Golden Window of Opportunity:
A New Maritime Strategy and Force Structure for the Australian Navy

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The overall force structure of the Royal Australian Navy (RAN) has not been explicitly linked to Australian strategic objectives since the 1987 White Paper. This article proposes a new maritime strategy for common defence operations in South East Asia and the defence of Australia. It is based on sea denial by RAN submarines in enemy home waters, and a second layer to deny the approaches to the continent or the archipelago. The current fleet building programme, centred on Air Warfare Destroyers and new amphibious ships, is not aligned with these priorities. Both programmes should be cancelled or re-structured, and a continuous build of new submarines begun well in advance of the retirement of the *Collins* class boats.[1]

One of the main tasks before the authors of the new Defence White Paper is to derive long-term capability priorities from Australia's strategic objectives. This article will argue that there is a particular need to do so in the case of the Royal Australian Navy (RAN), whose force structure has not been coherently linked to strategic objectives since the 1987 *Defence of Australia* reforms. Based on a new maritime strategy, the article will demonstrate the advantage of moving towards a RAN based on a fleet of at least 12 submarines, continuously built every 20 months, and a reduced surface fleet.

Maritime Strategy and Australian Strategic Guidance

In order to make a judgment about the appropriateness of a navy force structure, it is first necessary to establish what that navy is to achieve, and how it is to do so.
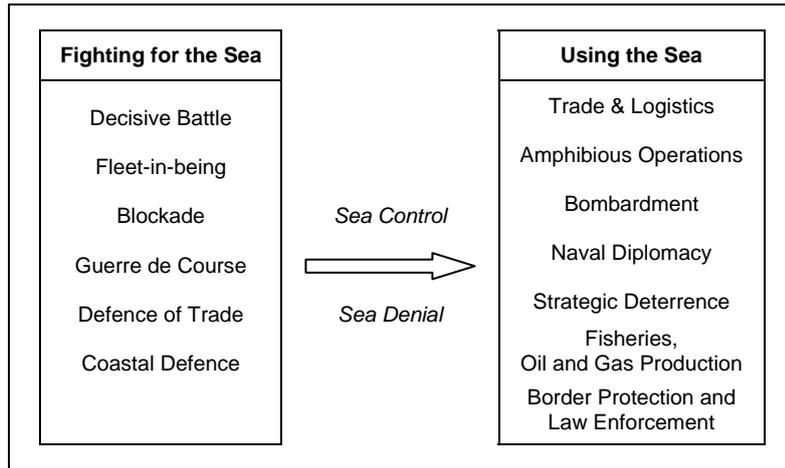
CONCEPTS OF MARITIME STRATEGY

Strategy in war is about forcing one's will on the adversary. At its most basic, the difference between maritime and continental strategy therefore comes down to the fact that humans live on land, not at sea. Achieving control over land makes it possible to deploy what J.C. Wylie famously called "the ultimate determinant in war", namely "the man on the scene with the

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gun."[2] In contrast, the sea does not have any similar intrinsic value in war. Its importance for military operations and strategy more broadly lies solely in what uses it can be put to—be it fisheries, trade, or the movement of military forces, to name but a few. While it is beyond the scope of this article to even attempt to summarize the whole corpus of maritime strategy, it is worth remarking that relevant concepts divide into three categories (see Figure 1):[3]

Figure 1: Concepts of Maritime Strategy

Fighting for the Sea		Using the Sea
Decisive Battle		Trade & Logistics
Fleet-in-being		Amphibious Operations
Blockade	*Sea Control*	Bombardment
Guerre de Course	→	Naval Diplomacy
Defence of Trade	*Sea Denial*	Strategic Deterrence
Coastal Defence		Fisheries, Oil and Gas Production
		Border Protection and Law Enforcement

Source: Based on: Geoffrey Till, *Maritime Strategy and the Nuclear Age* (New York: St. Martin's Press, second edition, 1984), p. 15.

- Concepts and activities that relate to using the sea in ways that directly affect the war or balance of power on land—such as trade and logistics, 'power projection' through amphibious operations or shore bombardment, naval diplomacy, or strategic deterrence—or which provide other benefits—such as law enforcement in territorial waters and the Economic Exclusion Zone (EEZ), or the extraction of resources such as fisheries or oil and gas.

- Concepts relating to the fight for the sea that makes these uses possible against the resistance of the enemy, or to deny the enemy particular uses. Much of the historical discussion of maritime strategy centred on the relative merits of, for example, the decisive battle and the fleet-in-being.

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[2] J.C. Wylie, *Military Strategy: A General Theory of Power Control* (Shrewsbury: Distributed by Tri-Service Press Ltd, 1989. Reprint with a new introduction. Originally published: New Brunswick, N.J.: Rutgers University Press, 1967), p. 72.
[3] While this figure is the author's, it is inspired by the discussion in Geoffrey Till, *Maritime Strategy and the Nuclear Age* (New York: St. Martin's Press, second edition, 1984), p. 15.

- Concepts describing the relationship between these two groups, and which relate to the extent to which one side has, through fighting or being prepared to fight, gained the ability to use, or deny the use, of a particular area of sea. At the operational level, 'sea control' and 'sea denial' are commonly used to make this connection.[4]

'Sea control' and 'sea denial' are thus not ends in themselves, they derive their value and meaning from the relationship between what the sea is to be used for, and how that use is to be made possible. However, as the following sections will show, that instrumental relationship has not always been properly reflected in Australian strategic guidance.

MARITIME STRATEGIC GUIDANCE AND THE 'DEFENCE OF AUSTRALIA'

The beginning of the public articulation of 'modern' Australian strategic policy was the 1972 *Australian Defence Review.*[5] In relation to the role of maritime forces, that document stated that

> By no stretch of imagination could Australia assume in the foreseeable future a capability to control—even if we were to wish to do so—the vast areas of ocean which give access to the coasts of our continent and dependencies—though in selected areas we need to be able to do this. Our broader maritime interests may be better served by being capable of denying to others the measure of control which they would need in order to threaten the interests of Australia or its immediate neighbours.[6]

Hence, a proposal by the RAN in 1973 for improved power projection capabilities in the form of carriers and amphibious ships did not find political support, but a fleet centred around a two-tier, 12 ship destroyer force (and the ageing carrier Melbourne) was centrally endorsed in 1975.[7]

Defence planning at that time was burdened by conflicting interpretations of the 'core force' concept, which was also less suitable to the capital intensive

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[4] And have largely superseded the older term 'command of the sea' and its geopolitical connotations. The RAN defines sea control as "That condition which exists when one has freedom of action to use an area of sea for one's own purposes for a period of time and, if required, deny its use to an adversary. The state includes the air space above, the water mass and seabed below as well as the electro-magnetic spectrum." Sea denial is defined as "That condition which exists when an adversary is denied the ability to use an area of the sea for his own purposes for a period of time." Chief of Navy, *Australian Maritime Doctrine* (Canberra: Defence Publishing Service, 2000), p. 162.

[5] Although there is of course a strong case for a significant continuity in Australian strategic policy that bridged the end of the 'era' of Forward Defence. See, for example, Paul Dibb and Richard Brabin-Smith, 'Indonesia in Australian Defence Planning', *Security Challenges*, vol. 3, no. 4 (November 2007), pp. 67-93.

[6] Department of Defence, *Australian Defence Review*, Canberra, Commonwealth of Australia, 1972, p. 21.

