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# Current aspirational concepts such as force transformation, effects based operations and network centric warfare and their relationship with the classical maritime theories such as sea control and sea denial

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*It is incomprehensible that the whole naval force of each side should have gathered against the other again and again and simply fought for the mastery [of the sea], unless something was to follow when it was gained<sup>1</sup>*

Admiral Philip Colomb, Royal Navy (1899)

*[Command of the sea] never has been and never can be, the end in itself. Yet, obvious as this is, it is constantly lost sight of ... we come unconsciously to assume that the defeat of the enemy's fleets solves all problems<sup>2</sup>*

Sir Julian Corbett (1907)

In the quotes above, both Admiral Colomb and Sir Julian Corbett set out clearly that command of the sea is the *way* to an *end*, not an *end* in itself. The *ends* are those circumstances for which a nation wants to use the sea for, which can also include preventing an adversary from using the sea for his purposes. Achieving command of the sea is the essential concern of maritime strategy, and the *ways* of achieving that command, specifically *sea control* and *sea denial*, have been at the heart of maritime theory for over a century. However, over the past decade we have seen a succession of new 'aspirational' concepts, many technologically based, which have been competing for attention in military and maritime strategy. Concepts such as *Force Transformation*, *Network Centric Warfare* and *Effects Based Operations* have been influencing maritime operations, perhaps pushing aside the classical theories. Experienced authors constantly warn us that these concepts, particularly the technologically based ones, should not become *ends* in themselves, so where do they fit? Are they the new *ways* or *means* to achieve command of the sea? What about the classical concepts of sea control and sea denial—where do they fit now?

Understandably, this onslaught of concepts can leave us puzzling how the pieces—old and new—fit together, or if indeed they can fit together at all. Moreover, it leaves us to question whether these are indeed new, or simply re-badged classical concepts, enhanced by technological enablers. Only by reflecting upon these dilemmas can we determine their relationship to classical maritime strategy.

This paper examines how current military aspirational concepts relate to classical maritime theories. These military aspirational concepts include Force Transformation, Network Centric Warfare (NCW) and Effects Based Operations (EBO).

As the essence of this paper is the **relationship** between aspirational concepts and maritime theories, the framework for the analysis will be based upon on the classical relationship of *ends*, *ways* and *means*. Firstly, the paper explains the methodology and how the classic theories and aspirational concepts relate through *ends-ways-means*. Then the paper examines the essential features of maritime

theories (as *ways*), before looking at Force Transformation and NCW (as *means*), and finally EBO (as *ends*), while relating them to maritime strategy and the classical theories.

### The *Ends-Ways-Means* relationship

Before delving into the detail of technology, strategy and concepts, it is important to understand first the way in which the framework will be applied. *Ends-ways-means* is a relatively simple relationship that is used everyday to understand the influence of objects or concepts upon each other. In this framework, *ends* are the objective; *ways* are the forms through which a strategy is pursued; and *means* are the resources used to achieve them.<sup>3</sup> This paper will go further in the subsequent sections to explain each of these inputs to the relationship, but a broad treatment will set the scene first.

