



Future Maritime Operational Concept



THE FUTURE MARITIME OPERATIONAL CONCEPT 2007

Dated 13 November 2007

Authorised by the Joint Doctrine and Concepts Board

A handwritten signature in black ink, appearing to read 'C. Sperry', with a long horizontal stroke extending from the bottom right.

Director General
Development, Concepts and Doctrine

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INTRODUCTION

101. The UK is a maritime nation whose prosperity, stability and security depend on the unique access provided by the sea and the maintenance of an international system of law and free trade. Out to 2025, an increasingly interdependent, yet competitive world will be characterised by intense, but uneven globalisation, continuing tensions and rivalries between states, the accelerating exploitation of ocean resources and a variety of trans-national pressures. The UK will therefore need the means to continue to discharge its sovereign responsibilities and protect its political and economic interests in an era of increased maritime complexity and competition and as a result of more diverse dependencies on the sea.

102. In addition, all future projections emphasise the continuing requirement for security structures and capabilities to enhance vigilance, deterrence and dissuasion, in order to cope with unpredictable and rapidly changing situations, reinforce national and cooperative defence arrangements and deal flexibly with the symptoms of a wide spectrum of potential crisis. It is anticipated that, until a decisive discontinuity or shock occurs or a major military challenge emerges at sea, resource provision for these capabilities is likely to decline, or at best remain constant in real terms, in the face of the escalating costs of advanced technologies and competition from other areas of Government.

103. The UK deploys a broadly balanced maritime capability, whose operational attributes provide utility across the spectrum of likely threats and activity, enabling a flexible range of potential actions and reactions at a time and place of political choice. Centred on powerful, agile, versatile and scaleable Carrier Strike (CS) and Littoral Manoeuvre (LitM) Task Groups (TGs), the UK's maritime forces consist of dynamically force-packaged Naval and Joint assets capable, through sustained reach, of offering the possibility of controlling and exploiting every dimension of the Maritime environment¹ and of projecting power against the Land. This balance of capability enables the UK to provide strong support to the US and NATO, to maintain leadership or framework status among European or less familiar partners and to preserve a balanced national ability to act independently when circumstances demand. Against the baseline of current or projected capability, the Future Maritime Operational Concept 2007 (FMOC 07) examines the context within which maritime forces will operate and evolve out to 2025.

Aim

104. This Concept provides the contextual basis for military activity in the Maritime environment, out to 2025, in order to guide capability development and stimulate further conceptual work.

¹ Air, surface, sub-surface, electromagnetic and information.

Provenance

105. FMOC 07 is an Environmental Operational Concept, based on the Policy outlined in Defence Strategic Guidance 2005 (DSG 05),² modified by emerging thought ahead of DSG 08 and by the High Level Operational Conceptual Framework (HLOC). It is consistent with, and complements, other Environmental Operational Concepts and the Joint Interim Concepts (JICs). In association with the JICs, FMOC 07 provides the conceptual underpinning for subordinate conceptual products, especially Concepts of Employment (CONEMPs) and Concepts of Use (CONUSEs), and should be read in conjunction with the detail provided in the authoritative and published LitM and CS Hybrid Interim Concepts.³

Scope

106. FMOC 07 is an Analytical⁴ Concept that examines how the strategic context and the character of the future maritime environment will shape the development and operation of Maritime forces. In accordance with anticipated Policy guidelines, it describes an integrated, expeditionary capability designed to prevail in the most demanding circumstances and configured to support the decisive achievement of political expectations and strategic objectives. Set within the philosophy of the Effects-Based Approach (EBA), Joint Action and a Comprehensive Approach (CA),⁵ it confirms the enduring attributes of naval forces - Access; Mobility; Versatility; Resilience; Sustained Reach; Lift Capacity; Poise; and Leverage.⁶ The paper then describes how Maritime forces can be used to realise effects and achieve favourable outcomes, both in relation to potential opponents and in dealing with complex situations. Throughout, Maritime forces are 'those systems, platforms and vehicles, together with their associated personnel, that are able to operate in the Maritime environment'.⁷

107. During the period envisaged by this Concept, the submarine-based national Strategic Deterrent will remain the ultimate guarantee of the UK's security. Its conceptual justification and continued evolution are subject to specific political direction, specialist staffing and discrete development mechanisms. As such, except where Maritime and other forces are required to support and protect it, the Strategic Deterrent and its associated systems will not be considered.

² Policy direction is also derived from: the Strategic Defence Review (SDR) and SDR New Chapter, the Defence White Papers of 2003 and 2004 (DWP 03/04).

³ LitM - DG DC&D's DCDC/DG/Letters dated 27 June 2006. CS - CSPB endorsement dated 31 January 2006.

⁴ Analytical Concepts are generated in response to changes in Policy, future trends and innovative thinking as the contextual basis and authority for the development of subsequent Interim and Applied Concepts.

⁵ As described in JDN 7/06 'Incorporating and Extending the UK Military Comprehensive Approach' dated September 2006.

⁶ BR 1806 'British Maritime Doctrine' (3rd Edition). However, Versatility and Resilience need to be subsumed into Agility - defined in 'British Defence Doctrine' (3rd Edition) [programmed for promulgation late 2007] as: Responsiveness; Resilience; Flexibility; Acuity; and Adaptability.

⁷ Including those elements in footnote 1.

Structure

108. FMOC consists of 3 parts. Part 1 provides a synopsis of the Future Operating Environment as articulated in the Operate Joint Interim Concept⁸ with regard to the maritime environment, Part 2 describes how Maritime capabilities will be delivered in the future environment and Part 3 explores the implications for further conceptual and capability development.

PART 1 – THE STRATEGIC CONTEXT OUT TO 2025

Global and Maritime Context

109. **Global Context.** The strategic environment of the next 20 years will be characterised by rapid change, unpredictability, instability and increasing interdependence. Trans-national issues, such as terrorism, climate change, demographic shifts, religious and ethnic tensions and increased competition for resources of all kinds will provide the potential for crisis, confrontation and conflict. Sovereign states and a diverse range of non-state activists⁹ will vie for influence and advantage against a backdrop of economic competition and systemic political differences, and traditional alliances and partners may not always choose, or be able, to act. The intensifying competition for resources, particularly energy, raw materials and possibly food, as well as rapid population growth and demographic imbalances, especially in littoral areas, have the capacity to threaten prosperity, stability and security at global, regional and national levels. Irregular Activity¹⁰ will continue to challenge and affect international peace and stability as well as exacerbating the problems of failed or failing states. The possibility of inter-state conflict still exists and may possibly increase from 2015-18 as a result of the uneven transition from a uni-polar to a multi-polar political landscape and a complex, interrelated range of trans-national problems.

110. **The Maritime Context.** The maritime scene will be dominated by 2 main themes out to 2025 – increasing littoral complexity and growing oceanic competition:

- a. **Littoral Complexity.** The littoral regions of the world already contain the bulk of the world's population and human activity. The next 20 years are likely to see a massive increase in urbanisation and settlement in the littoral regions (including into the sea), as well as a substantial proliferation of artificial structures, energy farms, power generators and aquaculture. Gas and oil pipelines and port facilities are also likely to increase in complexity and footprint. As well as the consequences of climate change, the effects of extreme weather and other natural events will also impact heavily on heavily populated and developed littoral regions.

⁸ DCDC Operate Joint Interim Concept PPSG Draft dated 7 September 2007.

⁹ For example, religious and ethnic groups, environmental activists, corporate entities and terrorist organisations.

¹⁰ Irregular activity encompasses criminality, disorder, insurgency and terrorism and is explored in depth in JDN 2/07 'Countering Irregular Activity within a Comprehensive Approach', published March 2007.

b. **Oceanic Competition.** The high seas, the deep ocean and the Polar regions¹¹ are likely to become areas of increased competition as advanced technology, increased accessibility and resource pressure encourage more intensive exploitation by states and commercial interests. Competition will centre on fishing, deep sea mining and the extraction of oil and gas, but may possibly extend to transportation and rights of passage.

***Deduction:** In a globalised, interdependent world, the sea represents the prime means for the transmission of risk and opportunity across all dimensions of human activity and for dealing with the symptoms of a wide spectrum of crisis.*

***Deduction:** The UK's expeditionary strategy requires assured access to the sea in order to allow intervention and influence at a time and place of political choice.*

***Deduction:** The pace and range of globalisation mean that the UK will need to maintain an active presence at sea, with deployable military capabilities capable of operating across the whole conflict spectrum, in order to sustain economic growth, protect its interests and project influence in the wider world.*

***Deduction:** The risk of state-on-state confrontation and conflict from 2015-18 will require UK maritime forces to remain benchmarked at the war-fighting level, with a readiness profile and balanced force structure that can deter, counter and defeat a substantial enemy at sea, probably as part of an alliance or coalition.*

***Deduction:** Irregular activists will be a permanent feature of the maritime scene out to 2025. Action will be required to protect the international system, suppress terrorism and prevent the spread of Chemical, Biological, Radiological and Nuclear (CBRN) weapons and the diffusion of advanced, disruptive technologies.*

***Deduction:** The successful realisation of national strategic objectives will always rely on a coordinated application of the diplomatic, economic and military instruments of power through a CA both at sea and especially in relation to the land.*

111. **New Political Alignments.** The realignment of the major powers will see the US' hegemonic status, particularly at sea, in competition with China and India, a more confident Japan, regional aspirants like Iran, Brazil and South Africa and a resource rich and increasingly assertive, antagonistic Russia. Democratic states will also be confronted by states that embrace globalisation and capitalism, but which retain totalitarian or non-democratic forms of government. In addition, it is likely that some states, possibly in Europe's near abroad, will find it difficult to maintain governance and order in the face of intensifying competition, the consequences of climate change and wider global and demographic pressures.

