

Australia's strategic sting:

Maximising our future underwater warfare capability

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Retaining a strategic capability edge

If Australia is to maintain its regional capability edge in underwater warfare, avoid a capability gap and retain an effective undersea warfare capability, the first of class of a future submarine for the ADF must commence sea trials no later than 2022. Planning and initiation of long-lead activities, such as research and development (R&D), are now on the critical path to inform decisions to be taken in 2011 on technologies likely to be available for a contract let no later than 2016.

In the Australian context, no matter the weapon platform, key factors are always range and endurance. In the absence of a major and mature domestic nuclear engineering industry it is unlikely that Australia could maintain nuclear-powered vessels in our navy. Except for Russia, no country now builds long-range submarines that are not nuclear-powered.

The design, development and construction of Australia's future underwater warfare capability will therefore again be an Australian enterprise, as a developmental project with strong support from the USN and European submarine designers. But this time around, it will also be able to build on the hard-won and unique Collins pedigree.

To mitigate development risk, the combat, command, communications, intelligence and ship control systems of our current Collins class submarines need to be further developed, evolved and migrated into the future class of submarines.

Key messages arising from this situation are:

- the future underwater warfare capability project should be listed in the Defence Capability Plan in 2008;
- an extension of the Australia-US agreement on submarine co-operation to cover future underwater warfare capability is urgently required, noting that the extent of access to USN submarine technology and associated USN sensitivities will be a critical factor in the ADF acquisition strategy;

- bilateral government-to-government agreements with selected Western European conventional submarine design partners should also be negotiated urgently; and
- supporting studies and R&D projects with DSTO, industry and capability partners should be initiated as an early priority.

Some preliminary thoughts:

- A project team with the capacity to scope the issues, initiate the studies and contribute to Defence White Paper 2008 and other key Canberra-based processes is the most urgent requirement. Lateral solutions will be required to achieve this in a timely fashion. The Defence White Paper process should facilitate agreement on the top-level capability, acquisition strategy and timescales for the future underwater warfare capability.
- The process should not be used to delay initiating the immediate essential actions identified above.
- ASC should not be sold until the conditions necessary to access the critical submarine technologies are known and factored into the pre-conditions for sale.
- This process must also critically review the capability of the Collins Class to meet the requirements of the much more demanding environment of 2018–2031 whilst the transition to a new class of submarines is effected. This includes whether a major upgrade of the Collins class, such as the fitting of Air Independent Propulsion (AIP), or an earlier transition to the new class of submarines may be required.

General strategic setting

Without attempting to predict the precise shape of Australia's strategic environment in the period 2020-2050, it is already clear that there are powerful forces at work. These will determine both the strategic settings within which Australia will need to make its strategic choices and the boundaries within which Australia will seek to exercise its policy freedoms.

In the interests of brevity, Australia's overall strategic setting has been well covered publicly in *Defender* and in recent ASPI and Kokoda Foundation papers. Australia's long-term way of life, standard of living and economic success will remain largely dependent on seaborne trade over secure sea-lanes. Our major trading parties, such as the USA, China and Japan, share these characteristics.

Radicalised Islam will continue to mount a fundamental and violent challenge to the value system of liberal democratic societies using asymmetric force; Australia and western interests in South East Asia will continue to be targets. It is unlikely, however, to challenge our national survival or seriously degrade our economic security on its own.

China and India will emerge as major global and regional strategic players, exercising political, economic and strategic power in pursuit of their national objectives while at the same time constraining others in the pursuit of theirs. The centre of gravity of global economic power will continue in an easterly direction in the period of the strategic outlook so that, by 2050, it sits largely in South and East Asia.

A fierce global competition for resources will become an increasingly important strategic factor, particularly energy (both hydrocarbon and nuclear), key strategic minerals and water. China and India will compete in this domain with the industrialised nations – the USA, Japan and the members of the European Union – as well as the emerging industrialised nations such as the members of ASEAN, key South American nations such as Argentina, Brazil and Mexico, the emerging powers of the Middle East (particularly Iran) and Russia.

As canvassed in several recent articles in *Defender*, and in an October 2007 ASPI paper by Professor Michael Wesley, while Australia is well endowed with energy sources, the trend is heading from a *sensitivity to energy interruption* to one of *vulnerability* – increasingly serious economic and strategic vulnerability.

Increased importance of our maritime environment

Against this uncertain future strategic outlook, the maritime environment will become more significant in both economic and strategic terms. Sea Lines of Communication (SLOC), increasingly more critical for the economic and energy sinews of the global economy, will become more heavily populated and hence the vulnerability to commercial shipping (of all nations) will increase.

The maritime security environment will also become more demanding. The investment being made in maritime capability throughout the region will give states the capability to assert their maritime sovereignty rights, including in the undersea environment. The growing dependence on the sea for resources derived from it, or carried on it, will provide the stimulus to use this capability. Surface and sub-surface passage will be subject to legal and quasi-legal interference and constraint. In short, more countries will seek to practise undersea denial. There is also an increased probability that non-state actors will use various forms of sea denial, such as mine-laying.