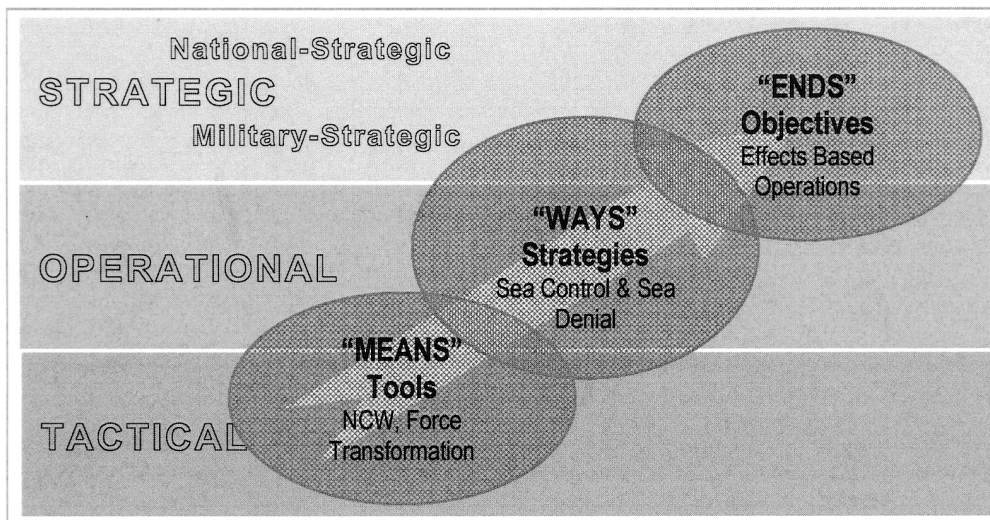
Colomb and Corbett's quotes at the start of this paper make it clear that for at least a century there has been implicit understanding of the need for an objective, or *ends* to military operations. Indeed, successful leaders throughout history have always thought more in terms of achieving effects on the adversary than of destroying him.<sup>4</sup> The key is that any action taken should have a purpose '... something to follow when it was gained' to quote Colomb again. Ultimately the *ends* should 'effect' the adversary so that he is dissuaded from pursuing a particular course of action. At the operational level, this can include destruction of his military forces, but it can also include psychological effects on his strategy makers and national political apparatus. This is the vital point of Clausewitz's dictum regarding war as a continuation of policy by other means.

Somewhat proving that there are no new ideas in strategy, this historic objective to effect the adversary is articulated today in EBO. This effects-based concept is recasting planning at the national-strategic, military-strategic and operational levels. EBO is about focusing on achieving an effect on an adversary, before considering the capability that will be levered to achieve that effect. It relies upon information to achieve greater knowledge of an adversary and his vulnerability—military, political, psychological. However, what of the *means* to achieve these *ends* or effects, and how are these changing in the modern era?

In maritime strategy, ships and their crews are the classic expression of the *means* to achieve the *ends*. However, to these traditional *means* can be added all the military capabilities that have arrived since the start of the 20th century—submarines, mines, aircraft, precision guided munitions, instant communications—plus current aspirational concepts such as Force Transformation and technologically-enabled NCW. These are the tools available for operations, and their value derives from how they are applied to achieve the *ends*. EBO provides such an application, but what is the mechanism to bring the *means* and *ends* together?

This is where the challenge of examining the relationship between aspirational concepts and classical maritime theories begins. Most modern techno-centric analysis seems to focus on a direct link between the *means* of NCW (in particular) and the *ends* of EBO. However, similarly the classical analysis of Colomb and Corbett talk about the purpose of the command of the sea (encompassing sea control and sea denial) to achieve the *ends* also, which is also reflected today in EBO. The analysis framework in this paper proposes that the classical maritime theories provide the necessary strategy link, or *ways*, through which *means* and *ends* meet, across the tactical, operational and strategic spectrum, illustrated in Figure 1.

Without this link, there is the risk that in generating technological capabilities, we may lose sight of the enduring maritime strategies upon which attainment of our objectives are best achieved. For



**Figure 1: The Means-Ways-Ends Relationship**

instance, in 2001 US military ground forces were propelled from the sea into land-locked Afghanistan in Operation *Enduring Freedom*. The strategic *end* or effect was to destroy the rear area and support for terrorist networks. The operational *means* were the aircraft, troops and weapons projected from the ships at sea. However, if sea control had been challenged around those ships, the security needed for the *means* to achieve the *ends* would have been negatively impacted. Indeed, primitive weapons such as mines or low technology asymmetric threats such as speedboats loaded with explosives could have seriously challenged sea control. Thus, the classical maritime theories for command of the sea continue to apply as the link between capabilities and effects, or *means* and *ends*.