[7] Peter Jones, '1972-1983: Towards Self-Reliance,' in *The Australian Centenary History of Defence, Vol. III: The Royal Australian Navy*, ed. David Stevens (Oxford: Oxford University Press, 2001), pp. 216-223

services of Navy and Air Force than to the Army.[8] The 1976 White Paper mentioned "sea control in areas of Australia's maritime jurisdiction" and "quick detection of and response to any maritime or coastal harassment" as two tasks of the force-in-being.[9] While it was silent on the operational strategy for an 'expanded' force, the comment in the 1975 *Strategic Basis* that

> conventional forces can only attack Australia by using sea and air approaches, and Australian strategy should look to having adequate naval and air power for interdiction, including forward operations[10]

seemed to confirm rather than depart from the cautious remarks of the 1972 *Defence Review.*

Following a prolonged logjam in the Defence planning system,[11] the 1986 *Review of Australia's Defence Capabilities* laid the foundations for the 1987 *Defence of Australia* White Paper. Neither document makes explicit use of the terms 'sea control' or 'sea denial', although the *Review* termed its overall operational approach "a strategy of denial".[12] It demanded that "Australia's air and naval forces must have the capacity to destroy enemy forces, at credible levels of threat, in the sea and air gap".[13]

From general considerations regarding the likely conduct of 'low' and 'escalated low-level' conflict in Australia's North, the *Review* derived a force structure for the Navy that centred on

> a significant presence of surface patrol assets ... at the following five offshore focal areas: Dampier, Timor Sea, Arafura Sea and Torres Strait, Christmas Island, and the Indian Ocean approaches.[14]

This resulted in a requirement for 16 to 24 vessels,[15] with a mix of destroyer-class vessels capable of high-intensity conflict, patrol boats and a new 'Light Patrol Frigate.'[16]

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[8] J.O. Langtry and Desmond Ball, *Australia's Defence Forces at the Crossroads*, Reference Paper*,* no. 28 (Canberra: Strategic and Defence Studies Centre, Australian National University, 1979), p. 24.
[9] Department of Defence, *Australian Defence* (Canberra: Commonwealth of Australia, 1976), p. 13.
[10] Paul Dibb, *Review of Australia's Defence Capabilities* (Canberra: Commonwealth of Australia, 1986), p. 25.
[11] Eric Andrews, *The Australian Centenary History of Defence, Vol. V: The Department of Defence* (Oxford: Oxford University Press, 2001)*,* p. 245.
[12] Dibb, *Review of Australia's Defence Capabilities*, p. 49. The 1987 White Paper used the term of 'defence in depth' instead.
[13] Ibid., p. 51. The review did not use concepts of naval strategy, and its emphasis on 'destruction' of enemy forces sat somewhat uncomfortably with the 'fleet-in-being' aspects of its overall strategy.
[14] Ibid., p. 71.
[15] Ibid., p. 71.

The main judgments and policies of the 1987 White Paper, including its priority on denying enemy power projection into and across the sea-air gap as the guiding principle of naval force planning, remained the basis of Australian defence planning for more than a decade. But four (related) developments throughout the 1990s and into the 2000s began to unravel the bundle of its naval force structure judgments:

First, the 1986 *Review* with its focus on the defence of the continent had recommended that amphibious forces be gradually run down.[17] With growing instability in the South Pacific, this judgment was revised as early as the 1991 *Force Structure Review,*[18] and led to the acquisition of two LPA ships in the early 1990s. Hence, an important, positive use of the sea for military purpose was added to the 1987 construct.

Second, 'defence in depth' was criticised for being too reactive and not proposing any leverage over the enemy.[19] The 1994 White Paper re-introduced the term 'denial' when it required "capabilities which can deny our approaches to an adversary", but added that "We will continue to develop capabilities which allow the Australian Defence Force … to take the operational initiative".[20] As the 1997 *Australian Strategic Policy* pointed out,

[16] Ibid., pp. 72, 129-130; Department of Defence, *The Defence of Australia* (Canberra: Commonwealth of Australia, 1987), p. 44. Since surface vessels in low and escalated low-level conflict would patrol within the range of land-based fighters, and Australia would be unlikely to expose major units to a threat from the air in high-level conflict, the *Review* saw only a very circumscribed requirement for naval air defence. Dibb, *Review of Australia's Defence Capabilities*, p. 70.

[17] Ibid., pp. 104, 145.

[18] Department of Defence, *Force Structure Review* (Canberra: Commonwealth of Australia, 1991), p. 28.

[19] See, for example, Ross Babbage, 'Looking Beyond the Dibb Report,' *Working Paper*, no. 110 (Canberra: Strategic and Defence Studies Centre, Australian National University, 1986); Desmond Ball, 'Notes on Paul Dibb's Review of Australia's Defence Capabilities,' *Reference Paper,* no. 143 (Canberra: Strategic and Defence Studies Centre, Australian National University, 1986). See also the surveys in Andrew Mack, 'Defence Versus Offence: The Dibb Report and its Critics,' *Working Paper,* no. 14 (Canberra: Strategic and Defence Studies Centre, Australian National University, 1986), esp. pp. 1-5; and Matthew Gubb, 'How Valid was the Criticism of Paul Dibb's 'Review of Australia's Defence Capabilities'?,' *Working Paper,* no. 164 (Canberra: Strategic and Defence Studies Centre, Australian National University, 1986). The Dibb Review did, however, contain the statement that "[a] manifest capability to threaten bases from which an adversary's air and naval forces could attack Australia direct would be a disincentive to the use of those forces, and an inhibition on their deployment." (Dibb, *Review of Australia's Defence Capabilities*, pp. 65-66.) Stewart Woodman also criticizes the Dibb Review as missing a proper ADF operational strategy, which arguably led to an overemphasis on simultaneous naval coverage of several focal areas. Stewart Woodman, 'Defending the Moat: Maritime Strategy and Self-Reliance,' in David Stevens (ed.), *In Search of a Maritime Strategy: The maritime element in Australian defence planning since 1901*, Canberra Paper, no. 119 (Canberra: Strategic and Defence Studies Centre, Australian National University, 1997), pp. 128-135.

[20] Department of Defence, *Defending Australia* (Canberra: Commonwealth of Australia, 1994), p. 14. However, it also used the term 'barrier', writing that: "Developing our capabilities to take

this shift was also required because of the third and fourth developments, the gradual erosion of Australia's regional 'capability edge' and the increasing importance placed on using the Australian Defence Force (ADF) in operations beyond the direct defence of the continent.[21]

MARITIME STRATEGIC GUIDANCE IN *DEFENCE 2000*

Hence, all four of these trends combined to pull the ADF from passive blockade and barrier operations focused on denial, to a more active posture of seeking battle, if not (yet) outright sea control. One of the main challenges of the *Defence 2000* White Paper was to assess the consequences of these developments, and to provide a replacement for the 1986 *Review*'s framework for establishing force structure priorities.

In some ways, *Defence 2000* did indeed break new ground in Australian strategic guidance. The definition of five strategic objectives prioritized between Australia's increased strategic ambitions beyond the approaches to the continent. In future, the 'defence of Australia' role of the Navy was to be complemented by a capability to make 'substantial' and 'significant' contributions to coalition operations in high-intensity conflicts in South East Asia and the wider Asia-Pacific, and the ability to support Army-dominated stabilization operations in the South West Pacific.[22]

The White Paper confirmed that Australia would actively seek battle at the operational level, including attacks against enemy bases,[23] which is perhaps why it ended up blurring the concepts of denial and control, and their respective negative and positive purposes:

> The key to defending Australia is *to control* the air and sea approaches to our continent, *so as to deny* them to hostile ships and aircraft, and provide maximum freedom of action for our forces.[24]

The White Paper remained silent on how to use this broad framework to derive clear force structure principles. In particular, it did not provide any

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advantage of our strategic geography means, most importantly, making our sea and air approaches an effective barrier to attack. We therefore give clear priority to the naval and air capabilities required to deny our sea and air approaches to an adversary." (p. 26)

[21] Department of Defence, *Australia's Strategic Policy* (Canberra: Commonwealth of Australia, 1997), p. 46. A practical consequence was a growing acknowledgement, if not emphasis on, the role of the submarine fleet. While its justification in the 1986 *Review* had been derived primarily from its role in the expansion base, (Dibb, *Review of Australia's Defence Capabilities*, pp. 66-67.) the 1997 *ASP* explicitly state that "combat aircraft, submarines and surface combatants … would be our first line of defence and are our highest priority." (Department of Defence, *Australia's Strategic Policy*, p. 45).

