by offering additional vectors for influence[44].

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[44] In line with Defence and national strategic direction.

Constrain

A force capable of influencing a competitor's decision calculus by conventional and asymmetric methods, as part of a fused approach and delivered through Integrated Action. In concert with the wider Integrated Force, the Maritime Force will engage in Constrain activity to attain local escalation dominance and impose our will upon our adversaries.

Reinforce partners:

- The Maritime Force will deter and compel adversaries through a collective posture, seeking to 'Internationalise' issues by reinforcing and seeking reinforcement from partners. Task Groups provide a proven framework to deliver this collective posture and generate mass (physical and political) to increase the risk to adversaries.

Constrain adversaries' freedom of action:

- The Maritime Force is routinely deployed across the globe, enabling and assuring access to adversaries' spheres of influence. By managing the intensity and focus of maritime effects, nested within a fused Cross-Government effort, maritime operations offer agility in competitive environments; enabling pressure to be applied to an adversary below the threshold of conflict. Maritime attributes allow horizontal and vertical escalation options to compel an adversary or force a course of action; before rapidly de-escalating. The Maritime Force will introduce risk to a competitor by denying their freedom of action and dominating the physical and virtual terrain through overt or covert, lethal or non-lethal activity. This will include contributing to the attribution of malign actions.

Control key terrain (areas of strategic interest):

- Restrict freedom of manoeuvre to seize the initiative and support partners through sea denial and more asymmetric activities, such as control of the electro-magnetic spectrum and information environment. Maritime power will also be used to degrade adversary influence by operating across the information domain and pre-empting or countering sub-threshold activity through targeted Information Operations. Reducing an adversary's ability to exploit the CEMA battlespace will contribute to own force Information Advantage. Using the strength of a global reputation and co-operation in the virtual and cognitive domains, the Maritime Force will generate friction and expose malign behaviour.

- The Maritime Force will deny access to maritime Key Terrain by establishing synchronised Sea Control[45]. Increasingly achieved by integrating control of the air, cyber, space and electromagnetic activity, owning the media narrative and influencing the land domain. Ensuring freedom of manoeuvre and navigation for maritime trading routes and access to the littoral below the threshold of conflict (engagement without embroilment) will deter and compel an adversary course of action.

- Global Offset Action. The ability to deliver 'off axis' effects, including Naval Special Operations, will introduce increased risk to an adversary's decision calculus, in and from the maritime domain[46]. Naval Special Operations will blend all elements of the Maritime Force to deliver Special Reconnaissance, Military Assistance and Direct Action. Strategic Raids will degrade military capability and the temporary seizure of key terrain will counter fait accompli strategies.

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[45] Bounded in space and time to the limits necessary to produce effects/accomplish objectives.

[46] i.e. avoiding symmetrical responses such as 'covering' vulnerabilities when held at risk by an adversary, and instead applying pressure to correspondingly valuable adversary vulnerability. Especially effective when offset by operational/strategic geography, operational/effect type, and time. Offsets are not tactical actions.

Demonstrate resolve:

- The Maritime Force can rapidly reconfigure from persistent engagement to focus power towards an adversary, delivering multiple distributed points of pressure and dilemmas; offering a greater degree of horizontal escalation in addition to traditional demonstrations of power which contribute to vertical escalation. The ability of Maritime assets to poise over-the-horizon or exercise Freedom of Navigation demonstrates power while helping to control the pace of escalation.

Influence adversaries' decision making:

- Dominate the Virtual Terrain to deliver integrated advantage. Operating in or near to adversaries' area of operations either overtly or covertly will provide opportunities for collecting information. Early digitisation will enable rapid processing, exploitation and dissemination of data to act and react in the information environment faster than an adversary.

Warfight

A force capable of influencing a competitor's A powerful force that uses leading edge technology and innovative operating methods to fight and win, and quickly.

Competitive Command and Control:

- Command and Control. The Maritime Force will contribute to an agile and integrated C2 framework that can fuse information with the Integrated Force, other Government Departments and international partners. Data analytics, machine learning and computer-assisted decision making will be fundamental elements of machine-speed warfare, allowing Task Group and disaggregated Command and Control; enhanced significantly by reach-back for data processing and analysis.