**The strategy Ways – achieving Command of the Sea**

To understand further how classical maritime theories are the *ways* and links between the current aspirational concepts, the essential concepts related to command of the sea need to be examined. Since the days when Colomb and Corbett penned the quotes above, achieving the absolute possession required by *command of the sea* has been eroded by the march of modern technology.<sup>5</sup> Indeed, during WWI Corbett recognised that technological innovations such as the mine, torpedo and submarine, made such absolute possession of the sea difficult, if not unattainable. He argued as early as 1911 that it was not *possession* of the sea that was of importance, but the *use* of the sea for movement of own forces that is the centre of maritime strategy.<sup>6</sup>

Today, absolute command of the air, sea surface, water column, seabed and electromagnetic spectrum is further off than ever before. Consequently, the temporal and relative concepts of sea control and its corollary, sea denial, were developed as more realistic strategic *ways*.<sup>7</sup> The terms sea control and sea denial can be used to define both *conditions* that can be achieved, and *tasks* that can be conducted by maritime forces. The condition of sea control exists when one has freedom of action to use a maritime area for one’s own purposes for a period, and, if required, deny its use to an adversary.

The condition of sea denial exists when one's adversary is denied the ability to use a maritime area for his own purposes for a period of time, without being able to exercise sea control oneself.<sup>8</sup>

Sea control can be achieved at the operational level of war by *decisive battle*, or by the operational alternatives to battle: through use of a *fleet-in-being* approach and *blockade*. Decisive battle is where an adversary's maritime forces are destroyed for strategic consequences, so conferring the ability to use the sea decisively and preventing the enemy from doing the same.<sup>9</sup> Decisive battles have been relatively rare in the past and unlikely in the future with the strategic decline of state-on-state conflict. However, even a small-scale engagement, with the turning-back of an adversary's force could be decisive. Similarly, engagements could be decisive where the result is the denial of access to straits or important sea routes.<sup>10</sup> Conversely, a *fleet-in-being* approach is where an inferior force reduces the strategic value of a superior force by frustrating that force's ability to exercise sea control by using harassment and avoiding decisive battle.<sup>11</sup> Technology can be a serious enabler for the inferior force. Alternatively, the military blockade is where a force seeks to prevent the adversary interfering in a substantial way with the blockading force's capacity to use the sea as it wishes.<sup>12</sup> Blockading a port is an obvious example, but choke point operations are also a form of blockade. Aside from using ships, blockade can also be conducted using mines or submarines—again, technological enablers that can benefit smaller forces.

The reward for establishing sea control and/or sea denial is the capacity to use the sea for a country's own strategic *ends*, and deny its use to an adversary. Specifically, in maritime strategy this is articulated as *power projection* ashore and permitting the use of *sea lines of communication* (SLOCs) by military, commercial and private shipping.<sup>13</sup> Practical ways in which countries use the control they obtain include: asserting freedom of navigation rights; protecting the coast and offshore resources; moving and supporting troops; and maintaining local air and sea control in support of air and ground operations that influence events on the land.<sup>14</sup> From the examples it can be seen that sea control has application not only in conflict, but also in peacetime and crisis, to achieve specific *ends*.

Since the end of the Cold War, increasing strategic uncertainty and the decline in traditional threats has seen maritime forces shifting from warfighting and the requirement for classic blue-water sea control. The shift has been toward power projection in the littoral and support for expeditionary operations in response to crises and 'small' wars.<sup>15</sup> However, control of the sea, no matter if limited by time and space, is still a fundamental underpinning condition for power projection operations. Additionally, maritime forces are being used increasingly in constabulary and diplomatic tasks that protect and further strategic national interests. Essentially, the effects a country is trying to achieve with their maritime forces are changing.

To summarise, the classical theories of sea control and sea denial provide the underpinning purpose and conditions for maritime operations. However, the effort of achieving control, by itself, is meaningless unless that control has an effect.<sup>16</sup> Importantly, the need to gain sea control has changed little over the centuries, and the need for it will remain into the future, especially in support of power projection operations. However, the *ends* for which control is sought is changing with strategic uncertainty and new demands. Similarly, while ships, sailors and logistics are the most obvious *means* to gain control, technological developments have been bringing new tools to enable achievement of the *ways* and ultimately, the *ends*.<sup>17</sup>