[22] For a summary and critique of that framework, see Stephan Frühling, 'A New Defence White Paper: Moving On From The Five Circles?', *Security Challenges*, vol. 3, no. 4 (November 2007), pp. 95-112.

[23] Department of Defence, *Defence 2000* (Canberra: Commonwealth of Australia, 2000), p. 48.

[24] Ibid., p. 47. Emphasis added.

further guidance as to what Australian forces were meant to do with the 'maximum freedom of action' it called for and which, if the above statement is closely read, is seen as an objective *in addition* to the denial of the sea and air approaches.

This lack of clarity became particularly important because the White Paper also failed to provide criteria for the evaluation of major naval procurement programs in the area of air defence and amphibious lift. Plans for the replacement of both are noted, but in the absence of a clear military strategy not directly linked to strategic objectives.[25] Hence, the White Paper ultimately did not specify whether the 'maximum freedom of action' for RAN operations was to be a mere side-effect of successful denial operations, or whether it should be used to actively force an end to hostilities through, for example, surface action groups that might interrupt inter-archipelagic waterways, or amphibious landings.[26]

THE *DEFENCE UPDATES*: OBJECTIVE-CAPABILITY DISCONNECT

The *Defence Update 2005* provided a partial answer to that question, when it wrote in a passage worth quoting at length:

> The acquisition of new amphibious ships will extend the assured reach of the ADF and allow for the deployment of larger and heavier forces … New air warfare destroyers will help protect those forces during a deployment. The Collins class submarines with a new combat system and new heavy torpedos will add to that protection. So too will the ever more capable ANZAC frigates and FFGs with SM2 missiles. These will be complemented by the best maritime surveillance aircraft in the world.[27]

Yet it remained silent on how this impressive force would contribute to attaining any of the strategic objectives set out in the 2000 White Paper. Was the intention to conquer and hold territory to Australia's North? To conduct raids against enemy bases? Or is it merely seen as a contribution to coalition operations, in which case the question poses itself of why the ADF would try to supply all elements of the strike group?

It is of course possible to conduct defence planning by justifying capabilities on tactical considerations alone (such as the necessary elements of an amphibious group), rather than deductively deriving them from strategic

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[25] Ibid., pp. 84, 90. Hugh White, principal author of the White Paper, later stated that the document was drafted under instructions from the Cabinet that no capability was to be cut, and obsolete equipment to be replaced. Hugh White, 'Buying Air Warfare Destroyers: A Strategic Decision,' *Issues Brief* (Sydney: Lowy Institute, 2005), p. 3.

[26] The White Paper comment that without the air warfare destroyers "our ships … would be less capable of defending forces deployed offshore and less capable of contributing effectively to coalition naval operations" (Department of Defence, *Defence 2000,* p. 89) is also consistent with a use of amphibious forces in Australian-led high-intensity operations.

[27] Department of Defence, *Australia's National Security: A Defence Update 2005* (Canberra: Commonwealth of Australia, 2005), p. 23.

objectives. Both New Zealand's concept of 'task-based planning',[28] and the American construct of 'capabilities-based planning' are examples of such approaches.[29] But they do not provide a coherent basis for making decisions on quantitative requirements, or on the relative priority between different capabilities, and lead to purchases that Kim Beazley aptly called 'boutique'.[30] For a country like Australia, however, which has neither resigned itself to 'doing as it must' like New Zealand, nor attained the status of being able to 'do as it wants' like the United States, criteria for both sufficiency and minimum requirements are essential for any coherent defence planning process.

While the 2005 *Defence Update* had thus significantly increased Australia's naval ambitions by arguing for particular capabilities 'from the bottom up', the *Defence Update 2007* did the same for Australia's maritime strategy 'from the top down'. Dropping the focus on the approaches to the continent that was still part of *Defence 2000*, it demanded that the RAN "must be able to establish *sea control and operate freely within our region*, while denying such freedoms to an opponent".[31] Hence, if we are to follow the logic of current strategic guidance, regional sea control—judged attainable by "no stretch of imagination" in 1972, when Australia spent 3.4% of its GNP[32] on defence—has somehow become feasible today, despite growing regional capabilities and a defence expenditure of only 2% of GDP.[33] Yet on the two all important questions of how such a remarkable feat is to be achieved in operational terms, or how such a measure of control should actually be used to end a conflict on Australia's terms, the *Update* remains silent.[34]

A New Maritime Strategy

Hence, no coherent framework to define naval force structure priorities has yet emerged from strategic guidance since the 1986 *Review*, and exegesis of recent documents supports a whole range of conflicting interpretations. One of the main tasks of the new White Paper will thus be to develop a maritime strategy that can serve to establish capability priorities.

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[28] New Zealand Ministry of Defence and New Zealand Defence Force, *The Defence of New Zealand 1991* (Wellington: New Zealand Government, 1991).
[29] Office of the Secretary of Defense, *Quadrennial Defense Review Report* (Washington D.C.: Department of Defense, 2001); Paul K. Davis, *Analytic Architecture for Capabilities-Based Planning, Mission-System Analysis, and Transformation* (Santa Monica: RAND, 2002).
[30] Quoted in: Cameron Stewart, 'Sub fleet should be doubled: Beazley', *The Australian*, 29 December 2007.
[31] Department of Defence, *Australia's National Security: A Defence Update 2007* (Canberra: Commonwealth of Australia, 2007), p. 50. Emphasis added.
[32] Department of Defence, *Australian Defence Review*, p. 39.
[33] Mark Thomson, *The Cost of Defence: ASPI Defence Budget Brief 2007-2008* (Canberra: ASPI, 2007), p. vi.
[34] Tellingly, however, it falls into the common trap of confusing capability with strategy when it remarks that the AWD would be a "strategic force". Department of Defence, *Australia's National Security: A Defence Update 2007*, p. 50.

AUSTRALIAN STRATEGIC OBJECTIVES AND RAN ROLES

A new authoritative statement of Australian strategic objectives should of course be part of the White Paper to be published later this year. For the purposes of the argument herein, it will hence be assumed that these objectives will not be fundamentally different from those espoused in both the *Defence 2000* White Paper, and the 2007 *Defence Update*. This would mean that there would be five main objectives for the ADF as a whole:[35]

1) *Defence of Australia:* The ADF must be self-reliant in combat forces necessary to defend the Australian continent against attack by regional powers from within the archipelago to Australia's North.

2) *Common Defence in South East Asia:* The ADF should be able to make a core contribution around which a common defence operation with allied South East Asian countries could be mounted to meet a threat to regional order from within or outside the archipelago.

    Given regional geography, there will be a significant overlap between the capabilities required for these two objectives, which will be discussed in detail below.

3) *Stabilization of South West Pacific*: The ADF must be able to support the capability of regional governments in the South West Pacific in maintaining law and order, and have a surge capacity to restore order should they fail to do so. It should be self-reliant in this task, including however a New Zealand contribution.

    The main requirements for the RAN force structure that flow from this objective are for a capability to patrol South Pacific waters, and for amphibious lift.

4) *Global Coalition Operations*: The ADF must be able to make contributions to global coalition operations both in high-intensity and low-intensity operations, which can include a substantial part of Australia's forces, but will only be a minor component of the overall operation.

    In the following, it will be assumed that the RAN should be able to make contributions to both types of coalition operations, but that a continuous Australian commitment may require alternating contributions from all services of capabilities that derive their primary justification from objectives in which Australia aims for self-reliance.