112. **Natural Events.** Owing to climate change and the increasing exploitation of marginal areas for human settlement and exploitation, the impact of natural events

¹¹ As well as on the airspace above.

will be progressively magnified. Seismic activity, rising sea levels and inundation, together with the likelihood of more frequent extreme weather events, will particularly affect littoral regions where the bulk of human activity takes place. In some areas, there will be significant geographic disturbance and change. The progressive thawing of the North polar ice-cap, the opening of the North-East and North-West Passages and increased accessibility across the top of the world will introduce new sources of risk and opportunity, as the topography of the region alters.

***Deduction:** Deployed Maritime forces are likely to have to operate in an increasingly crowded and complex environment in which they will need to be able to act quickly in response to indications of crises and unexpected situations. As a minimum, they should be capable of self-protection and self-extraction, but also able to make an immediate, effective contribution to the UK's objectives and be capable of rapid reconfiguration and reinforcement in the area of crisis or conflict.*

113. **Access.** The UK will maintain significant investments abroad and about 8 million of its citizens will live and work in other countries. Ninety percent of trade by bulk will continue to travel by sea, as well as the greater proportion of expeditionary materiel and sustainability. Economic interests will remain in globally dispersed UK-flagged and other vessels and their cargoes, a high degree of dependence on offshore oil, natural gas and pipelines bringing those commodities to the UK, in fish stocks and on mineral reserves on the seabed, as well as increasing networks of offshore installations and sites. Considered in the context of a more diverse range of dependencies on the sea, globalisation therefore means that any threat of interference with trade routes or the resources and installations that are essential to the prosperity and stability of the UK economies needs to be deterred and, if necessary, defeated. In an increasingly competitive world, it is likely that regional powers and states, will seek to limit the freedom of the seas and the provisions of United Nations Convention on the Law of the Sea (UNCLOS) for geo-political, environmental, economic and military reasons, by extending their jurisdictions and introducing control regimes. In response to developed nations' expeditionary strategies, assertive, aspiring and adventurist powers will invest heavily in anti-access, surveillance and sea denial systems and technologies.

***Deduction:** Legitimate access to, and use of, the sea are critical to the health of the UK's economy and stability. Priorities for the maritime defence of the UK and Overseas Territories need to be complemented by effective bolstering of the international system. The UK will wish to retain the rights to freedom of navigation, particularly in the small number of strategically significant routes and maritime choke points.*

***Deduction:** Maritime forces must demonstrate their ability to exploit the lawful use of the sea through poise, reach and manoeuvre to intervene at a time and place of political choice and to project power, both at sea and against the land.*

114. **Personnel.** Sufficient numbers of civilian and military personnel prepared and trained to work and operate in the challenging maritime environment will be needed across an increasingly diverse spectrum of activities, specialisations and occupations. In particular, specialists will be required and expertise retained in areas of marine science and maritime exploitation where there is likely to be intense competition for specialist personnel. As the demographic and economic features of the UK change, the ability to recruit, train and retain these personnel will become even more challenging, although a downturn in the economy may ease this pressure.

Technology

115. **Capability Growth.** Accelerating technological developments will have major implications both for potential opponents and for the UK and its partners. All can call on specially designed or commercially available weapons and equipment that may have broadly similar capabilities. Indeed, off-the-shelf equipment is likely to be more accessible and versatile in an uncertain and fast-changing environment than traditional bespoke systems. Technology is also breaking down the divisions between the land, sea, and air environments, and is increasingly likely to provide access to previously under-exploited deep oceans, underground and Space. It will provide both friends and adversaries with the capability for widely dispersed military units to operate as complete, flexible systems or as modular components in a network, allowing closer coordination of manoeuvre, action and effect. Improvements in unmanned vehicles, robotics, loitering systems, precision weapons, weapons' platform design and engineering and signature reduction will lead to more precision and effectiveness in engagement. Similarly, modular construction techniques and increased reliance on commercially available equipment could provide the cost-effective means by which military capability can keep up with innovation. At the same time, substantial numbers of readily available area denial weapons and systems, as well as emerging disruptive and CBRN technologies, will make it more difficult for large, traditionally static forces to operate in geographically restricted areas without detection and, in some cases, disproportionate casualties, encouraging greater dispersion and agility of forces. Commercial satellite systems and space imaging, the proliferation of advanced surveillance and data systems and integrated communications technologies will lead to ever more transparency of military operations, while counter influence and influence activity will be a critical element of all forms of warfare. In every envisaged scenario, access to space based and other Command, Control, Communications, Computers, Intelligence, Surveillance, Target Acquisition and Reconnaissance (C4ISTAR) assets, and a balance of properly integrated Fires and Influence activity will be a critical, possibly decisive, enabler and force multiplier.

***Deduction:** Maritime based capabilities must harness the increased effectiveness (persistence, precision, discrimination) of Fires and Influence offered by emerging technology. This will allow maritime based capabilities to extend further into the Land, Air and Space environments while also exploiting their inherent manoeuvrability, thus potentially strengthening the options for Joint Action.*

Deduction: *Maritime units need an ability to exploit and contribute to the network. Access to the C4ISTAR assets, information and intelligence (i2) is necessary to support an effects-based philosophy by enabling better fusion and analysis of information, resolution of the battlespace (friendly, neutral and adversary, as well as the physical nature of the environment) and assessment of military activities. This will underpin the essential achievement of Shared Situational Awareness (SSA), and of better Shared Situational Understanding (SSU).*

Deduction: *Wider access to commercially available, capable and versatile equipment must not be allowed to limit or negate the technological advantage traditionally enjoyed by the armed forces of the UK and its partners. Conventional and irregular adversaries able to achieve sea denial, even if only for critical periods of time, will need to be countered. Access to non-traditional C4ISTAR¹² and IT applications will enable increasingly dispersed, remote and diffuse operations, thus placing added emphasis on the capability of UK and allies' C4ISTAR and the processing and dissemination of i2.*

Deduction: *In order for commanders to prevail, the precise features of a situation across all dimensions and disciplines need to be established. This means that a deployed force must have access to sufficient ISTAR, Reachout and data retrieval, to ensure that a comprehensive appreciation is obtained before Joint Action is employed to realise effect.*

116. **Cost Growth.** While the resources needed to procure and sustain some equipments and systems can be expected to diminish, the overall cost of advanced technologies is expected to rise, especially in an environment in which risk assessments will have to be based on vulnerabilities, in the absence of specific threats.

Deduction: *Procurement processes within, and in support of, the Maritime Industrial Strategy will need to be more agile if the potential for adversaries to benefit from technological superiority in key areas is to be reduced or negated. Focused R&D/R&T in this area will remain essential to effective capability management.*

Joint, Interagency and Multinational Implications

117. **Comprehensive and Effects-Based Approaches.** The interdependence of the global economy and community, the emergence of serious trans-national issues (including terrorism, migration, climate change and resource competition), and the reliance of the developed nations on a stable and secure international environment will continue to make it impossible to ignore a wide range of challenging, inter-related problems and contingencies. These are likely to be addressed in *ad hoc* coalitions, possibly in accordance with UN or regional mandates. Increasing sophistication and the drive for improved efficiency and effectiveness in developed

¹² For example, commercial systems and space imaging, advanced surveillance and data systems and media.

nations will encourage (if not require) the exploitation and integration of Joint assets, multi-agency initiatives and cooperative solutions in response to crises. Crisis management is therefore likely to become more subtle and dynamic, with some, notably developed, nations' governments, preferring to use non-military levers to deal with the causes of problems while retaining military options to deal with the more threatening symptoms. In many cases, therefore, an EBA/CA will be the basis of both campaign planning and execution if favourable outcomes are to be achieved.

Deduction: *In addressing complexity, Maritime Forces will need to use an EBA/CA to exploit the benefits of a cooperative culture and collaborative working.*

Appropriate training and career experience are needed to ensure that Joint and Maritime commanders and their staffs are familiar with the approaches of Other Government Departments (OGDs) and how best to exploit a harmonised coordination of effort.

Deduction: *Maritime forces require the means to inter-operate with OGDs, Non-Governmental Organisations (NGOs) and other civilian agencies, as well as with potential multi-national partners and ad-hoc coalitions, including those that have not adopted an EBA.*

118. **Multinational.** As a Permanent Member of the UN Security Council and to maintain influence with the US, the UK will wish to continue to play a leading role in NATO, Europe and the wider world. UK Maritime Forces have therefore to be capable of a reasonable contribution to the preservation of international peace and economic growth and a military commitment to confront actual and emerging crises. Technological interoperability, doctrinal cohesion and organisation will all be essential to ensure success. Combined training and experimentation with the US and other Allies and political partners will therefore be required, and Maritime Forces should foster a comprehensive system of actively engaged Liaison and Exchange Officers to develop mutual understanding, as well as encouraging doctrinal coherence and best practice. Nevertheless, the UK will also retain the ability to conduct limited operations on a purely national basis.