## The resource *Means* – Force Transformation and Network Centric Warfare

In the last decade, the ability of maritime forces to project power ashore from the littoral has become a strategic task of increasing importance. In response to this and other evolving strategic tasks, maritime forces have been undergoing what has become known as a Force Transformation. The drivers for Force Transformation were initially trying to take advantage of new information technology advances, now embodied in NCW. However, Force Transformation has also increasingly aimed at achieving *balanced fleets* that can meet evolving strategic tasks in peacetime and crisis. The aim is to have a range of balanced capabilities, including mine warfare, force protection and surveillance, which can meet conventional and asymmetric threats in the maritime environment, and so gain and maintain sea control.<sup>18</sup> However, it is information management through NCW that has become the identified goal of transformation for most maritime forces, for it provides the competitive modern tools or *means* to achieve the *ends*.<sup>19</sup>

The idea that information is important for maritime operations is not new; ships at sea have been sharing a common picture over wide distances for hundreds of years. Indeed, NCW was what the Admiral Sir John Jellicoe of the Royal Navy was trying to achieve at the Battle of Jutland in 1916. The ‘Grand Fleet Battle Orders’ system of centralised command was intended to coordinate fleet fire, and thus apply maximum effect upon the enemy. To achieve this coordination, the system relied upon the speed and accuracy of the signal communication system. However, when the signal system (‘network’) failed, it undermined coordinated (‘centric’) fleet tactics and fire control (‘warfare’).<sup>20</sup> The important point to note is that information sharing in networks is not new. However, the way in which technology is being used as *means* to achieve the right *ends* is new.<sup>21</sup>

There has been much written about NCW, and most of the focus has been on the exploitation of technological advances in sensor systems, data processing, communications and precision-guided munitions (PGMs). In principle, NCW is more than just technology. It aims to combine doctrine, training and technology to manage information more effectively. The principle tenet is that networking improves information sharing, which enhances shared situational awareness, which in turn enhances the speed of command and ultimately increases mission effectiveness to achieve the effect ordered.<sup>22</sup> Looking to history again, one author credits part of Nelson’s success at the 1805 Battle of Trafalgar to NCW. Apparently, Nelson’s NCW was not about swift information exchange, but about shared understanding or ‘cerebral networking’.<sup>23</sup> Over years of combat operations, a network of shared understanding had been developed between Nelson and his commanders. Thus at Trafalgar, Nelson was confident that all of his commanders would perceive the developing situation (‘information’) in the same way, and thus would have shared situational awareness. Furthermore, Nelson was equally confident that his commanders understood his intent, and so, without further direction, would exploit weaknesses in the enemy line and conduct mutually supportive actions.<sup>24</sup> This is a classic example that reminds us that NCW is about more than technology; it is about understanding and decision-making.

Ultimately it is not just about having information or a transformed, balanced maritime force, but having the circumstances to do something useful about it in pursuit of the *ends*.<sup>25</sup> The link between the *means* and the *ends* is guided by maritime strategy. For instance, networking of dispersed maritime forces can be of great benefit as a *means* to enable sea control or sea denial in complex littoral environments. Similarly, the technology of weapons and platforms such as submarines, can be a serious enabler for an inferior force who is aiming to achieve its strategic *ends* through blockade or fleet-in-being strategies. Finally, while the classical maritime theories may be modified by such technological development, they will not be fundamentally altered.<sup>26</sup>

In summary, maritime strategic theories are the circumstances through which NCW and Force Transformation assist in achieving the objective required. In terms of NCW, the relationship is well-summarised by Admiral Cebrowski, the ‘father’ of US Force Transformation and NCW:

Network-centric warfare offers the *means* to support the strategy to attain national objectives. It is applicable at all levels of warfare, and it is transparent to mission, force size and composition, and geography. This transparency underscores and confirms NCW as a *means*. In contrast, *ways* or *strategies* must be intimately involved with mission, force size and composition, and geography.<sup>27</sup>

### The objective *Ends* – Effects Based Operations

In the first section of this paper, the necessity of the *ends* or objective of any military operation were highlighted through Colomb and Corbett’s quotes, and the concept of EBO was introduced as the modern articulation of these objectives. EBO is spearheading a shift from the capability-led, attritionist-based planning of the 20th century, to effects-led planning. Information tools, such as NCW, are lynchpins in EBO for they not only provide greater knowledge of an adversary and his vulnerabilities, but also enable rapid information dissemination and collaboration. This results in a better appreciation on how best to dissuade an adversary from a course of action.