5) *Support to Civil Authorities:* In the absence of a Coast Guard, the RAN will have to make a contribution to Australia's capability to police its

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[35] See also the discussion in: Frühling, 'A New Defence White Paper: Moving On From The Five Circles?'.

territorial waters. Based on Sam Bateman's discussion of this issue, this contribution will be assumed to consist of the equivalent of the current patrol boat fleet, as well as a more capable Offshore Patrol Vessel (OPV) capability.[36]

Over the coming decades, these objectives will have to be achieved in a strategic environment that will most likely be characterized by a continuing erosion, in relative terms, of the position of Australia and its main Pacific allies in demographic, economic, and military terms—and that not only vis-à-vis South East Asian countries, but also compared with India and, in particular, China.[37] In the absence of a durable and generally accepted international order in the Asia-Pacific that provides a stable framework to accommodate these trends, the main drivers of ADF force structure priorities in general, and of RAN major combatants in particular, should be common defence operations in South East Asia and the defence of Australia.

A TWO-TIERED MARITIME STRATEGY
FOR THE DEFENCE OF AUSTRALIA AND SOUTH EAST ASIA

The primary Australian goal in both common defence operations in South East Asia and the defence of Australia is the prevention of enemy power projection: From the archipelago into Australia, within the archipelago, or from the Asian mainland into the archipelago. A capability of denying the enemy the use of the sea for bombardment or amphibious operations must hence be the first priority with regards to both of these objectives. This does not, however, mean that Australia can base its strategy on barrier operations in the 'air-sea gap', as the 1986 *Review* had done. Such a strategy does not address the common defence objective in South East Asia. It also does not account for the fact that, with increasing regional capabilities, the ADF may be placed at an increasing disadvantage if the enemy retained safe rear areas.

From this it follows that the first layer of Australian forces will have to be able to operate in force at a greater distance from home bases, and closer to those of the enemy. More precisely, Australia should aim to prevent the movement of enemy naval forces in their home waters, in order to reduce their ability to concentrate and conduct operations towards the South. This implies that Australia should be able to conduct close blockades of select harbours, and distant blockades at straits out of and within the archipelago, in addition to having a second layer of forces available to interdict those enemy forces that still manage to reach the air-sea gap itself. In common

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[36] Sam Bateman, 'Securing Australia's Maritime Approaches', *Security Challenges*, vol. 3, no. 3 (August 2007), pp. 109-129. See also: Andrew Forbes, *Protecting the National Interest: Naval Constabulary Operations in Australia's Exclusive Zone* (Canberra: Sea Power Centre, 2002).
[37] See, for example, Allan Behm, *Strategic Tides: Positioning Australia's Security Policy to 2050*, Kokoda Paper, no. 6 (Canberra: Kokoda Foundation, 2007); Ross Babbage, 'Learning to Walk Amongst Giants: The New Defence White Paper', *Security Challenges*, vol. 4, no. 1 (Autumn 2008), pp. 13-20.

defence operations, the same logic would apply, with the first layer of Australian forces interdicting shipping and imposing blockades close to the Asian mainland, in order to reduce the threat to the second layer operating closer to the archipelago itself.

Close proximity to enemy home areas requires highly survivable Australian platforms for the first layer. Given the huge areas in which enemy operations need to be interdicted, or at least interfered with, Australian platforms will not be able to be everywhere all the time. Hence, stealth is also essential to deny the enemy information about the location of Australian assets. Furthermore, the necessarily thin spread of Australian forces would require these to be highly lethal. For all three of these reasons, the first layer of Australian forces will have to consist of submarines, in combination with a robust sea-mining capability. Any forces that they successfully blockade within harbours, as well as enemy Anti-Submarine Warfare (ASW) forces, would in addition face the prospect of intermittent attack by Australian fighter-bomber and, depending on air defence capabilities, Maritime Patrol Aircraft (MPA) with standoff weapons. Even the submarines themselves, armed with Tomahawk, anti-ship missiles and air defence missiles, would be a significant threat to these forces.

The minimum size of a submarine fleet that was necessary for the first layer depends on the enemy's resolve to conduct offensive operations despite the risk of losses to Australian submarines, and the ASW threat to these boats. In present circumstances, ASW capabilities of regional and mainland powers are very limited. In credible contingencies, a regional enemy's war against Australia would either be limited in goals, or a secondary theatre of a wider conflict involving other major powers in Asia. As long as both of these conditions persist, the minimum size of a submarine force for the first layer flows primarily from the size of the theatre in which they would have to operate, and the need to leave the enemy in doubt about the position of Australian forces even if an Australian submarine is detected. This would require a minimum permanent presence of four boats, operating in two groups of two: If one of these boats was detected, there would still be no assurance for the enemy that there was not another, undetected boat in a different area, nor would it be certain that there was not a second boat close to the confirmed contact. If account is made for transits and maintenance requirements, this would translate into a minimum requirement for a fleet of twelve boats as a first-order priority.[38] In order to be prepared for a change in the aforementioned conditions, a capability to expand the force would also be desirable.

The second layer of Australian forces, operating in the air-sea gap or, in common defence operations, in the archipelago, can then be thought of as a

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[38] Greater numbers in the area might also be achievable by introducing submarine tenders that could be used for re-supply closer to the theatre of operations.

fleet-in-being. Its effect lies as much in the deterrence of small-scale operations of individual or pairs of vessels that may be able to escape the forward deployed submarines, as it does in the interdiction of such forces that do move further south. The closer proximity to Australian or allied bases, and the speed that may be required to reach enemy forces, argue in favour of using land-based aircraft for this mission, together with seamines and any submarines that may transit through the area. Hence, there is a first-order priority for a substantial fighter-bomber force with maritime attack capabilities, as well as MPAs that can operate under their defensive screen.

AMPHIBIOUS OPERATIONS, SURFACE ACTION GROUPS, AND THE LURE OF DECISIVENESS

As discussed above, the 2005 *Defence Update* suggested that Australia would in the future want to operate amphibious battle groups in the face of significant enemy air, surface, sub-surface and land capabilities. Such a proposition is also supported by commentators who place particular emphasis on amphibious operations as part of "classical maritime strategy".[39] At first glace, this is attractive because, as Julian Corbett wrote:

> it is almost impossible that a war can be decided by naval action alone. Unaided, naval pressure can only work by a process of exhaustion. Its effects must always be slow, and so galling both to our own commercial community and to neutrals, that the tendency is always to accept terms of peace that are far from conclusive.[40]

If Australia based its strategy on the denial of sea communications in the archipelago, as recommended herein, leverage to force an end to hostilities would indeed be largely limited to imposing economic blockades, air strikes and special forces operations that could, for example, serve to exacerbate ethnic tensions in the archipelago. While such an approach would leave Australia in a much better and more sustainable position that its adversary, it does not provide a way to force an end to hostilities if the enemy persists in maintaining its resistance.

But it is doubtful whether even a series of amphibious raids, or a surface action group cruising the archipelago, could impose the same restrictions on the enemy as a continued denial of intra-archipelago communications. Small is not always beautiful. The Australian Army—even 'hardened and networked'—is not anywhere near the size required to hold territory against land forces of those regional countries that could pose threats to an amphibious group which would justify the protection described in the *Update*. Hence, if it was able to conduct amphibious operations in high-intensity

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[39] Bruce McLennan and Gregory P. Gilbert, 'Amphibious Ships—Bigger is Better', *Quadrant*, vol. 50, no. 9 (September 2006), pp. 52-59; Michael Evans, *The Role of the Australian Army in a Maritime Concept of Strategy*, Working Paper, no. 101 (Canberra: Land Warfare Studies Centre, 1998).