Rapidly enhance, or surge:

- Surge Forces. The Maritime Force will rapidly aggregate force elements into an area of operations – including those persistently engaged, exploiting manoeuvre through international waters, to deliver and communicate credible capability; often acting as the first responder and helping to set the theatre. Littoral Response Groups will rapidly re-aggregate into a Littoral Strike Group, and, alongside the Carrier Strike Group, may subsequently form an Expeditionary Strike Force; supporting and supported by partners and allies. The continuous and adaptive use of information and systems can deliver an asymmetric surge of effect to degrade, deny or disrupt an adversary early in a conflict.

Defeat with precision at reach:

- The ability to defeat adversaries is fundamental to the credibility of the Maritime Force; diminished confidence here undermines any deterrence. Warfare in the maritime does not require the ability to permanently overmatch an opponent in every aspect, but to bring battle-winning effects to bear at the optimal time and location, in combination with wider Integrated Force effects.

- Capabilities in the Close Battle. The Maritime Force will deliver precise lethal strike from a variety of crewed and uncrewed platforms, using GPS and non-GPS guided systems. It will be decisive, secure access and support cross-domain Integrated Action. Uncrewed systems will increase precision, lethality and reach while reducing risk to life.

- Integrated Force Freedom of Manoeuvre. The Maritime Force will gain access to unlock manoeuvre by detecting and reacting to early signs of hostility to secure theatre entry for the Integrated Force. Whilst not always necessary to fight for theatre access, the combination of capabilities and effects within the Maritime Force underwrites the strategic requirement to gain access, by force if necessary. An inability to force access undermines the credibility of the Integrated Force.

- Engage with Precision at Range. The Maritime Force will deliver debilitating lethal and non-lethal strike effects upon the adversary, building on CONSTRAIN activity and supported by other agencies. The range at which these effects can be delivered will be extended, enabling us to hold adversary capabilities at risk, at range, sooner and for longer. Employing techniques across the Information and Cyber environments and along the spectrum from simple messaging to facilitating cyber operations, the Maritime Force will contribute to strategic choice through speed and cognitive agility.

- Enabling strategic deception is critical for assuring theatre entry. The Maritime Force will target adversary's sensors and information collection assets through spoofing and distraction to generate friction, uncertainty and paralysis within adversaries' organisations, causing information overload and masking operational intentions.

Resource de-escalation:

- Secure and Exploit Gains. The flexibility inherent in the Maritime Force will secure advantage through a tailored response before re-balancing presence, posture and profile to exploit early gains. Strategic adaptability also enables the Maritime Force to rapidly re-locate and seamlessly transition between ENGAGE, CONSTRAIN and WARFIGHT; providing greater operational and political choice.

Dependencies

- **Cross-Whitehall.** The Maritime Force will depend upon cross-Whitehall/Partners Across Government for integrated strategic direction and for the delegation of appropriate operational and tactical freedoms. The Maritime Force will contribute to Sense and Understand, especially in the Maritime Domain, and will provide assured Sovereign choice for deliberate or contingent activity.

- **All domain enablers.** The Maritime Force has myriad dependencies on Defence's limited enabling capabilities. Most critically, there is a dependency for prioritisation, allocation and availability. An increase in Persistently Engaged Force Elements will drive a commensurate increase in demand on Strategic Movements, including Access, Basing and Overflight. Fig 4 (below) lists the specific dependencies.

- **Space.** The Maritime Force has dependencies on Space for Intelligence Surveillance and Reconnaissance (ISR), Position, Navigation and Timing (PNT) and Satellite Communications (SatCom). It depends upon, and contributes to, missile warning and tracking. Further work will need to address operations in, and recovery from, a Command and Control Denied and Degraded Environment (C2D2E).

- **Cyber and Electro-Magnetic Activity (CEMA).** Cyber and electromagnetic activities (CEMA) are interdependent and within the electromagnetic environment (EME). The Maritime Domain depends on CEMA for access to the EM environment, to provide situational awareness, targeting, platform protection, position, navigation and timing (PNT), information, joint secure CIS provision and defensive Cyber and EM operations. Spectrum Management is essential to maintain operational advantage in a C2D2E. The Maritime domain may be supported by offensive Cyber and EM operations which seek to influence adversary behaviour or degrade adversary C3 capability. The Maritime domain may enable the delivery of offensive Cyber and EM operations through the projection of platforms and special operations.