Deduction: *Increasingly bespoke multinational coalitions demand that Maritime Forces develop and maintain the capacity to operate with a wide range of partners. Doctrinal cohesion/awareness and training are essential enablers of interoperability, whether with Allies, coalition partners, OGDs or non-state partners, such as NGOs and maritime agencies.*

Deduction: *Analysis should determine the balance of niche and shared capabilities in a future Maritime force structure that provides the greatest leverage and influence over the strategic thinking of the US and other allies.*

Deduction: *The need to conduct UK-only activities requires the maintenance of an irreducible minimum level of national maritime capability, in proportion to our national commitments and assessments of risk.*

119. **Cross-environmental Seams.** The need to integrate Maritime capabilities at all Scales of Effort with an ever-wider range of Joint assets, either in a supported or supporting role, will mean that capabilities traditionally associated with the Maritime environment will increasingly extend their influence across the environmental seams. The seams between the Maritime and other environments will therefore demand ever more careful management to ensure that all activity properly supports the realisation of the desired effects and the reduction of friction in the seams.

***Deduction:** The complex maritime seams associated with the Land and Air environments will require the implementation and development of control mechanisms and procedures to reduce friction and maximise opportunities. Doctrinal and conceptual development will be expressed through seam sub-concepts (such as LitM and Land/Air) and regularly scheduled Joint and Combined exercises.*

International Law and Legitimacy

120. **Legal Complexity.** The maritime operating environment comprises a complex mix of law, practice, custom, agreement and commerce. International law provides a state with almost total legislative control within territorial waters,¹³ but beyond that limit the state's control reduces, but permits economic regulation and ecological oversight out to 200 miles.¹⁴ Further out, the maxim of the freedom of the high seas applies¹⁵ where, other than over its own flagged shipping, a state has a very limited ability to regulate, control or deter other users without wider international sanction and cooperation. Separate legal regimes apply in strategic choke points where coastal states' interests are balanced against freedom of navigation. The result of this complexity is a set of permissions and freedoms that is crucial to the prosperity and security of both the UK and the international community. This dependence is expressed in International agreements and treaties that will increasingly enable legitimate national and international authorities to counter threats, deter would-be transgressors, suppress unlawful acts and exercise control beyond territorial waters.¹⁶ However, this regime may not be sustainable in the face of competing claims to resources and unclaimed space, and in areas where international law remains unclear. In coastal areas, for example, the expansion of urban growth and economic exploitation into the sea will add further to the physical and legal complexity of the littoral.

¹³ In broad terms, a maritime state's national legal jurisdiction extends over its territorial seas out to a maximum of 12 miles from its coast (although the right of innocent passage allows transit through these waters under stipulated conditions). Enforcement of this jurisdiction varies according to the perception of intent and capability.

¹⁴ Beyond 12 miles, a state may claim an Exclusive Economic Zone (EEZ) extending up to 200 miles from its coast; this claim provides rights to explore, exploit, conserve and manage natural resources (living or non-living) although international quotas (fish for example) may bound activity. Other states enjoy certain permissions and freedoms in this space.

¹⁵ The high seas are outside the limits imposed by lawful territorial and economic claims and are hence under no single country's legal jurisdiction.

¹⁶ For example the addition of the 2005 protocols to the Suppression of Unlawful Acts at Sea Convention extend offences such as terrorism and proliferation of Weapons of Mass Destruction (WMD) to the high seas and will give greater legal powers for action.

***Deduction:** The UK's international obligations and political commitment to a growing range of agreements and treaties will require resolve and resource to maintain consensus and enable effective maritime enforcement and cooperative activity.*

121. **Exploiting Maritime Resources.** The exploitation by states and multinational enterprises of mineral, energy and other natural resources in Exclusive Economic Zones (EEZs) and beyond will challenge existing norms of international law, as economic imperatives and competition extend to the exploitation of the deep ocean and to the polar regions. The tension between national interests, global commercial trends and the legal conventions of the high seas is likely to mean increased pressure for physical protection of trade and trade routes, infrastructure, shipping and deep-sea pipelines, as well as protection against environmental degradation or abuse. Consensual conventions established by UNCLOS are likely to be increasingly challenged as the desire and ability to control and exploit the area on and under the high seas grows ever stronger.

***Deduction:** Competition for resources will increasingly cause tension between state interests and international responsibilities in relation to multilateral agreements and is likely to lead to increased and more widespread instability and crisis, particularly in the previously under-exploited deep ocean, polar and littoral areas.*

122. **Ethical Constraints.** Humanitarian pressure by NGOs will continue to influence international perspectives on the legality of certain capabilities and actions, and environmental issues will increasingly impinge on military activity, affecting, particularly, high power sonar systems, weapons, carbon emissions and novel methods of propulsion.

***Deduction:** Media scrutiny and international opinion will influence decisions about discretionary and non-discretionary activities, and will also affect both the capabilities and actions of commanders and shape Rules of Engagement (ROE) at all levels. Training and exercises should reflect and mitigate this possibility.*

***Deduction:** Potential adversaries, particularly non-state or rogue-state adversaries, may not feel bound by the same constraints of public scrutiny and may therefore threaten to use a broad range of highly effective weapon systems and disruptive means.*

***Deduction:** States or groups that do not adhere to international conventions or heed opinion will present a practical problem as well as a military and ethical dilemma.*

PART 2 – THE FUTURE MARITIME ENVIRONMENT

Environmental Context

123. The strategic context indicates that expeditionary maritime forces will normally have to be able to deploy to an area of operations, provide presence, achieve

levels of sea control¹⁷ or denial (in time and space) appropriate to the mission and to project power at sea and onto the land. In an era of globalisation and uncertain risks, this requires a balanced force able to operate on, under and above the sea in littoral¹⁸ areas and in the open ocean. Some assets will be able to operate in, or project power across both of these markedly different areas, but each also has distinct characteristics that require unique techniques and technologies based on both the physical nature of the environment and the character of the threat. Manoeuvre in the oceanic setting, although generally less threatened by surveillance and sea denial assets than the littoral, requires self-sustaining capabilities optimised for range within a less cluttered battlespace. In the littoral, the presence of urbanised areas, offshore activities, and the increased surveillance and area denial options available to an opponent present different challenges. A maritime force will be required to operate across the full range of these environments, possibly simultaneously, conducting different activities in each. However, common to the whole maritime environment is the requirement for extensive definition and analysis in order to achieve a level of resolution of the operating area that exposes operational and tactical opportunities and identifies an acceptable level of risk. Resolution will invariably rely on accumulated, fused all-source i2 available on a continuous basis from strategic intelligence and environmental support, conventional databases, and open-source material, including the media and the Internet. At a tactical level, this degree of resolution will require assets that can provide ‘spotlight’ coverage in addition to the strategic ‘floodlight’.

***Deduction:** Growing emphasis will be placed on influencing and shaping perceptions by the coordinated, focused application of Joint Action through a balance of Joint Influence and the potential or actual use of Joint Fires enabled by Joint Manoeuvre.¹⁹ The availability of appropriately configured capabilities and coordinated actions is likely to be decisive, particularly if executed as part of a wider CA. However, to achieve this efficiently will require a thorough understanding of the strategic context and situation, and of the physical environment in which Maritime forces will operate.*

124. **The Littoral.** With wide variations in topographical, demographic and environmental characteristics, the Littoral regions of the world present diverse challenges to forces seeking to exploit the access afforded by the sea. In particular, the presence of areas of inhabited and urbanised space on land and extending into the sea, adjacent to an often cluttered, busy seascape, with variable resolution of the

¹⁷ The condition that exists when one has freedom of action within an area of the sea for one’s own purpose for a period of time, and if necessary, deny its use to an opponent. Sea control includes the airspace above the surface and the water volume and seabed below. (JDP 0-01.1 ‘United Kingdom Glossary of Joint and Multinational Terms and Definitions’ (7th Edition)).

¹⁸ The littoral is defined in the LitM Concept as ‘those land areas, and their adjacent sea and air space that are predominantly susceptible to engagement and influence from the sea.’ It includes shallow, confined and complex waters close inshore, rivers, over Land and the offshore area.

¹⁹ Joint Action is ‘a framework for the synchronisation of Fires and Influence Activity in a mutually supportive and reinforcing manner that will permit the coherent development of complementary capabilities’. Influence Activity is ‘the capability or perceived capacity to affect the character or behaviour of someone or something’. Fires is ‘the deliberate use of physical means to support the realisation of, primarily, physical effects’. Joint Manoeuvre is ‘coordinated activities necessary to gain advantage within a situation in time and physical or computer-generated space’. (HLOC)

precise features, presents significant challenges for expeditionary forces. Indeed, every littoral situation is different and requires detailed definition and shaping before operations can be undertaken with confidence and at acceptable risk. Inshore operations, particularly those involving combat, significant volumes of ship-to-shore movement and high intensity activity in shallow or confined waters or in the face of even modest sea-denial or irregular threats, are invariably complex, involve appreciable risk and are subject to the vagaries of local conditions. Importantly, indigenous peoples will have a particular knowledge of their own environment and how to best exploit it, especially when deploying sea denial and irregular options. This aspect will confer on them at least an initial advantage and, in some cases, the initiative against opponents who have an imperfect appreciation of local conditions.