[40] Julian S. Corbett, *Some Principles of Maritime Strategy* (Annapolis, MD: Naval Institute Press, 1988. Originally published 1911), pp. 15-16.

conflicts at all, the ADF would be limited to conducting raids against positions that it would have to vacate before enemy forces counter-concentrated against the landing.[41]

But while an Australian submarine fleet of 12 boats or more could remain viable even after the loss of two or three units, such a level of attrition would cripple surface forces as described in the *Update*. In this context, it is worth keeping in mind that "U.S. Navy exercises with diesel submarines have often proved humbling", as John R. Benedict warns, and that even the British Navy with its Cold War focus on ASW proved to be seriously challenged by a single Argentinean submarine in the Falklands War of 1982.[42] Hence, even sustained investment in Australia's atrophying ASW capability will make surface ship operations in the face of enemy submarines a gamble.[43] This matters because failed maritime operations can lead to much worse than national foundation myths—the next Australian one could well turn out to be a modern Sicilian expedition.[44] Therefore, amphibious forces and surface action groups that would be able to operate into the same waters as the first layer cannot replace the force structure outlined above. Given Australia's limited resources, they should not be introduced.

NAVAL DIPLOMACY, PROTECTION OF TRADE AND LONG-RANGE PATROL: PUTTING SURFACE COMBATANTS INTO PERSPECTIVE

This leaves the question of what roles should guide the force structure of the RAN surface fleet. Amphibious forces for contingencies in the South West Pacific will be discussed below. In addition, there remains a need for surface combatants, but their justification rests on a number of very circumscribed, second-tier priorities:

The RAN should include an ocean-going surface combatant that can be used for showing the flag, naval diplomacy or as a contribution to, for example, embargo operations. However, in crisis situations its role is that of a 'tripwire' that would force the enemy to choose war—not that of a deterrent, or of a means to achieve sea control. If exposed to attack, limited defensive systems would give it a chance to conduct a fighting retreat. The

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[41] A very similar issue lay at the heart of the US Navy's 'Maritime Strategy' of the 1980s, which included carrier and amphibious raids against the Soviet Navy's forces on the Kola Peninsula. But it must be remembered that these were only meant to complement an offensive of significant numbers of nuclear attack submarines, and that their diversion to that task was severely criticized as a distraction from higher priorities at the time. For background and an extensive bibliography on the 'Maritime Strategy', see John B. Hattendorf, *The Evolution of the U.S. Navy's Maritime Strategy, 1977–1986*, Newport Paper, no. 19 (Newport, RI: Naval War College, 2004.

[42] John R. Benedict, 'The Unraveling and Revitalization of U.S. Navy Antisubmarine Warfare', *Naval War College Review*, vol. 58, no. 2 (Spring 2005), p. 100.

[43] This is not even to mention land-based anti-ship cruise missiles, which in an archipelagic environment would be a constant and dangerous threat.

[44] The failed Sicilian expedition (415-413 BC) broke Athenian power and led to its ultimate defeat in the Peloponnesian War.

upgraded ANZAC frigates with Harpoon, Evolved Sea Sparrow Missile, Phalanx and their ability to embark a helicopter are a good example of such a vessel. If it was assumed that Australia would like to be able to keep two ships on station, a total fleet of six would seem appropriate.

Australia will also try to keep the export ports on the Northern coast of the continent open as long as possible during times of tension and war. This means that a capability to provide at a limited escort for convoys in the North could be desirable, for which a vessel as discussed above would also be suitable. That said, given the difficulty of littoral ASW mentioned above, the proposition that Australia could protect coastal shipping or the North West shelf in all contingencies is unrealistic—none the least since international shipping companies might well decline even a low risk in favour of consignments elsewhere.[45] The same is, of course, even more the case for international shipping lanes through the archipelago.

Hence, a more realistic planning basis is to be able to protect shipping into and out of more southerly ports, such as between Brisbane and Freemantle. Here, geographic distance from enemy base areas works in Australia's favour, as surface and air threats are very limited, and submarines need to travel long distances parallel to a hostile shore. Whether convoyed or not, shipping on the Indian and Pacific oceans would also require a defence against submarine and surface raider threats. However, that threat would be very limited as the reach of maritime platforms of South East Asian countries is likely to remain relatively short, and Australia would not be a priority target in any war involving a mainland Asian great power. Hence, the main justification for a protection of shipping capability lies in its deterrent effect, as completely unprotected convoys and harbor approaches might otherwise make tempting targets.

Vessels with towed array sonars,[46] MPAs and ASW helicopters—based on shore, on surface combatants or merchant ships—would be sufficient to protect shipping in convoy or in the focal areas. Hydrophones in the approaches to the continent may be of use in detecting enemy submarines in the future.[47] In addition, there is a need to be able to clear mines that may be laid in the approaches to the ports. Given the nature of the threat, there is no requirement to protect ASW forces from concentrated air attack, nor is

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[45] Michael C. Grubb points out that the behaviour of shipping companies during the 1980s tanker war in the Gulf should not be seen as a precedent for similar situations, as freight rates were low elsewhere at the time, and the absence of alternative sources of supply meant that oil cargoes from the Gulf paid very high premiums. Michael C. Grubb, 'Merchant Shipping in a Chinese Blockade of Taiwan', *Naval War College Review*, vol. 60, no. 1 (Winter 2007), pp. 81-101.

[46] The 1991 *Force Structure Review* last mentioned dedicated towed acoustic array ships, (Department of Defence, *Force Structure Review*, p. 11), which had been studied in the ASTASS program (and subsequently evolved into SEA1100).

[47] They were mentioned in the 1994 White Paper, without ever being deployed: Department of Defence, *Defending Australia*, p. 40.

a capability to protect ships in company from missile attack justified, given the ability of large merchant vessels to absorb significant punishment. Hence, although the surface combatant mentioned above would be useful in the protection of shipping, OPV with even more limited self-defence capabilities—as required for peacetime duties in support to the civil authorities—could also be used to embark helicopters, and tow sonars.

STABILIZATION OPERATIONS IN THE SOUTH WEST PACIFIC

It follows from the above that the primary requirement for amphibious capabilities flows from the need to support stabilization operations in the South West Pacific, where Australia has assumed a 'regional neighbourhood watch role'[48] in recent years that is unlikely to end anytime soon. *Defence 2000* had written that this role

> might require the ADF to contribute to regional peacekeeping and humanitarian relief operations and help evacuate Australians and others from regional troublespots.[49]

The White Paper did remark that "Forces may need to be inserted, and evacuees extracted, sometimes in dangerous circumstances".[50] Subsequent guidance however has highlighted Australia's willingness to assist regional countries forestall, rather than remedy, a total breakdown of law and order. This amounts to a long-term commitment to regional capability-building,[51] tasks in which ADF contributions are supplemented by, or often only support, wider civilian and Australian Federal Police (AFP) efforts.[52]

Even though Australian forces should always have a capability to escalate and overcome local resistance. But amphibious forces predicated on the notion that it would be required to land a full battalion battlegroup, including tanks and artillery, in the first wave, imply that Australian forces would land against the active resistance of local authorities that are sufficiently strong to marshal, control and direct significant and effective armed forces. Such a re-enactment of the 1983 invasion of Grenada is out of sync with the main challenges of regional countries and Australian stabilization efforts described

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[48] Bob Breen, 'Peace support operations', in *Australia and the South Pacific: Rising to the Challenge*, pp. 43-53.
[49] Department of Defence, *Defence 2000*, p. 49.
[50] Ibid., p. 50.
[51] Department of Defence, *Australia's National Security: A Defence Update 2007*, pp. 31-32.
[52] Ross Babbage, 'Four Key Defence Capability Challenges', *Security Challenges*, vol. 3, no. 3 (August 2007), pp. 83-85; Andrew Goldsmith and Bob Lowry, 'Security sector reform', in *Australia and the South Pacific*, pp. 29-42; John McFarlane, 'The Thin Blue Line: The Strategic Role of the Australian Federal Police', *Security Challenges,* vol. 3, no. 3 (August 2007), pp. 91-108.