- **Air.** The Maritime Force depends upon the Air Domain for the delivery and development of (in collaboration) strike, uncrewed systems, and air defence. Especially considered in the context of Carrier Strike, this is a collaborative endeavour. The Maritime Force provides power projection through the delivery of Carrier Strike and land attack weapons. Elements of Access, Basing and Overflight are also Maritime Force dependencies.

- **Land.** The Maritime Force has dependencies on the Land Domain for elements of Force Protection, Ground-Based Air Defence and UK Resilience. Land is also the lead TLB for land systems and rotary wing; both of which are key dependencies for the Maritime Domain. The Maritime Domain delivers Theatre Access, enabling Land Domain Theatre Entry, as well offering avenues for offset, assures strategic lines of communication, and underwrites the Protection of the Homebase by denying physical access to an adversary.

Section 5 – Force Level Outputs

Insights/Key Judgements

- The Maritime Force will be organised around four Force Level Outputs: Homeland and Operational Advantage in the North Atlantic; Persistent Engagement; Carrier Strike; Littoral Strike.

- The four Force Level Outputs are mutually supporting and are not exclusive.

- A clear focus on strategic priorities will be needed. Demand will outstrip resource if the Maritime Force is insufficiently focused.

The four Force Level Outputs are mutually supporting and are not exclusive. Each draws on aspects and attributes of one or more of the other three to achieve effect in combination. They provide the highest level, and unifying, organisational principles for the Maritime Force.

Each Force Level Output is covered in detail in separate sub-concepts. This section sets out the why and how, not the what, for the Force Level Outputs.

Maritime Force Characteristics (common to all)

- Integrated by Design

- Contingency in Use

- Assertive posture

- The best technology

- The leading European Navy in NATO; a Warfighting contribution orientated around NATO

- Optimised for a campaign approach

Homeland and Operational Advantage in the North Atlantic

An integrated Maritime Force, with NATO at its heart, protecting our homeland and our allies.

Homeland Defence/Warfighting. Includes the attribution of CASD, Carrier Strike, and Littoral Strike capabilities (LRG(N)) to NATO as a pillar of Defence and Deterrence in the Euro Atlantic; seeks a more assertive posture which regains operational advantage. Key outcomes:

- Protection of strategic interests and CNI, including Maritime Counter Terrorism and Maritime Security in the UK's TTW and EEZ.

- Ensure freedom of manoeuvre in the North Atlantic.

- Maintain CASD for UK and NATO.

- Lead nation in NATO MARCOM.

Capability Features:

- An underwater system of systems which dominates in a networked and digitised battlespace.

- Operating in concert with remote, autonomous and uncrewed platforms.

- Semi-autonomous mother submarines employ UUVs to survey otherwise inaccessible areas or distract/confuse surface/UW enemies.

- Autonomous UUVs covertly deploy payloads and sensors, survey UW routes, CNI or other sensitive areas.

- Small fleets of rotary wing UAVs working in concert to deploy sonobuoy fields to find enemy submarines.
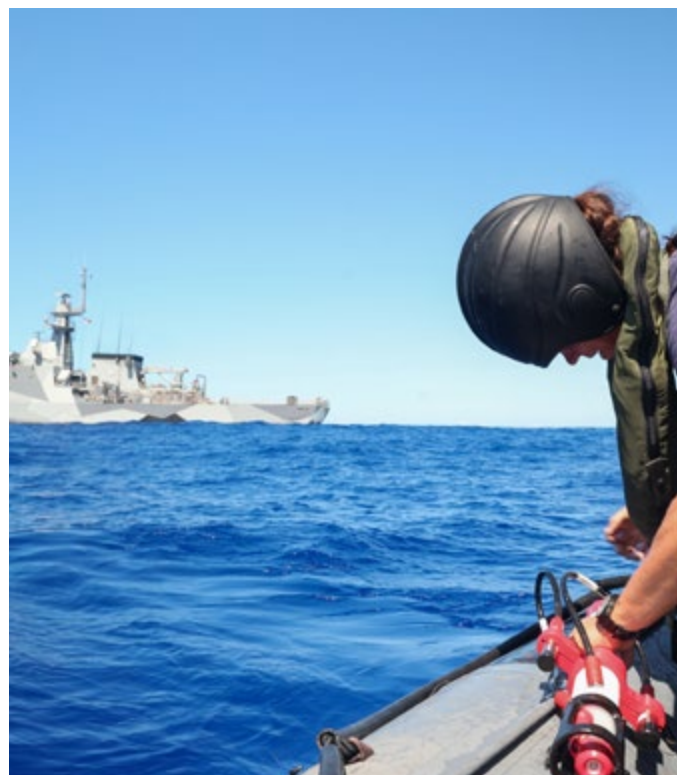
Persistent Engagement

A high utility force optimised to deliver persistent global presence, with Littoral Readiness Groups at the heart.