***Deduction:** LitM forces realise significant effects by a combination of high levels of agility between the deep field and the inshore area and a lower, distributed footprint ashore. This will expose platforms and assets to detection and attack for the minimum time necessary to achieve tasking. Such mobility also applies to innovative, intelligent exploitation of the prevailing topographical, local activity and environmental features.*

125. **Open Ocean.** Operations in and from the open ocean pose a different set of challenges both now and in the future. Resolution of the operating space is still essential to the successful conduct of operations, but sea denial and sea control, while simpler from the perspective of a less cluttered environment, are also more challenging because of ‘all round’ threats especially in relation to increasingly long-range anti-surface and anti-air missile systems. Some capabilities that can be used to achieve sea denial in shallow waters, and thereby lead an adversary along certain courses of action while preventing others, are not possible in deeper water, mining being a classic example. Certain aspects of threat reduction, particularly against the more covert threat such as the submarine, offer a more complex challenge in the open ocean.

***Deduction:** Within a balanced force, some capabilities are equally effective and relevant across the operating environment, but others must be optimised to reflect particular environmental challenges and threats.*

The Future Maritime Threat²⁰

126. **Character of the Threat.** Potential opponents will have 3 broad choices: to attempt to match our capabilities through conventional mass on mass conflict; to adopt an asymmetric approach and concentrate on a perception that significant impact can be achieved at an acceptable cost and risk, noting that acceptable cost for some opponents will include a preparedness to sacrifice their own lives; or, perhaps most likely, a combination of both. By exploiting irregular as well as conventional attack,

²⁰ Drawn from a number of DIS sources including ‘The Threat to the CVF Platform 2015 - 2025’ dated October 2004, ‘The Global Submarine & Submersible Vessel Threat’ dated 1 November 2004 and ‘Asymmetric Threat Extract’ dated 22 June 2006.

opponents will seek to achieve surprise, destroy cohesion, perhaps through the use of a nuclear device at sea, and so gain decisive advantage. At higher levels of intensity or tension, sea denial or monitoring capabilities will allow regimes and states to oppose access by expeditionary forces or simply to enforce claims to jurisdiction over EEZs or resources in international waters. At all levels, anti-access weapons such as mines, unmanned platforms and Improvised Explosive Devices will be readily employed.

***Deduction:** The UK should retain sufficient depth, resilience and expertise in its conventional capabilities to deal with these challenges. This includes a distinctive ethos, preparedness for war-fighting and a broadly balanced world class conventional combat capability which should remain a distinguishing characteristic of the UK's maritime forces.*

127. **Threat Trends.** Maritime forces, whether at sea, in harbour (at home or deployed) or disembarked ashore, may be observed, threatened or attacked from the air, land or sea by manned or unmanned assets. Many platform-based threats faced in the future will be developments of what is available today and are detailed at Annex A, but maritime forces will also need to be ready to deal with emerging threats from Directed Energy Weapons (DEW) (including energy 'bombs'), Electromagnetic Pulse, more sophisticated forms of electronic warfare, quantum computing, cyber warfare and precision physical attack. Deliberate, accidental or collateral CBRN damage and contamination could pose a particular threat to all Maritime forces including their logistics, supporting, friendly or neutral merchant shipping.

***Deduction:** Protection of the supporting maritime infrastructure from regular or irregular threat (including CBRN risks) will need constant vigilance and should include physical measures, practised procedures and realistic training.*

***Deduction:** New techniques and capabilities will be necessary to locate, out-manoeuvre, deter or defeat threats across the maritime environment. These will need to be optimised for operations in either the littoral or the open ocean, or both as appropriate. To retain a competitive edge, new technologies exploiting modular, re-configurable capabilities, will need to be matched with properly trained, professionally enabled personnel, with varied, adaptable skill sets, who are professionally assured and accomplished in the maritime environment.*

***Deduction:** The defining and shaping phases of an operation are essential to success and SSA is required if opportunities for operational success are to be created and exploited at an acceptable level of risk. This will depend on development of networks, Information Management, Information Exploitation and Information Assurance that are ideally effective across all JIM participants.*

***Deduction:** Military and moral superiority must be maintained even when dealing with agile opponents acting in an unexpected, asymmetric manner.*

Deduction: Collective and individual protection, together with an understanding of the environment will be critical factors in countering the effects of CBRN weapons.

PART 3 – IMPLICATIONS FOR CONCEPTUAL AND CAPABILITY DEVELOPMENT

Future Maritime Forces

128. Future maritime forces will support the Defence Aim by exploiting the access offered by the sea, contributing to the deployment and sustainment the UK's Joint force and sustaining the international system of trade and law. Activities to achieve these fall into 2 main categories - Maritime Force Projection (MFP) and Maritime Security (MS) - enabled by Maritime Manoeuvre. The interdependence of these activities and the agility inherent in maritime platforms and systems will enable task-configured groups to contribute simultaneously to Fires and Influence Activities, in support of the realisation of effects. All will rely on substantial Joint Infrastructure, Joint Battlespace Management²¹ (JtBM) and C4ISTAR (including Intelligence Preparation of the Battlespace (IPB)) assets and integrating technologies. Seamless exploitation will require investment in versatility, capacity and agility for platforms and systems, together with appropriate investment in relevant skills and sufficiently enabled people. This aspect will involve not only realistic through-life training and education, but also a continuing sense of vocation, interesting employment and attractive prospects.

129. In the emerging and medium term, decentralised operations, high technology, increasing weapon accuracy and lethality, networked solutions, the mixing of combatants and non-combatants and urban conflict are likely to be common features of most crises involving maritime forces. UK maritime forces will therefore need to contribute responsive, versatile and sustainable Joint forces that can exert decisive influence, regardless of environment and terrain, through the full spectrum of oceanic and littoral campaigns and operations. In particular, in the early part of the HLOC period, the UK needs to focus on capabilities and technologies that effectively defeat or negate area and denial threats, as well as protecting and sustaining force elements and partners throughout a Joint campaign, both in the littoral seam and in the open ocean. For littoral operations, experience shows that, even in non-combat situations, the urban landscape poses particular challenges in terms of ISTAR, discrimination and the realisation of precise effect. The UK will require new weapons and sensors, while incorporating the lessons of the recent and more distant past, to implement Joint Action and to deny adversaries and irregulars the use of the urban environment.

130. In the longer term, further measures to suit maritime platforms for future operational scenarios will have to be undertaken. Radical and incremental solutions which are offered in emerging technology suggest new answers to traditional

²¹ The adaptive means and measures that enable the dynamic synchronisation of activities. (HLOC)

problems. In particular, innovation in the field of surface ship design may assist survivability and utility, particularly as traditional destroyers, frigates and even minor war vessels look set to migrate to multi-purpose surface combatants. Their use as highly mobile fighting platforms will be typically enhanced by robust (active and passive) self-defence capabilities and the ability to apply capability at sea and ashore. Markedly increased speed, allied to emerging multi-hull technology, signature and profile reduction and air-cushion/wing-in-ground technology, and more varied use of autonomous and semi-autonomous vehicles, would improve survivability, especially against underwater threats, including mines and submarines. Other applications may demand low freeboard displacement or submarine mounting. Redundancy, resistance to advanced directed energy and CBRN applications and more resistant platform protection would also seem to be needed.

131. Long-range, silo and carousel launched, precision, loiter and multi-role systems, optimised for a range of targets, together with emerging energy weapons, appear to point the way ahead for hard-kill and fire projection, linked to networked and unmanned vehicles for attack, cueing and targeting. Emerging concepts and technologies indicate the potential for systems which combine the advantages of indirect fire (long-range and high angle of attack) with the high quality information associated with direct fire weapons. In general, most surface ships are likely to have their systems stowed internally, for stealth and protection, although extensive flight decks will persist for manned and unmanned vehicles. Manned aircraft are predicted to remain widely employable when versatility of action and reaction are required, during low intensity situations and those complex, integrated operations involving decentralised command and decision-making. Elsewhere, where there is no requirement for platforms to be manned, unmanned solutions should be sought, specially for 'dirty, dull, deep and dangerous' employment. Overall, each asset will need to balance its ability to provide tempo, leverage and effect within an overall package of survivability and will have, as a minimum, secure communications and precise navigation.

132. Also, continuing into the longer term, maritime warfare will rely heavily on space based assets. Platforms, ground forces, and 'smart' weapons and munitions will depend on space aided navigation, guidance and targeting, and satellite imagery and communications networks will be vital for providing battlefield knowledge and enhancing command and control. As other nations develop satellite technology and the ability to disable space-based platforms and systems, it will be crucial that the UK retains access to a robust network of space based assets that are redundant and defensible and to a method of disabling hostile assets. The scale of costs, ownership and control of space assets are likely to become issues for cooperative solutions; maritime and Joint capabilities, especially war-fighting, will remain critically dependent on the availability of these resources.