above. It also ignores the wider political context of Australia's relations with countries in the South Pacific, which are unlikely to support such a move.[53]

Hence, there is a premium in Australia's circumstances for amphibious lift capability for stabilization operations that allows to deploy ships for longer time periods to concurrent operations, consistent with reports that

> internal Army and DSTO simulation, modelling and experimentation had all pointed to a clear preference within Defence for a larger number … of somewhat smaller 12,000 ton LPDs [before the two 27,000 ton LHDs were selected].[54]

It is true that the average cost of internal volume provided by smaller ships is higher than for bigger ones, and larger ships tend to be more survivable than smaller ones.[55] Yet that matters little if capability is purchased beyond priority requirements, at a cost of $1bn more than originally programmed in the 2004 Defence Capability Plan (DCP),[56] and when Australia's strategic circumstances do not require amphibious operations against significant opposition anyway.

Therefore, amphibious forces in the Australian case should be thought of as a solution to a logistical problem, rather than as a capability to manoeuvre at the operational level.[57] A capability of 3-4 ships consisting of a mix of LPD in the 12,000 ton range and sealift ships is appropriate for Australia's strategic circumstances. The surface combatants discussed above could be used to protect them, if required, from threats that are realistic to expect in the region, such as fast attack craft.

In addition, there is a role in stabilization operations in the South Pacific for patrol capabilities very similar to those required for the patrol of the Australian territorial waters and EEZ.[58] If there is then still spare cash available for stabilization missions, it is highly likely that other capabilities within the ADF or AFP would trump the advantages of an increase in amphibious lift.

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[53] Consistent with this assessment, it is worth noting that the 2000 White Paper remarked that Australia would use armed force only with the support of its neigbours. Department of Defence, *Defence 2000*, p. 51.

[54] Aldo Borgu, *Capability of First Resort? Australia's Future Amphibious Requirement*, Strategic Insight, no. 8 (Canberra: ASPI, 2004), p. 8.

[55] Bruce McLennan and Gregory P. Gilbert, 'Amphibious Ships—Bigger is Better', p. 55.

[56] Borgu, *Capability of First Resort? Australia's Future Amphibious Requirement*, p. 7.

[57] Russel Parkin, *A Capability of First Resort: Amphibious Operations and Australian Defence Policy 1901-2001*, Centre Working Paper, no. 117 (Canberra: Land Warfare Studies Centre, 2002), pp. 38.

[58] Sam Bateman and Anthony Bergin, 'Maritime security', in *Australia and the South Pacific: Rising to the Challenge,* Special Report, no. 12 (Canberra: ASPI, 2008), esp. pp. 67-73.

Future Ships and Submarines:
A New Force Structure for the Royal Australian Navy

The capability priorities that the previous section derived from strategic objectives and the proposed maritime strategy are largely generic, partly overlap, and must be realized in the context of today's legacy fleet.

FUTURE REQUIREMENTS: HOW DOES TODAY'S FLEET MEASURE UP?

The current RAN force structure covers a number of the above requirements, but there are significant shortfalls in several areas. In addition, today's major acquisition programs are not aligned with the priorities defined above:

The submarine fleet should comprise a minimum of 12 boats for sea denial operations in the archipelago (or north of it). Today, there are only six Collins class boats in service. With a planned service life of 30 years, no replacement is programmed until 2025-2033. A submarine tender to increase the operational effectiveness of available boats is not currently available. In addition, a capability to expand the submarine fleet in reaction to strategic warning would also be highly desirable.

The main element of the surface fleet should consist of a vessel in the 4000 ton range, with surface attack, ASW and self-defence capabilities comparable to the relative capabilities of today's ANZAC frigates.[59] These vessels would be used for naval diplomacy in the region and beyond, in the protection of focal areas and shipping against limited submarine and surface attack, and could also be used to contribute to global coalition operations. There are currently 8 ANZAC and 4 ADELAIDE (FFG) frigates (down from 6 in the early 2000s) in service, whose capabilities are appropriate for these roles. Under current plans, the remaining FFG will be retired from 2013 and replaced by three Air Warfare Destroyers (AWD). However, the capability represented by the AWD is beyond that required for the surface combatants in the maritime strategy outlined above.[60]

Australia lacks a heavier OPV that could replace the vessel *Oceanic Viking* leased by the Australian Customs Service (ACS). There is therefore an argument to complement the frigate fleet by a number of dedicated OPVs in service with the RAN and/or ACS, which could also be employed in long-

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[59] Given the continuing improvement and development of weapon system technology, in particular in the area of radar and missiles, these vessels will probably be more capable than their predecessors, and perhaps significantly so. However, the justification of new capabilities would still have to be derived from their relatively circumscribed roles in high-intensity combat.
[60] The AWD are in principle suited for anti-ballistic missile defence missions with SM-3 missiles. However, because of its limited burnout velocity, that missile is not suited to defend Australia from attack by intercontinental missiles from, for example, North Korea. See Stephan Frühling, *Ballistic Missile Defence for Australia: Policies, Requirements, and Options*, Canberra Paper, no. 151 (Canberra: Strategic and Defence Studies Centre, ANU, 2003), pp. 67-72.

range patrols and assistance missions in the South Pacific, and, equipped with towed acoustic arrays, contribute to the ASW surveillance of focal areas. In order to increase fleet commonality, the OPV could be based on the same hull as the frigate, but not equipped with any weapons systems other than a main gun.   Internally, it should instead feature detention facilities, and perhaps additional crewing compartments to embark ADF and civilian personnel for exercises and assistance missions in the South Pacific. Additional study would be required regarding the optimum size and composition of the surface fleet, but since six ships are required to keep two frigates on different permanent stations, ten ships with 3-4 of them being of the OPV variant seems consistent with the priorities identified in this article. That number may increase, should the current fleet of patrol boats not be replaced by a similar capability at the end of their lifetime.

The current amphibious fleet of two LPA (*Manoora* and *Kanimbla*), the heavy landing ship *Tobruk* and six smaller landing vessels is roughly appropriate in size for amphibious lift in the South West Pacific. It should be renewed as originally planned in the 2004 DCP with a mix of 3-4 LPD of slightly larger capability in the 12,000 range, and one or more sealift ships. The currently planned two LHD represent an excess of capability beyond the priority requirements.

In terms of mine warfare, Australia has a priority requirement for a robust capability to deploy mines throughout Australian waters, the approaches to the continent and beyond, which is not covered at all in the current force structure. A capability to clear mines from 2-3 areas simultaneously, such as the approaches to major ports, is also required and met by six relatively young mine countermeasures ships in service today (Two of these are however used for patrol duties only).