Destruction and attrition of the adversary is no longer the only way of achieving the *ends*. Effects can be physical or psychological, and exist at either the operational, military-strategic or the national-strategic levels, and can be applied in peace, crisis and war. For instance, psychological effects at the national-strategic level may only involve the threat of military force, and rely on diplomacy, economic sanctions or support for economic and political reform.<sup>28</sup> An operational physical effect could range from annihilation to attrition, containment or denial of an adversary’s military forces or commercial means (such as shipping or infrastructure). Similarly, an operational psychological effect could be achieved by using military forces for coercion, deterrence, manipulation or punishment of an adversary’s political will.<sup>29</sup> In all cases, through EBO, *ends* are clearly identified before capability *means* or operational *ways* are determined.

Without clear guidance of the *ends* to be achieved, then there can be no clear understanding of what success is, at any level—whether at the strategic, operational or tactical level, and whether in conflict, peace or crisis.<sup>30</sup> Indeed, a successful political or strategic effect may not require tactical success. Recalling the Battle of Jutland in 1916, while a tactical disappointment for the British, they succeeded in stopping the German fleet from destroying the British commercial blockade and thus seizing the initiative in the North Sea.<sup>31</sup> This had far wider strategic and operational consequences, and the *ends* achieved were thus successful in the longer term.

The important implication of EBO for maritime operations is that while the *ways* may not alter, the *means* to achieve them will be adapted as demanded by the *end*. This is not a new concept, and to quote Admiral Sir Herbert Richmond from 1946: ‘Command of the sea is the indispensable basis of security and whether the instrument which exercises that command swims, floats or flies is a mere matter of detail.’<sup>32</sup> An historical example that illustrates this is the Turkish domination of the Dardanelles in March 1915.<sup>33</sup> Effectively, sea denial was executed by artillery *means* ashore to achieve the national-strategic *ends* of denying the Allied reinforcement of the Russians. Today, there are additional technological *means* to achieve these wartime operational objectives: submarine attack, missiles, mines and air attack. The technology may have changed, but the *ways* and *ends* have not.

In summary, the *means* that can be used to achieve EBO *ends* are changing with weapons technology and NCW advances. However, the *ways* in maritime operations have endured for at least a century, and are independent of any particular *means*.

## Conclusion

Turning back now to the initial questions posed—where do these concepts and theory fit? The *ends-ways-means* framework provides a simple way to relate the modern to the classical. It starts by correctly identifying the effect or *ends* of a campaign, before capability *means* or operational *ways* are determined. Next, the *ways* define how a strategy is implemented to achieve the *ends*. Finally, the *means* are the resources needed to achieve the *ways* that achieve the *ends*.

Throughout history, fighting decisive battles or blockading an adversary were the ways in which command of the sea was achieved, and thus the *ends* pursued. Over the last century, absolute command of the sea has given way to the more practical conditions of sea control and sea denial. The aim is to ensure that a nation can use the sea for its own purposes, by either interfering with an adversary's control or preventing them from interfering. Whatever the condition, such control is the *ways* to an *ends* – not an end in itself.

The *means* by which *ways* achieve *ends* have also been changing over the last century, and particularly in the last decade. Force Transformation concepts grew in response to the shifting strategic circumstances after the Cold War. Increasingly, the roles of maritime forces are moving beyond the blue-water and SLOC protection, and into littoral power projection and expeditionary operations. Fleets are being 'balanced' so that they can conduct and support operations in conflict, peace and crisis, and take-up greater diplomatic and constabulary roles. Enabling this transformation have been rapid improvements in information technology, particularly in the concept of NCW. By sensing and sharing information more widely and more rapidly and accurately, the decision making and situational awareness of maritime forces is growing. Networking of dispersed forces in a complex littoral environment is improving the ability of a maritime force to gain and maintain sea control, and thus the *ways* to the *ends*.