133. **Joint Battlespace Management.** The effective integration of Fires and Influence activity will require improved levels of JtBM if the range and scale of potential MFP options are to be coordinated, especially with Air and Land

capabilities. Self-synchronisation of advanced systems and platforms will be required, but, in all circumstances, modern maritime applications will need SSA, through access to wide area data handling and C4ISTAR systems. This combination should maintain a dynamic, accurate, all source operational picture across all environments, and their associated and often complex seams, supplemented by those organic and supporting tactical assets needed to fill information gaps and extract time critical data.

134. **Maritime Command and Control.** Rationalisation of command and control will be required to match the pace and complexity of modern and future operations and to maintain decision superiority. At one end of the scale will be an all-encompassing multi-sensor and multi-spectral web linked to intelligent processors that will accurately display the entire operational situation. However, to offset the frictional and chaotic nature of crisis and conflict, this aspiration has to be linked to decentralisation of decision-making and the ability of commanders at all levels to take decisive action where opportunities emerge, particularly among the forward/engaged elements.²² This is linked to organisational structures that provide the flexibility and dispersed levels of decision-making needed by the varying operational tempo expected in future conflicts, backed up by the appropriate training, education and information.

135. **Intelligence Preparation of the Battlespace.** IPB is an essential element of the defining and shaping phases of an operation and implies the need for the coordinated, secure collection, processing and dissemination of all forms of i2 in order to achieve SSA and SSU. Effective IPB of potential operating areas will rely on the fusion of all-source²³ data gathered on a continuous basis from strategic intelligence, conventional databases and open-source material, including the media and Internet, and will also involve data relating to unique environmental aspects such as topography, bathymetry and air column analysis. The requirement for these types of data will also be accentuated by the impact of climate change on the oceans. While much of this data will be automated, it will still require personnel with the correct experience and training to assess and analyse its significance. Meanwhile, manned and unmanned national systems and sensors will carry out surveillance, reconnaissance and timely, precise target acquisition in conjunction with multinational and commercial systems in order to produce a coherent and, where possible, fused Joint Operations Picture. Guaranteed and affordable access to space based capabilities is a vital enabler for IPB, through surveillance and targeting, communications (including navigation aids) and transportation,²⁴ but access will require special protection and control of assets if vulnerabilities and dependencies are

²² As typified by the current principles of Mission Command.

²³ Incorporating signals intelligence (SIGINT), communications intelligence (COMINT), electronic intelligence (ELINT) and human intelligence (HUMINT).

²⁴ Exploitation of high altitude techniques and technologies are expected to lead to the development of exo-atmospheric transportation options providing utility for very high speed transportation of people and materiel.

not to be exposed.²⁵ Some redundancy and reversion will have to be retained in view of the existing and emerging anti-space capabilities of potential opponents.²⁶

136. **C4ISTAR.** With timely access to Joint theatre and tactical formation C4ISTAR systems, the network should incorporate manned and unmanned surface, subsurface, space (where allowed by international conventions) and airborne reconnaissance systems dual roled with weapons to enable the force to probe, test, and rapidly exploit opportunities. During force generation, decisions will also be required about which ISTAR functions are organic to a force and which are provided from an asset pool depending on the degree of likely resolution required. In this regard, Information Management, exploitation and analysis, together with sufficient bandwidth, will be critical to achieving appropriate levels of networked C4ISTAR to deliver the necessary SSA and the full range of MFP capabilities. Commanders will also need to be provided with better measures of effectiveness in order to assess effects more accurately and ensure more efficient asset usage. The C2 element of C4ISTAR (together with its enabling bandwidth, will also need to be provided, matched to the level of command being conducted from afloat, and the ability to cope with distributed as well as centralised methods of command. Overall, the future operational requirement suggests that both ISTAR and Fires elements can either be consolidated in single self-contained platforms, deploying a variety of modular, integrated manned and unmanned assets in a local network, or exploited - also in a modular fashion - in a wider network containing a mix of platforms and diverse, cooperative elements, distributed over a wide area.

137. **Force Generation.** A balanced maritime force generation programme will access and enhance Joint capability in conducting activity to realise effects, underpinned by an operationally effective, agile infrastructure. This aspect suggests that the Maritime Industrial Strategy for the build, support, sustainment and disposal of materiel, as well as the necessary training, needs to reflect the effects-based logic throughout. In particular, UK bases, facilities and industries used for generating and supporting appropriate levels of readiness and capability need to retain sufficient physical and systemic resilience, with appropriate redundancy and multiple points of supply if they are to deliver effective, agile force elements. This resilience will be needed to maintain both anticipated levels of routine activity as well as the capacity to surge for contingent operations, with the subsequent regeneration and recuperation requirements. This infrastructure also needs to sustain the moral component of fighting power, including the support of Service personnel and their families.

138. **Logistics.** The operational and logistical restrictions imposed by the sea-land interface bring special challenges in terms of mass, diversity and distribution. Technological solutions will be needed in order to develop weapons, sensor, command and control procedures and vehicles (manned and unmanned) that can facilitate the projection and sustainment of a distributed or concentrated landed force,

²⁵ To be developed further in the next revision of FA&SOC.

²⁶ DSG 05 page 4-1-9 paragraph 33.

across a wide area of the littoral seam. Logistic support will need to match the tempo and operating patterns of these landed forces, which will increasingly comprise smaller, more multi-capable and agile units, usually operating in a distributed or autonomous manner, but networked together. This approach suggests a modular and flexible logistics structure, whose elements would have enhanced levels of reliability, maintainability and, where appropriate, self-sustainability.

Maritime Force Projection

The deliberate employment of military power or influence at sea and against the land in support of the realisation of a range of effects and outcomes in Joint, Combined and Inter-Agency situations.²⁷

139. **Force Packaging.** MFP will be delivered in 2 ways. First, individual units deployed on discrete tasks, will offer forward presence and the capacity to switch quickly to combat and group operations in order to deliver a range of Fires and Influence activities. Second, in more demanding circumstances, units will join dynamically tailored TGs, able to operate singly or simultaneously to provide the sophisticated application of fighting power. These will normally be centred on LitM and CS TGs, configured for the most likely medium and small-scale operations, but with the surge capacity for more demanding, and, in the short and medium term, less frequent large-scale operations. MFP forces will therefore need an inherent, well-developed capability and agility to undertake appropriate activity in all environments, with a range of maritime platforms and systems that can operate with assurance and security in relation to the Land environment when required. For the most demanding scenarios, especially if maritime peer competitors emerge, aircraft carriers, deep-strike aircraft, specialist amphibious shipping and landing forces will need to be complemented by increasingly versatile surface combatants, submarines and rotary wing assets that will provide both interdependent and independent capabilities. They will support, and be supported by, other Components within a JIM context and will increasingly combine with the Diplomatic and Economic instruments of power. An enduring requirement will be the need to ensure that there is enough combat power and agility to realise the necessary effects and levels of air, sea and, if necessary, littoral seam control.

140. **Carrier Strike Task Group.** The CS capability will energise and enhance a wide range of tasks, including those envisaged within the Future Land Operational Concept (FLOC) and Future Air and Space Operational Concept (FA&SOC), and will contribute to operations in most environments,²⁸ while sustaining flying operations on a continuous basis or as dictated by the operational situation. A CS TG, with a tailored Air Group and supporting MFP assets, will enable the delivery of flexible, scaleable expeditionary offensive air power – and other Combat and Combat Support activity - under the least favourable Access, Basing and Overflight (ABO)

²⁷ Future Navy Vision 2006.

²⁸ Temperate, urban, desert and mountain environments, as well as cold and jungle environments – Carrier Strike Policy Baseline dated November 2005.

conditions²⁹ from a highly mobile, well-found sovereign operating base. In its primary role, this will provide deep strike against Time Sensitive Targets (TST) in all environments and the ability to support the Land Component in Close Air Support and Air Defence over land and sea. Additionally, the CS TG will provide an organic air surveillance and airspace coordination capability with utility across the full spectrum of Military Tasks, as well as offering a Forward Aviation Support (FAS) capacity, a secure operating base for Special Forces (SF) and the ability to operate a wide range of attack and support air assets,³⁰ including unmanned vehicles. At the other end of the spectrum, it can provide a secure base, a stable platform and a coordination centre for the provision of humanitarian assistance and disaster relief. Deploying swiftly, it will provide an operational commander with a range of options for conducting precise actions through capabilities that have reach, endurance and tempo, in support of political choices. In conjunction with the Joint Sea Base (JSB), it will make a significant contribution to the air support capabilities required by Joint forces, while the inclusion of an airborne surveillance capability (MASC) will enable the CS TG to undertake a key Force Protection (FP) role, but also support FP and wider CS roles. The CS capability will be further supported and complemented by a range of Joint combat and combat support assets, in particular networked systems, Afloat Support, Air-to-Air Refuelling, Strategic ISTAR, Strategic and Intra-Theatre Air and Sea Lift.