The P-3 Orion MPA are a capability that will be required in the future as well, and their programmed replacement with manned and unmanned systems is consistent with the strategy outlined above. A need for maritime helicopters with ASW and anti-surface roles will also continue to exist in the future, and is only partly met today.   An upgrade of the Seahawk helicopters and procurement of new helicopters are thus consistent with the framework outlined above,[61] although the exact number and capability of new platforms would require additional study (for example, on current plans the Seahawks will not be fitted with ASW dipping sonars).[62]

The question of using hydrophones in the approaches to the continent should be re-visited. Finally, it is important to point out that the maritime

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[61] Joris Janssen Lok, 'Australia Kills Super Seasprite Program', *Aviation Week*, 5 March 2008, <http://www.aviationweek.com/aw/generic/story_channel.jsp?channel=defense&id=news/SEA0 3058.xml> [Accessed 22 April 2008].
[62] Andrew Davies, *ADF capability review: Royal Australian Navy,* Policy Analysis, no. 23 (Canberra: ASPI, 2008), p. 6.

strategy above also has important capability implications for the Air Force, which would be required to conduct attacks on maritime forces and bases in the archipelago, and to perform air defence and maritime strike tasks over the approaches to the continent. Given the geographic extent of area to be covered, a force of 100 Joint Strike Fighter (JSF) aircraft or equivalent seems a lower bound rather than excessive for the second layer.[63]

A WINDOW OF OPPORTUNITY: CONTINUOUS BUILD OF SUBMARINES

What the above analysis suggests is that a re-alignment of the RAN's force structure with strategic priorities would require major adjustments to its current trajectory. A doubling of the submarine fleet while keeping surface combatant numbers at levels not much below those of today will require rigorous discipline in setting priorities, and a procurement and life-support model in which cost-effectiveness must be of primary consideration. However, the current White Paper comes at a time where a golden opportunity (still) exists to make such a shift possible. Partly, this is due to the fact that excess capability lies in the amphibious ship and AWD programs. Both have entered the final design and production phase with substantial sunk costs, but it should still be possible cancel them and reprogram significant funds currently earmarked for these two projects.

Far more important than this, however, is the fact that the Collins fleet still has roughly two decades of useful service life left, while its overall size is smaller than the minimum requirement of twelve boats. The combination of these two factors presents Australia with a window of opportunity to move away from a start-stop procurement system for submarines in which a whole class is built every 30 years at rates of about one unit per year. Instead, Australia can begin the continuous production of submarines, with new boats being launched about every second year. However, because the whole idea of the continuous build system is based on reduced construction rates, a *transition must occur well before the service lifetime end of the class to be replaced* (See Figure 2).

A continuous build system would eliminate the cyclical expansion and contraction of industry capability, in both quantitative and qualitative terms, of the current system.[64] It would reduce average unit costs, because new shipbuilding programmes involve significant set-up costs, and learning effects lead to significant reductions in labour input that only stabilize at about the fourth or fifth vessel.[65] In addition, it would reduce the project risk

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[63] See the discussion in Peter Nicholson and David Connery, *Australia's Future Joint Strike Fighter Fleet: How much is too little?*, Kokoda Paper, no. 2 (Canberra: Kokoda Foundation, 2005).

[64] For a discussion of this problem, see Standing Committee on Foreign Affairs, Defence and Trade, *Blue water ships: consolidating past achievements* (Canberra: Parliament of Australia, 2006), esp. pp. 260-264.

[65] Australian Submarine Corporation, *Improving the Cost-Effectiveness of Naval Shipbuilding in Australia*, Submission to the Senate Foreign Affairs, Defence and Trade References Committee

of later hull services and combat system upgrades, as the design and construction work involved would to some extent mirror the construction process of newer vessels of the class.

Figure 2: Submarine Replacement
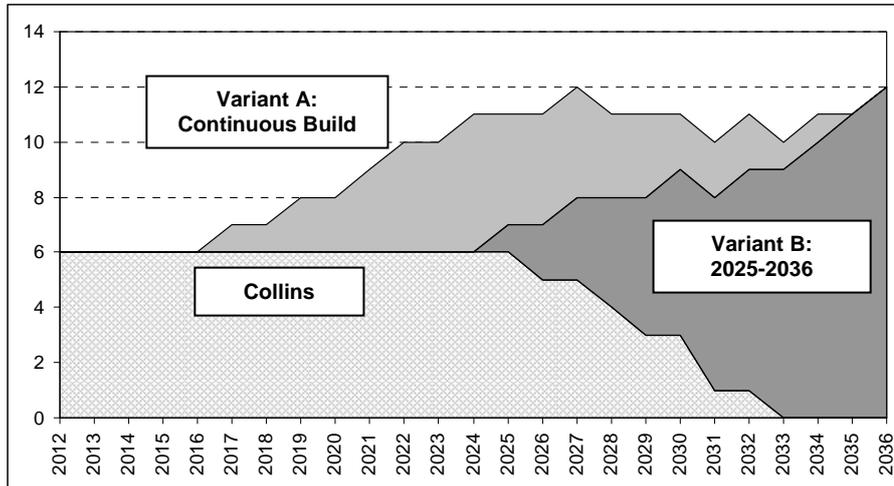
In terms of military capability, advantages of the continuous build system lie in the fact that despite the ageing of individual vessels, the capability of the whole fleet remains high and does not significantly diminish towards the end of the class lifetime, as under the current system. In addition, an ongoing construction programme would make it easier to increase (or, up to a point, also decrease) the overall fleet size in reaction to strategic circumstances. The fact that vessels would be sold off with some useful service life left also provides the possibility to compensate for combat attrition of major platforms, which is not available today.[66]

Figure 2 illustrates the consequences of a continuous build program for the Australian submarine fleet, which, to minimize project risk, should begin by producing additional Collins with the then-current subsystems of the 'old' boats. The first six boats took about 6-7 years from being laid down to commission, so that a new vessel could well enter the fleet by 2017. A fleet of 12 boats, which would stay in service for 20 years, could be maintained by

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of the Australian Parliament, March 2006, p. 15. This submission also demonstrates the advantages of a continuous build model in detail.

[66] Mothballing surplus boats may provide a capability for rapid replacement of losses, if additional crews would be available to replace those lost in combat. If that is not the case, the capability to accelerate ongoing production of new boats would probably be sufficient.

producing additional boats every 20 months.[67]   Even without schedule adjustments to either the build rate or the retirement of the original Collins, the overall fleet would reach 11 boats by 2024 (Variant A)—more than a decade before that level could be reached by a 'traditional' replacement of the Collins class (Variant B).

A somewhat similar picture emerges if the FFGs are not replaced by AWDs, but succeeded by the first ships of a continuously built surface combatant in the 4000 ton range, with a frigate and an OPV version, that would at a later stage also replace the ANZACs. Basing the new vessel, like the ANZACs, on the German MEKO system would provide commonalities with the current fleet. Due to its modular structure, it would also be easier to modify the design over time, and make it possible to benefit from improved components developed overseas. Figure 3 demonstrates that a program based on 20 month construction intervals and a 20 year lifetime, with the first ship being commissioned in 2018, could with only very minor adjustments to the ANZAC and FFG retirement schedules (not included in Figure 3) stabilize overall ship numbers around 10 vessels until well into the 2030s.

Figure 3: Frigate Replacement
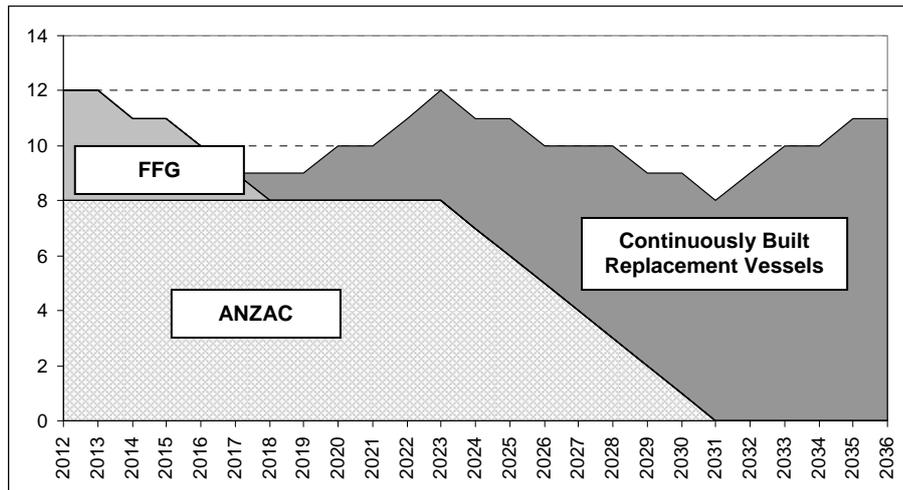
However, there is no compelling strategic reason for maintaining a continuous build of surface ships in Australia, as the required size is much less sensitive to deteriorations in Australia's strategic circumstances than that of the submarine fleet. There is a well developed world market for this type of vessel, and the case for a continuous buy would thus primarily rest

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[67] A continuous build system should be sustainable if the launch of each boat is not more than two years apart. Andrew Davies, *Keeping our heads below water: Australia's future submarine*, Policy Analysis, no. 16 (Canberra: ASPI, 2008), pp. 4-5.

on minimizing the cost penalty for a construction in Australia. Whether this is feasible in reality, given the small size of the fleet and the fact that the OPV variant, in particular, would be relatively quickly built, would require further study.