Proving perhaps that there are no new ideas in strategy, the implicit understanding that *means* and *ways* need an objective, or *ends*, is embodied in the modern concept of EBO. The effect, whether physical or psychological, must be decided before the tools or the strategies are determined.

Interestingly, the underpinning concepts of NCW and EBO existed, in practice, well before the last decade. Examples at the Battle of Jutland in 1916 and the Battle of Trafalgar in 1805 are cases in point. In the end, while technology is changing the *means*, and there is new terminology and concepts for the *ends*, the classical theories related to the command of the sea continue to provide the *ways* to link maritime operations.

## Endnotes

1. Admiral P. Colomb, *Naval Warfare*, 1899, quoted in Geoffrey Till, *Seapower: A Guide for the Twenty-First Century*, Frank Cass, London, 2004, p. 148.
2. Julian Corbett, *England in the Seven Years War*, 1907 quoted in Till, *ibid.*
3. This concept for this framework is based upon one used by Alan Stephens in his work on effects-based operations (EBO) strategy, and also articulated by the Royal Navy in *BR1806 British Maritime Doctrine*. Of note, the Royal Navy EBO philosophy regards *effects* as the outcome from *ends-ways-means*: ‘the selection of the Ends (the objectives), the Ways (the options), and the Means (the capabilities) ... collectively determine the Effect that is to be delivered’. However, for this paper, both *effects* and *objectives* will be considered collectively as *ends*. Alan Stephens, *The End of Strategy: Effects-Based Operations*, Strategic and Defence Studies Centre Working Paper No. 383, Australian National University, Canberra, 2003, p. 1. Ministry of Defence *BR 1806 British Maritime Doctrine*, Third Edition, The Stationery Office, 2004, pp. 203–204.
4. Gene Myers, ‘Effects-based Operations: Everything Old is New Again’, *Armed Forces Journal*, Vol. 140, No. 11, June 2003, p. 47.
5. *Command of the sea* is defined as ‘the ability to use the sea in its entirety for one’s own purposes at any time and to deny its use to an adversary’. Although valid in a theoretical sense, it is almost unattainable in a practical sense as it relies upon the complete destruction or neutralisation of the adversary’s forces. Commonwealth of Australia, *Australian Maritime Doctrine*, RAN Doctrine 1 - 2000, First Edition, RAN Sea Power Centre, Defence Publishing Service, Canberra, 2000, p. 144.
6. Commonwealth of Australia, *Australian Maritime Doctrine*, p. 38. Julian Corbett, *Some Principles of Maritime Strategy*, Longmans, Green and Co. London, 1911 reprinted by AMS Press, New York, 1972, pp. 87–90.
7. J.R. Hill, *Maritime Strategy for Medium Powers*, Croom Helm, London, 1986, p. 81. Commonwealth of Australia, *Australian Maritime Doctrine*, p. 38. Commonwealth of Australia, *The Navy Contribution to Australian Maritime Operations*, RAN Doctrine 2, First Edition, Sea Power Centre – Australia, Defence Publishing Service, Canberra, 2005, p. 252.
8. Sea denial can be either *defensive* or *offensive*. Defensive sea denial includes prevention of an adversaries power projection through maritime strike and defensive mining. Offensive sea denial includes shipping interdiction and offensive mining campaigns.
9. Geoffrey Till contends that the following characteristics are critical in achieving decisive battle in the modern era: operational level concentration, having an accurate tactical picture, effective command and control, tactical concentration, tactical manoeuvre, logistic efficiency, effective exploitation of the environment, weaponry, resilience and fighting spirit. Geoffrey Till, *Maritime Strategy and the Nuclear Age*, 2nd Edition, MacMillan Press, London, 1982, p. 91. Till, *Seapower: A Guide for the Twenty-First Century*, pp. 173–177.
10. Jack McCaffrie, *Maritime Strategy into the Twenty-first Century: Issues for Regional Navies*, Strategic and Defence Studies Centre Working Paper No. 297, Australian National University, Canberra, 1996, p. 8.
11. Till, *Maritime Strategy and the Nuclear Age*, p. 111.
12. Till, *Seapower: A Guide for the Twenty-First Century*, p. 186.
13. *ibid.*, p. 193. Commonwealth of Australia, *The Navy Contribution to Australian Maritime Operations*, p. 7.
14. John Hattendorf ‘What is a Maritime Strategy?’ in David Stevens (ed.), *In Search of a Maritime Strategy: The Maritime Element in Australian Defence Planning since 1901*, Canberra Papers on Strategy and Defence No. 119, Strategic and Defence Studies Centre, Australian National University, Canberra, 1997, p. 15.
15. James Goldrick, ‘The Medium Power Navy in the 21st Century’, *Journal of the Australian Naval Institute*, Vol. 26, No. 4, Summer 2000–2001, pp. 23–24. Mike Lawrence Smith, Matthew R.H. Uttley, ‘Tradition and Innovation in Maritime Thinking’ in Andrew Dorman, Mike Lawrence Smith and Matthew R.H. Uttley (eds.), *The Changing Face of Maritime Power*, MacMillan Press, 1999, p. 3.
16. Hattendorf, ‘What is a Maritime Strategy?’, p. 14.
17. McCaffrie, *Maritime Strategy into the Twenty-first Century: Issues for Regional Navies*, p. 6.