141. **Littoral Manoeuvre Task Group.** A LitM TG will comprise any combination of manoeuvre assets operating in the littoral, but, in its most demanding and most agile role, will have at its core specialist amphibious and auxiliary shipping, and a Landing Force configured to conduct combat operations. Enhancements in lift will be provided by the use of Commercial Chartered Shipping in a suppressed environment or where the level of risk is deemed acceptable. A LitM TG will therefore be able to conduct high impact, low footprint Ship to Objective Manoeuvre (STOM) from Over the Horizon (OTH) through synchronised, simultaneous surface and/or air assault in support of both concentrated and distributed operations. It will also be configured, trained and held at readiness to execute Theatre Entry, including against hostile or potentially hostile shores.³¹ Exploitation of emerging technology and incremental acquisition will progressively extend air and surface assault and support capabilities from further OTH to deeper inland, enabling the establishment and use of an increasing range of Littoral portals³² at lower levels of risk. Technological solutions are needed to enhance the STOM capability of the existing amphibious force and to improve the effectiveness of the MOD-owned reinforcement shipping to complement specialist platforms. This enhanced capability, in conjunction with maritime pre-positioning, might allow mission specific equipment to be available to more than one JOA within a region, thereby enhancing agility, with

²⁹ As defined in DSG 05 Part 2 Section 5.

³⁰ Including Joint and coalition air assets.

³¹ Planning assumptions assume that landings will be lightly opposed. DSG 05 page 4-1-13.

³² A port, airfield or operationally convenient point within the JOA through which force or influence can be applied on a time limited basis. Littoral Manoeuvre Interim sub-Concept dated 27 June 2006.

the potential to lighten the logistic outload for high readiness forces and the footprint ashore. Indeed, the ability to project power at and from the sea in order to realise effects, without necessarily basing forces ashore, is becoming a possibility through technological advances and new operational and organisational Concepts. These will multiply the options for the exploitation of sensor and weapons technology (lethal and non-lethal) to reduce demands upon human resources, platforms and logistic footprint, as well as the potential threat to human life.

142. **Fires.** Fires from maritime units will include offensive and defensive activities to counter conventional and irregular adversaries at sea, and the ability to support and gain secure access to the land. Maritime Fires, projected from manned and unmanned air, surface and subsurface platforms, will include long range precision attack, gun and missile support, prosecution of TSTs, assistance in the suppression of enemy air defences and the provision of close air support to the LitM force and Land Component in the littoral. Matching and networking of all Joint sensors, weapons and platforms to facilitate cross environment activity and effect, across the spectrum of conflict will enhance capability and avoid duplication. In particular, weapons and warheads need to have applications across traditional boundaries, such that weapons are suitable for use across environments and seams. To this end, lethal capabilities will need to include a broad range of precise, decisive (in range and lethality) and reconfigurable (modular) weapons. Non-lethal capabilities at the strategic/operational level will centre on Influence Activity designed to conduct perception shaping, psychological operations, economic sanctions and population control measures. The capability for the elimination of targets and elements of enemy power at a time and place of choice will require improvements in the entire process, from sensing to shooting, and will include rapid, accurate, cheap fires, improved detection, time-sensitive targeting, open access to weapons allocation by tactical operators, fast multi-tasking for weapons allocation and more discretionary weapons with shorter sensor-to-shooter cycles. This will require an improved, multi-tasking weapons allocation system that makes weapons available when and where they are required by Joint Action in the realisation of effects. The platforms hosting this range of Fires will also conduct SF insertion, support and recovery. The implications of DEW and other disruptive systems will need to be considered as technologies that can be weaponised are delivered.

143. **Non-lethal Options.** Influenced by emerging political, economic, and social trends, the requirement for non-lethal weapons and associated operational techniques will expand significantly. Capabilities should therefore include non-lethal solutions in order to project maritime influence and power at sea and ashore, particularly in urban areas and in operations where collateral damage is unacceptable.

144. **Influence Activity.** Maritime forces will undertake a broad range of influence activities in peacetime, crisis and conflict, exploiting the capacity to poise for extended periods in order to exercise leverage across the Strategic, Operational and Tactical levels. They will do this as part of a coordinated Joint Influence campaign that will incorporate other instruments of power across all environments.

The presence of capable, forward deployed and independent maritime units acts as a force for stability and confidence-building to partners and a deterrent to potential foes, as well as means of influencing the Will and Understanding of adversaries and non-aligned decision-makers. During tension and crisis, the presence of a more capable force and indications of political intent has an even more powerful influence effect. Closer alignment of Foreign and Commonwealth Office (FCO), Economic and Defence objectives under a CA and within a coherent national Strategy will allow a more precise identification of effects and a more agile steering of activity to realise them. At the most basic level, Joint Influence will be delivered through a spectrum of activity including port visits, exercises with the air, land and maritime forces of other countries and a wide range of diplomatic and commercial functions, particularly in regions and countries not readily accessible by, or welcoming to, other forces. The traditional attributes of maritime platforms also make them ideal broadcast stations as part of maintaining a narrative, and thus able to support the overall Influence effort, coherent with that required in other Environments.

145. **Joint Sea Basing.**³³ The JSB represents the specific, sustained application of Maritime Manoeuvre through its potential to apply fires and influence both at and from the sea. The employment of a dynamic, integrated and scalable capability, increasingly networked with the Joint Force offers flexibility and precise impact at each level of command, the entire spectrum of military operations, and throughout the different phases of an operation. This includes Maritime Fires through sea launched weapons and strike aircraft,³⁴ land operations in the littoral by amphibious and SF elements; it implies the possibility of reductions in the Joint or landed force footprint ashore including, in certain conditions, a reduced force protection burden. Once sufficient threat reduction has been achieved, Joint Sea-Basing offers significant potential to enable greater operational mobility and tactical agility, while reducing immediate vulnerability. This would also enable the operation of distributed attack and logistic groups and the capacity to support dispersed units using offshore assets. In a more dispersed, dynamic operational space, it is likely that Maritime forces may increasingly be called upon to provide sea-based logistics for Joint forces operating inland, especially for specific commodities such as munitions. Access to appropriate intra-theatre lift and resources, including suitable landing zones and routes, will be needed to enable the sustainment of operational tempo and cover the full range of likely activities, including interfacing with Joint, Allied and coalition partners. Similarly, a reliable, secure logistic coupling bridge and Line of Communication will be essential for successful long-term sustainment of Maritime forces, utilising sea-basing where appropriate. As well as integrated Fires, sea basing should include the widest range of C4ISTAR and Influence capabilities and, crucially, the capacity to move functions in both directions between the sea base and shore as a campaign unfolds and develops.³⁵

³³ 'Use of the sea as a base within Joint operations in order to contribute to an optimum force footprint ashore.' (JDP 0-01.1). The full utility of JSB is described in the endorsed JSB Concept of Operations dated 27 September 2004.

³⁴ Incorporating fixed wing, rotary, manned and unmanned platforms.

³⁵ By using austere and well found ports, Expeditionary Port Infrastructure and innovative intra-theatre lift capabilities.

Maritime Security

*The level of presence, assurance and capability that is required to defend the UK homeland and sovereign territories, at range where necessary: to preserve the free, safe and lawful use of the high seas and to protect Joint, Allied and coalition forces in oceanic and littoral areas*³⁶

146. The ability to mount and support expeditionary operations will involve the enduring protection and integrity of the UK home base and its Overseas Territories, together with an ability to ensure global access through the maintenance of secure SLOC and control of discrete oceanic and littoral areas. Activity will necessarily include the protection of the associated infrastructure, platforms, equipment, personnel and information used by the maritime forces and the safeguarding of non-aligned shipping in the vicinity. It will also demand the ability to influence or act against state and non-state groups and individuals, at the distance from the UK at which they threaten to pose a threat to UK interests, and is inextricably linked to Maritime Manoeuvre and MFP.

147. Maritime Security (Annex B) has 3 interrelated aspects: UK Maritime Security (which is focused purely on the UK mainland and Overseas Territories, including Territorial Waters and Airspace); Maritime Security Operations (MSO) (which deal with the security of the international system);³⁷ and Maritime Protection (which is focused on the physical protection of strategic maritime choke points and the internationally recognised maritime infrastructure). These activities are usually separated in time and space but are, to a significant extent, interdependent. All will require improved inter-agency and international cooperation and the exploitation of increasingly accessible and pervasive communications, C4ISTAR and media coverage to maximise SSA and support Joint Influence. Maritime assets offer wide enforcement options to international or national authorities seeking to deal with those engaged in Irregular Activity, particularly as maritime platforms offer sustained reach and coverage in conjunction with persistent Air assets. Global security challenges and emerging themes indicate that UK participation in Maritime Security tasking is likely to remain a high priority.

Maritime Manoeuvre

*Coordinated activities at sea to apply force, presence or influence in order to gain an advantage in time and physical or computer generated space.*³⁸

148. Maritime Manoeuvre will exploit the sea as a strategic medium, for the protection and promotion of UK interests, and for the demonstration of national intent, independently or in conjunction with Allies. It will enable the delivery and

³⁶ Future Navy Vision 2006.

³⁷ MSO is explored in greater depth in the paper 'Maritime Security Operations-The Military Contribution', MWC 11/2/3/5 dated 5 May 2006.