Table 1: Three Programmes Compared

		2014-2020	2021-2025	2026-2030	2031-2035
Status-quo Programme	Air Warfare Destroyers ($8bn for 3 vessels)	$8bn			
	Collins successor (6 x $2.5bn)		$2.5bn	$10bn	$2.5bn
	Submarine 10 year services ($0.5bn)	$2.5bn	$0.5bn		$0.5bn
	ANZAC successor (8 x $1bn)		$2bn	$5bn	$1bn
	TOTAL	*$10.5bn*	*$5bn*	*$15bn*	*$4bn*
Status Quo-Plus Programme	Air Warfare Destroyers ($8bn for 3 vessels)	$8bn			
	Collins successor (11 x $2.5bn)		$2.5bn	$12.5bn	$12.5bn
	Submarine 10 year services ($0.5bn)	$2.5bn	$0.5bn		$0.5bn
	ANZAC successor (8 x $1bn)		$2bn	$5bn	$1bn
	Sub-Total Investment	*$10.5bn*	*$5bn*	*$17.5bn*	*$14bn*
	Additional subs in active service ($70m/sub/year)			$0.35bn	$0.84bn
	TOTAL DIFFERENCE			*$2.85bn*	*$10.84bn*
Continuous Build Programme	New Submarines (11 by 2035, $2.5bn each)	$5bn	$7.5bn	$7.5bn	$7.5bn
	Submarine 10 year services ($0.5bn)	$2.5bn	$0.5bn	$1bn	$1.5bn
	OPV on New Frigate Hull (4 vessels, $0.5bn each)	$1bn	$1bn		
	New Frigate (7 by 2035, $1bn each)		$1bn	$3bn	$3bn
	Sub-Total Investment	*$8.5bn*	*$10bn*	*$11.5bn*	*$12bn*
	Additional subs in active service ($70m/sub/year)	$0.28bn	$1.26bn	$1.61bn	$1.4bn
	Less surface vessels in service ($70m/vessel/year)	($1.54bn)	($0.21bn)	($0.7bn)	($0.7bn)
	TOTAL DIFFERENCE	*($3.26bn)*	*$6.05bn*	*($2.59bn)*	*$8.7bn*

Note: All cost in constant dollars and estimates only. 10-year services include those for the current Collins fleet in 2015-2022. No learning curve effects included.

FINANCIAL IMPLICATIONS

Despite the cancellation of the AWD and LHD projects, the programme outlined above represents a significant increase in overall RAN capability over the current trajectory. How much would this additional capability set back the Australian taxpayer? Table 1 compares indicative costings for a perpetuation of the status quo, an increase of the submarine fleet at the end of the Collins class lifetime, and the revised programme with a continuous build of submarines and surface combatants.

The 'Status Quo' Programme includes the AWD, as well as the replacement of all Collins submarines and ANZAC frigates with similar ships by the end of their lifetimes. Because of the stop-start production cycles, investment varies widely with total expenditures of $10.5bn in 2014-20, $4.5bn in 2021-25, $13bn in 2026-30, and $3.5bn in 2031-35. The 'Status Quo-Plus' Programme replaces the Collins class with a total of 11 boats by 2035.

In the 'Continuous Build' Programme, the AWD and LHD are cancelled. Because of the need to replace the current amphibious ships and likely contract penalties, no consideration is made for any savings from the LHD programme, nor the reduced operating cost of ANZAC-size ships or OPVs compared with the larger and more capable AWDs. It is assumed that new submarines enter the force in 20 month intervals from 2017 (Figure 2). A new continuous production of surface vessels from 2018 is also included, beginning with four OPVs and then switching to a replacement frigate for the ANZAC based on the same hull.

The financial implications of this programme are due to two main factors: the smoothing of investment into the RAN fleet, and the difference in operations costs for the increased submarine fleet and de-creased surface fleet. As a result, the combination of total investment and change in operations costs[68] increases from $7.24bn in 2014-20 to $11.05bn in 2021-25 and stabilizes around $12.5 per five-year period after that. Compared with the 'Status Quo' Programme, this results in savings of $3.26bn in the first period (which could be used to reduce the strain put on the defence budget by the JSF buy at that time), additional expenditure of $6.05bn in 2021-25, savings of $2.59bn in 2026-30, and additional expenditure of $8.7bn in 2031-35.

While the 'Continuous Build' and the 'Status Quo-Plus' Programmes result in the same numbers of submarines and surface combatants in 2035, the number of available submarines increases much earlier in the former (see Figure 2). On average, an additional 2.66 submarines would be in service between 2018 and 2035. Between 2023 and 2028, the difference lies at a full 4 boats,[69] and the overall fleet will be much younger. The additional investment costs for the 'Status Quo-Plus' programme are concentrated in

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[68] Admittedly, a figure that is only meaningful in the context of this comparison.
[69] It peaks at 5 boats in 2025.

2026-2030 and, in particular, 2031-2036, when additional submarines would be build in a program of yearly builds spanning more than a decade. No such concentration of funding occurs in the 'Continuous Build' Programme, and the reductions in the size and capability of the surface fleet would over-compensate the operations cost of the additional 48 submarine years compared with the 'Status Quo-Plus' Programme, resulting in total savings of $4.79bn over the period.

The average additional cost of the 'Continuous Build Programme' over that of the 'Status Quo' amounts to $425m per year—before any learning cost savings from the increased submarine and frigate build are taken into account.[70] This is still a significant amount of money to ask for—but it is well within the scope of a re-ordering of priorities during the White Paper process, and within the Australian Government's ability to pay for the achievement of strategic objectives it has set for the ADF.

Conclusion

More than 20 years after the 1987 White Paper, there is an urgent need to put RAN force structure planning back on a sound strategic footing. This requires the development of a maritime strategy that takes Australia's particular geographic and strategic challenges into account. Australia should continue to be self-reliant in its own defence, and be able to form the core of a common defence force for South East Asia. Amphibious operations or very few high-capability surface combatants—which dominate the current building programme—are not suitable for this ambition. Hence, it is necessary to re-structure the RAN based on submarines, complemented by a mix of modestly capable surface combatants and OPVs that could be continuously built in Australia, or procured from overseas. Because the Collins have useful service life left, it is possible now to transition to a sustainable continuous build system that would provide strategic responsiveness for the future. The White Paper has a golden window of opportunity that will close soon, and not re-open for more than a generation. It should cancel the AWD, re-structure the amphibious ship programme, and start building submarines now.

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[70] A very conservative estimation with the help of the NASA learning curve calculator indicates that a 95% curve for a $2500m submarine would result in an average unit cost of $2190m for a six-ship buy, and an average cost of $2080m for a twelve ship buy, resulting in cumulative savings of $3.18bn or a full third of the yearly increase mentioned above. Additional savings might also be available from buying surface combatants from European yards. <http://cost.jsc.nasa.gov/learn.html> [Accessed 28 April 2008].