Persistent Engagement: Contingency/Persistently Engaged. Persistent deployment in strategic locations across the globe to promote UK interests, deter adversaries and prevent conflict.

- Engage, support and deepen existing alliances and partnerships whilst establishing new and enduring relationships with emerging regional powers; particularly in the Indo-Pacific region.

- Provide a global and persistent footprint and operate as Britain's contingency force in use with ever more ships and forces deployed on an enduring basis.

- Outward manifestation of 'Global Britain', offering persistent presence – and influence - in areas of UK national interest.

- Preserve, promote and enforce RBIS and Freedom of Navigation and access.

- Informing governmental decision making, acting early to mitigate crises at source.

- Counter violent extremism and organised crime.

- Enabling and executing Special Operations.

Capability Features:

- Forward deployed units are better prepared, more experienced and attuned to their surroundings than those held at readiness in the UK.

- Task Units equipped to independently Operate but not Warfight alone.

- Task Units equipped for self- and local- defence, but not area defence.

- Not sufficiently survivable to fulfil high-end warfighting roles in peer plus warfighting scenarios, unless as part of a wider Maritime Task Group.

- Open-architecture to enable adaptability.

- Sensor suites which contribute to Sense and Understand.

Carrier Strike

The heart of the Maritime Force's – and NATO's – warfighting capability Built around the Queen Elizabeth Class Aircraft Carriers.

Carrier Strike: Homeland Defence/Contingency/ Warfighting. Contribute to OANA. Through deployments to strategic locations across the globe, promote UK interests, deter adversaries and prevent conflict.

- Project decisive air power from a protected maritime task group, including gaining and retaining the necessary degree of sea control to ensure Freedom of Manoeuvre.

- Demonstrate Global Britain, with regular deployments openly demonstrating British will to engage and resolve to act.

- Contribute to UK/NATO warfighting capability, as a more lethal and more integrated Maritime Force.

- Enable and execute Special Operations.

Capability Features:

- Driven by digital, harnessing innovation and technology to deliver and optimise autonomy, integrated with the Naval Strike Network.

- Mass and Reach enhanced by improved lethality. From investment in autonomous and optionally crewed capabilities.

- AI and Machine Learning adopted to speed up decision making, enhance Integrated Action and ever more closely integrate Carrier Strike and partners.

- Lead international collaboration and leverage international advantage through inter-changeability.

Littoral Strike

A persistently engaged and technologically enabled Commando Force capable of strike and Special Operations.

Littoral Strike: Contingency/Crisis Response/ Warfighting/Persistently Engaged. Through LRG(N) contribute to OANA. Alongside regional partners, conduct capacity building and Counter-Hostile State Actors, provide a focus for Naval Special Operations and able to respond to crises. Commando Forces apply precise effect as part of an alliance or Sovereign action. They support Theatre Access by countering defensive systems and shaping the battlespace.

- Prevail against non-traditional threats in sub-threshold competition.

- An amphibious advance force able to ensure rapid entry to the fight.

- Assertively and pre-emptively shape the battlespace and strike ashore.

- Retain, at very high readiness, the capacity to act, especially in concert with PAG and in the execution of Naval Special.

- Demonstrate Global Britain, and the resolve to act.

- Maritime Forward Presence. Sea-basing, operational manoeuvre and Maritime Interdiction options.

- Special Operations and Crisis Response. Special Operations capable force elements persistently forward and engaged.

- Hybrid Warfare. Cross-government integration for complex operations.

- Shaping Operations. Commando Forces optimised to shape the battlespace for follow on forces.

Capability Features:

- Driven by digital, harnessing Enable Multi-Domain Integration.

- Disperse the force but improve connectivity.

- Invest in Allies, Agencies and Partners.

- Improve the 'Power/Weight ratio'.

- Precision Strike.

- C4ISR and Intelligence.

- Autonomous Strike Networks.

- Operational and Tactical Mobility.

- Ability to execute Operational and Tactical Deception.

- Liaison / Reconnaissance.

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