³⁸ Derived from the definition of Jt Manoeuvre in HLOC and developed in JDN 1/07 'Joint Action' dated February 2007.

application of flexible, scalable maritime capability packages capable of conducting the actions necessary to realise the desired effects across the Joint battlespace. The degree of access and freedom from jurisdictional constraints offered by the High Seas will enable force elements to position strategically, without undue provocation, so the sea can be a manoeuvre space either to allow an approach to an objective (including transit from the port of departure) or to permit unfettered access to an area of operations either at sea or on the land. This characteristic is enhanced by the fact that maritime forces are ready and capable of undertaking the full range of functions from crisis management to combat immediately on arrival, requiring little or no in-theatre build-up or training and without the need for in-place infrastructure or resources. Maritime Manoeuvre will be enhanced by the introduction of vessels capable of higher speeds that will reduce the transit time to and within the theatre of operations.

149. Expeditionary military forces³⁹ will require access to appropriate strategic air and sealift and its supporting operating infrastructure to support the full range and scales of Military Tasks. Sea lift allows the delivery of substantial combat power including larger medium and heavy formations, but will be slower than aircraft (although less so than at present if the capability offered by high speed vessels is exploited) and may require to be supplemented by Commercial Chartered Shipping and by further lift⁴⁰ from Sea Port(s) of Disembarkation (SPOD) to the JOA. The choice of strategic lift will, therefore, depend on operational circumstances and may often require elements of both, as well as land transportation, depending on the nature, direction and location of the deployment. Strategic sea and air lift are reliant on Host-nation Support (HNS) to differing extents although, with the exception in the maritime environment of Amphibious Forces, both typically require access to well found, high volume infrastructure for optimum discharge. Alternative methods of offload from shipping will need to be developed if reliance on HNS (which may be subject to competition for facilities) is to be reduced and tempo increased.

150. Access across and from the sea can, however, mitigate potential ABO constraints. The routine deployment of maritime units and task organised formations with their inherent flexibility, reach provided by organic Afloat Support (AFSUP), and ability to reconfigure rapidly without the need to return to the home base, enables high readiness units to poise close to or within potential operating areas.⁴¹ This will either reduce unwanted political signals or send a very clear message and provide politicians and Commanders with additional options. This characteristic also contributes to operational agility and enables the rapid projection of maritime force, incorporating a range of Theatre Entry, Joint Fires and Influence capabilities, to meet a broad range of anticipated or emerging threats and tasks. Early in a crisis, when HNS and basing or over-flight permission cannot be guaranteed, maritime forces will

³⁹ The policy requirement to adopt an expeditionary strategy was set out in SDR and in the conclusions of the SDR New Chapter. The requirement for the UK to 'extend [its] ability to project force further afield than the SDR envisaged' is clearly articulated in DWP 03 and reinforces this enduring theme.

⁴⁰ Typically by road, rail or air and often by a combination of the 3; the mode will depend on availability and priority.

⁴¹ Commercially chartered shipping can also be poised in or close to a theatre but the characteristic may be constrained by availability, design limitations and contracting arrangements.

be the principal means by which political and diplomatic influence and, if necessary, decisive force can be applied at acceptable levels of risk and without the need for long term commitment or an extended engagement. More broadly, the development of Joint Medium Weight Capability⁴² (JtMWCap) reinforces Maritime utility for delivery, Theatre Entry and sustainment of Land and Joint forces at high readiness for both SS and MS intervention. Matching sea-lift readiness profiles to those of the forces to be lifted and to pre-deployment warning time to load shipping, for pre-positioning or direct transit, will be critical for a credibly agile expeditionary capability.

151. **Supporting Capabilities.** Maritime Manoeuvre will require sufficient air, surface and sub-surface systems and platforms to guarantee an adequate level of sea control and to suppress sea denial capabilities within specific periods of time and areas of space.⁴³ The fundamental recognition that different techniques and technologies need to be applied in littoral and oceanic environments, is a critical factor in determining this balance. Even when supported by capable C4ISTAR assets, finding and fixing conventional maritime forces remains asset intensive and capabilities to provide reliable, accurate SSA are essential, including novel techniques, if risks are to be minimised and opportunities identified. A requirement will continue to survey, and if necessary clear, military and key commercial ports, routes and shipping lanes of maritime threats in order to prevent attempts to inhibit manoeuvre, Theatre Entry and reinforcement (and in the wake of environmental and topographical disaster). Some elements of this effort, such as mine clearance and survey, offer significant potential for unmanned vehicles to accelerate the process, to conduct tasks more covertly and efficiently, and to reduce the risk to other assets and personnel.

CONCLUSION

152. The sea, as the indispensable medium for trade and access to areas of strategic interest, remains vital to the UK's economic vitality and the ability to protect the country and its friends. It will continue to provide critical access for Joint assets particularly, at medium and large scales, allowing influence in support of political objectives, the conduct of a wide range of security and peace support activities and, when necessary, the means to assemble and apply decisive combat power at a time and place of political choice. Maritime forces will continue to support the Defence Aim by exploiting the sea as a strategic medium in providing security for the UK and its partners, preserving international order at sea and in promoting national values and interests in the wider world. As such, future maritime units and TGs will need to be able to conduct activity in support of the realisation of effects in all environments across the spectrum of operations as part of an EBA/CA. Future crises and conflicts

⁴² JtMWCap is an agile, coherent combination of high readiness force elements capable at short notice of exerting influence and realising effect in all Core Regions up to MS. JtMWCap Analytical Paper dated 24 April 2007.

⁴³ Maritime Manoeuvre requires the orchestration of several core capabilities that include AWW, UWW, Environmental Exploitation, Amphibious Warfare, MARS and AFSUP and Maritime C4ISTAR.

will require UK maritime forces to be agile and networked in order to cope with situations characterised by complexity, tempo and unexpected events. This will entail the formation and operation of dynamically configured force packages of personnel and materiel, incorporating increasingly diverse Fires and Influence capabilities and operating at a high tempo to control situations and engage adversaries in depth and, if necessary, from increased range. Therefore, consistent with current and predicted political and geo-strategic imperatives, the UK will continue to provide a maritime expeditionary capability that will allow essential congruence with the US, compatible, complementary operations with our European and other regular partners, and a composite, self-containable, versatile force able to work alone and with less familiar partners.

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ANNEX A – THE FUTURE MARITIME THREAT EXPANDED

A1. **Fast Attack Craft.** The threat posed by manned and unmanned Fast Attack Craft and Fast Inshore Attack Craft (FAC/FIAC) will continue to evolve, particularly for littoral operations. FAC in the conventional sense will progressively benefit from networked operations (particularly targeting), unmanned applications and advances in Anti-Ship Cruise Missile technology and availability. Some groups will be able to conduct swarm and sustained attacks with large numbers of cheap, expendable hulls and people, and small stealthy vessels designed for high impact, irregular attacks will continue to challenge defences and the interpretation of Rules of Engagement (ROE). Future developments are likely to include the use of agile, remote controlled boats, suicide options and submersible vehicles of varying size and payload operable over increasingly extended ranges.

A2. **Improvised Explosive Devices.** Improvised Explosive Devices (IED) operated remotely or in a suicide attack will pose a considerable threat to major platforms, especially when transiting choke points¹ and when in port.² Applications in the Land environment are likely to become more sophisticated and include thermo-baric and other advanced technologies.

A3. **Submarines.** As submarine and submarine launched weapon technology proliferates and introduces new levels of capability, an increasing number of nations will be able to deploy conventional and, in a few cases, nuclear submarines incorporating the latest weapon, sensor and propulsion technology. Mini-submarines and unmanned underwater vehicles will offer state and non-state groups³ simple, low-risk and inexpensive options for irregular and covert surveillance and attack in both the littoral and open oceans, including against economic and prestige targets.

A4. **Mines.** Mines will continue to develop and become even more widely available at sea, where increasingly sophisticated variants could target specific platforms and employ advanced counter-countermeasures, and on land where off-route and anti-helicopter mines have the potential to constrain manoeuvre. They are particularly attractive as an asymmetric option in the littoral, where even primitive

¹ Such as canals, rivers, locks, harbour entrances and straits.

² For example the deployment of an IED against USS COLE in 2001, against UK inshore patrol craft on the Shatt al-Arab waterway November 2006, and against Israeli patrol craft.

³ For example the discovery of a submarine floating off NW Spain in August 2006 and another half-built submarine in Colombia in September 2006 both suspected of being used in drug smuggling. (BBC News website)

mines or a declared mining capability pose a significant sea denial threat to maritime forces, especially for littoral forces and inshore submarine operations.⁴

A5. Land-Based Threats to Offshore Assets. Conventional land formations, deploying artillery, Precision Guided Munitions and rockets/missiles, pose a credible threat to maritime units in the close littoral. Coupled with appropriate sensors, or target designation, the threat will not be limited to the visual horizon and is likely to be extended and coupled with 'smart' terminal applications. Modern surface-to-air missiles have the capacity to detect and engage targets well out to sea and it is likely that these systems will proliferate and extend their reach during the timescale of the Concept.