18. Goldrick, 'The Medium Power Navy in the 21st Century', pp. 23–24.
19. John Luddy, *The Challenge and Promise of Network-Centric Warfare*, Lexington Institute, Arlington, 2005, p. 2.
20. Jutland was a tactically disappointing battle for the Royal Navy, owed, in part, to the undermining of the signal efficiency (the 'network' means) by 'a combination of lost aerials, vibration, gun and funnel smoke, defective message writing and poor visibility'. Till, *Maritime Strategy and the Nuclear Age*, p. 109. Till, *Seapower: A Guide for the Twenty-First Century*, p. 134, 175. Geoffrey Till (ed.), *Seapower at the Millennium*, Royal Naval Museum Publications, Sutton Publishing, Stroud, 2001, p. 18.
21. Commonwealth of Australia, *ADDP-D.3 (ADDP-D.02) Future Warfighting Concept*, Policy Guidance and Analysis Division, Department of Defence, Canberra, December 2003, p. 29.
22. *ibid.*, p. 16, 26. Luddy, *The Challenge and Promise of Network-Centric Warfare*, p. 3.
23. Edward A. Smith Jr., *Effects Based Operations: Applying Network Centric Warfare in Peace, Crisis, and War*, Department of Defense Command and Control Research Program, CCRP Publication Series, November 2002, p. 143.
24. *ibid.*, p. 144.
25. Till, *Seapower: A Guide for the Twenty-First Century*, p. 135.
26. David Stevens, 'Iraq Lessons: The More Things Change' in Glenn Kerr (ed.), *Australian Maritime Issues 2004: SPC-A Annual*, Papers in Australian Maritime Affairs No. 12, Sea Power Centre – Australia, Department of Defence, Canberra, 2004, p. 24.
27. Arthur Cebrowski, 'Network-Centric Warfare: An Emerging Military Response to the Information Age', *Military Technology*, Vol. 27, No. 5, 2003, p. 17. Original emphasis.
28. Brice Pacey, *National Effects-Based Approach: A Policy Discussion Paper*, Strategic and Defence Studies Centre Working Paper No. 381, Australian National University, Canberra, November 2003, p. 2.
29. Stephens, *The End of Strategy: Effects-Based Operations*, pp. 8–9.
30. *ibid.*, p. 5.
31. Till, *Seapower: A Guide for the Twenty-First Century*, pp. 164–165.
32. Admiral Sir Herbert Richmond, *Statesmen and Seapower*, Clarendon Press, London, 1946, p. 136, quoted in McCaffrie, *Maritime Strategy into the Twenty-first Century: Issues for Regional Navies*, p. 8.
33. Stephens, *The End of Strategy: Effects-Based Operations*, p. 14.

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