A6. Sea Based Ballistic and Cruise Missiles. The proliferation of sea-based long-range cruise and ballistic missile systems increases an adversary's ability to hold static formations, facilities and operational areas at risk, possibly in concert with Chemical, Biological, Radiological and Nuclear (CBRN) programmes, as well as posing a threat to ships themselves. This threat to the UK mainland is likely to increase during the life of this Concept.

A7. Aircraft. Technologically advanced or progressively upgraded manned and unmanned attack and surveillance aircraft, together with armed rotorcraft, will become more widely available, often linked to other integrated surveillance and targeting systems. In principle, any long-range aircraft with a rudimentary communications and sensor system could be employed for oceanic surveillance, third party targeting or as a method of attack.

A8. Directed Energy. Directed Energy Weapons (DEW),⁵ currently in their infancy, are developing rapidly and an increasing variety of DEW types is likely to be deployed and used by regular forces - and possibly irregular opponents - within the next 20 years. Incapacitating laser dazzlers are already mature and will be increasingly widely available to both state based and non-state organisations.⁶

A9. Electromagnetic Pulse. Although historically associated with the effects of nuclear explosions, designs for Electromagnetic Pulse (EMP) weapons are readily accessible and offer an asymmetric option against an adversary highly dependent on information systems, networked computers, integrated communications and computer controlled systems such as weapons, sensors and control systems. While specific

⁴ Mining of the Red Sea in 1984, the Gulf of Oman and Persian Gulf in 1987 and the approaches to Kuwait in 1991 provide pertinent examples. Even allegations that mines have been deployed (whether true or false) can cause significant disruption and may occupy considerable resource to substantiate and/or neutralise the threat.

⁵ A DEW is a type of energy weapon that directs energy in a particular direction by a means other than a projectile. It transfers energy to a target for a desired effect. Broadly defined, DEWs can be categorised according to the type of energy used (sound, radio, light, particles, plasma, etc) and the intended effects on the target (physical damage, interference with senses and guidance, disorientation, disabling machinery, incapacitating people, etc).

⁶ For example DEWs marketed by Ionatron advocate their use by organisations such as commercial security firms, energy facility security forces and port authorities. Information available from: www.ionatron.com

military operational systems can be hardened against EMP, broadening use of commercial off the shelf equipment and secondary and administration systems brings increased vulnerability.⁷

A10. **Unmanned Vehicles.** Unmanned Vehicles⁸ will provide inexpensive, low risk and non-attributable alternatives for Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR), weapon delivery and attack on, under and above the sea.

A11. **CBRN and Irregular Challenges.** CBRN capabilities potentially pose a set of constraints that make them a unique category of threat, which must be classified and tracked from manufacture to launch. Neutralisation will have to include minimising their impact, either through containment prior to impact, suppression of its effects or complete annihilation of weapons. CBRN trained personnel, defence mechanisms and techniques will need to counter and mitigate the diversity and lethality of opposing capabilities, in theatre, while deployed and possibly at home. Improved and more sophisticated seaward defence arrangements may be required to combat irregular activity including conventional and non-conventional terrorism, infrastructure sabotage and direct attack.

⁷ For example systems and infrastructure controlling critical functions such as power distribution networks or air traffic control.

⁸ Including armed and unarmed Unmanned Vehicle (UV) derivatives such as Unmanned Combat Air Vehicles (UCAV) and Miniature Unmanned Aerial Vehicles (MUAV), unmanned submersibles and unmanned FAC/FIAC.

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ANNEX B – MARITIME SECURITY

B1. Introduction. In discharging its national responsibilities and international obligations, the UK is committed to the provision of security in the territorial seas of the UK mainland and its Overseas Territories, together with their associated airspace and resources. In addition, in international waters, the UK provides protection to national and entitled shipping, safeguards national interests and contributes, in conjunction with allied and other partners, to international order and security. This wider activity includes the Suppression of Unlawful Acts, such as piracy and slavery, the Proliferation Security Initiative and the maintenance of the UN Convention on the Law of the Sea (UNCLOS) regime.

B2. UK Maritime Security. The protection of the UK mainland, its Territorial Waters and Airspace is a prime responsibility for HM Government in discharging the responsibilities of a sovereign power. In the short-to-medium term, the predominant threat to the UK mainland will be from Irregular Activity; this will be countered by a Comprehensive Approach (CA) in which primacy of responsibility rests with the civil authorities led by the Home Office. The military role is to provide assistance to the civil authorities in times of emergency or when specialised capabilities are required in coordination with, and in support to, Other Government Department (OGD). Routine maritime security tasks include the protection of UK interests in the surrounding seas, assisting civil authorities in maritime surveillance, fishery protection, maintaining free access to critical ports and coastal infrastructure and deterrence of terrorist, criminal and other illicit or harmful Activity. The Maritime contribution also includes the provision of Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) capabilities not available to civil powers,¹ together with platforms, personnel, techniques, tactics and procedures for the interception and interdiction of maritime threats. Maritime forces will continue to have particular utility, such as port and route survey, countering renegade shipping and Maritime Counter Terrorism (MCT)² and the provision of sophisticated command and control facilities. Improved network integration (CIS and human) will be essential to achieving the greater information sharing with other intelligence and enforcement agencies,³ especially in exploiting and supporting the Intelligence and Information (i2), surveillance and reconnaissance capacity of dispersed maritime platforms engaged in distributed operations. Greater networking and implementation of a CA will facilitate proactive Military Aid to Civil Authorities (MACA), enhance the operational capacity to support maritime

¹ Including the wide-area ISTAR and coordination functions offered by Maritime Patrol Aircraft and Unmanned Aerial Vehicles (UAVs).

² DWP 03 and supporting essays.

³ Around the UK, Transport Security (TRANSEC) maintains a plot of vessels as they enter and leave UK ports, complemented by a Lloyds database of trading activity. Her Majesty's Revenue and Customs (HMR&C) collate information through surveillance and recording by cutters and Islander Aircraft.

constabulary activity⁴ and strengthen the ability to combat organised crime. Better coordination and the overt demonstration of capability will deter and counter irregular threats and attacks, as well as mitigating their effects.

B3. Maritime Security Operations. The principal objectives of Maritime Security Operations (MSO), coordinated with OGD and international partners, are to deter and prevent illegal acts, contribute to the provision of a safe maritime environment, and hence reduce the threat of harm to the UK by dealing with risks at range from the UK. The inherent flexibility and reach of maritime platforms allow sustainable presence and the extension of security activity beyond UK waters, particularly where regional engagement has established a basis for the improvement of local interception and interdiction capabilities.⁵ The light physical and political footprint of maritime forces makes their employment highly attractive, while their inherent flexibility enables them to be scaled according to the prevailing assessment or perception of the threat. While MSO activities are a reasonable and consistent response to the current and emerging threat posed by Global Counter Terrorism (GCT), they also support the UK's international obligation to take action against a growing range of illegal activity on the high seas, including illicit traffic, piracy and economic adventurism and encroachment. They allow the possibility of intervention into the littoral for GCT and facilitate capacity building. This sort of activity can be accommodated within routine deployment cycles aimed at fostering regional understanding and stability, ranging from low level tactical discussions and demonstrations to advanced Joint and combined training exercises. It needs to be recognised that MSO activities are a central part of achieving resolution of an operating area in support of a CA, and international and local cooperation will be essential in gaining an accurate Shared Situational Awareness (SSA).⁶ This aspect needs to be associated with multi-national conceptual and doctrinal innovation, and it should be considered that some MSO partners will not be states or organisations with whom other maritime activity is routinely conducted. Furthermore, effective inter-agency and international cooperation in Maritime Security need to be routinely exercised and practised in order to exploit the full potential of an integrated and Effects-based Approach (EBA).

B4. Maritime Protection. Increased perceived and actual threats to Sea Lines of Communication (SLOCs) will require constant vigilance and dedicated protection for essential infrastructure, ports and anchorages and shipping cargoes. Most of the world's trade, by bulk (particularly energy), will continue to transit sea areas adjacent to unstable countries and through choke points such as the Suez and Panama Canals

⁴ Broadly defined as the use of maritime military force to uphold national or international law, mandate or regime in a manner in which only minimum violence is used in enforcement. BR 1806 *British Maritime Doctrine* (3rd Edition).

⁵ For example, the conduct of counter terrorism patrols in the eastern Mediterranean under the auspices of NATO's Operation 'Active Endeavour'.

⁶ Such an approach is gaining increasing support and is inherent in Admiral Mullen's (Chief of Naval Operations (CNO), United States Navy) concept of a 'Thousand Ship Navy'.

and the Straits of Hormuz and the Malacca straits. Conflicts in the Middle East and Gulf have shown the potential for interdiction by criminals, irregulars and states to exploit the fragility of international markets and to affect the economic vitality of developed states. Expeditionary operations undertaken by sea will tend to follow the same routes and will need protection appropriate to the time, intensity and location of possible risks and threats demand. On occasions, freedom of navigation and Maritime Trade operations (MTO) may be instigated to maintain the integrity of specific trade routes and to safeguard the uninterrupted flow of vital strategic materials and energy, as well as the trade on which prosperity relies. This activity requires regular exercise and practice, to enhance coordination and provide an effective interface between military commanders and merchant vessel owners and operators in order to maximise the potential for effective deterrence and security.

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