Access for surface warships or military aircraft may become constrained in many circumstances. Submarines, on the other hand, are able to exploit their stealth and will continue to provide Governments with options in such scenarios.

Regional investment in submarines

Significant investment is underway by regional nations in order to acquire or improve their submarine capabilities. Modern Western European technologies are being fielded in many regional navies. India and China are also acquiring European and Russian submarine technology of considerable sophistication. Indonesia's program to acquire 10 Russian Kilo class submarines is the most recent example. By my reckoning, publicly available figures indicate that by 2025, there will be in excess of 130 modern submarines in our region (in addition to those of Australia and the USA).

These developments illustrate a near universal acknowledgement of the force multiplier effect of a modern submarine force. This especially applies to their ability to present such a real threat to a potential aggressor that a disproportionate effort to neutralise the threat is required.

Australia's need for a strategic sting

Former Defence strategic policy official, Allan Behm, recently used the term *decisive lethality* to describe Australia's need for the ability to deliver a decisive blow in its defence:

Australia's strategic problem is unique: how to manage the defence of 20 per cent of the earth's surface (including the EEZ) with 0.3 per cent of the world's population? The answer lies in good policies that reduce the prospects of war – strategic diplomacy – working in tandem with defence capabilities that are decisively lethal should they be employed. Such capabilities are not premised on weapons of mass destruction. But neither can they be premised on massive conventional capabilities, because Australia has neither the resources nor the people to develop and maintain them. Rather, decisive lethality is premised on tailor-made capabilities that Australia is uniquely able to develop and deploy, for which effective counter-measures exceed the capacity of possible adversaries. (Strategic Tides: Positioning Australia's Security Policy to 2050, Kokoda Foundation, 2007).

This attribute becomes all the more important given the struggle to access the increasingly scarce and critical resources outlined above, a significant portion of which reside under Australia's control.

A strategic sting is designed to make an aggressor avoid a military confrontation with Australia. As a submariner, let me explain why Australia's future underwater warfare capability constitutes this type of critical strategic sting and, indeed, is the only capability in our defence force able to do so.

Only a submarine

A submarine's unique capabilities of stealth, long range and endurance allow it access in key areas denied to other weapons platforms. This will be critical in the strategic scenarios ahead of us. Other weapons platforms can do parts of these missions; none offers the covert combination of capabilities of the submarine. In terms of its force element groups, submarines are the Special Forces of the Navy, operating far behind traditional front lines, independently observing and reporting and, where appropriate, striking lethally at key points when least expected.

The correct investment strategy in a future submarine force will confer a significant strategic deterrent capability on Australia. This can be measured not only in defence force terms but also in contributing to the security of our energy supplies.

A significant factor in the deterrent value of long-range submarines is the exorbitant and disproportionate cost involved in trying to counter a capable submarine force. This includes the degree of doubt engendered that, regardless of the investment, whether the defensive or offensive ASW effort can succeed. This is a significant strategic return on investment.

The future strategic setting outlined above will result in a reinforcement of existing roles and an expanded range of strategic effects that can be achieved by Australia's submarine force. These new or modified strategic effects expand the roles required of the future underwater warfare capability beyond those currently expected of the Collins class force.

Let me briefly discuss the most critical. I preface these points by emphasising the importance of good operational command, control and real-time intelligence support to maximise the effect of submarine operations.

Surveillance and intelligence gathering. The ability to gain access to areas denied to other units, combined with the ability to concurrently observe activities underwater, on the surface, in the air and over the electromagnetic spectrum, are particular strengths of the submarine. Combined with the ability to fuse and interpret the observations, and react immediately to maximise the opportunities for further collection against, and understanding of, the activities concerned, these make a submarine a unique platform for this role.

The information provided will contribute to allied and Australian knowledge, enabling us to gauge intentions, deploy diplomatic and military preparations and, in the event of a contingency, position our limited military capability for maximum effect.

Land strike. A submarine fitted with land-attack cruise missiles is able to position within launch range without alerting the adversary, withdraw quietly if not required, or launch on order and withdraw without provoking or offering an opportunity for further or escalated engagement.

While suitable land-strike cruise missiles can be carried in combination with other weapons such as torpedoes, mines and anti-ship missiles, this direct land attack role requires a profile from the submarine that is incompatible with roles requiring a more proactive stance, a factor when force structure is being considered.

Battlespace preparation. A submarine has the ability to gain access to denied areas covertly, assess the environment and deployment of opposing forces without alerting the opponent, and relay this back in order to allow future maritime task force, air or seaborne operations in the area. This makes the submarine a preferred option for effective battle space preparation.

With suitable capabilities embarked, the submarine is able to identify and neutralise threats prior to a coalition task force or shipping convoy moving into an area. Once such a task force operation is underway, the submarine is able to provide direct support (noting that a conventional submarine lacks the mobility to support a rapidly moving task force — but is able to do so for short periods or in key geographical areas, thus requiring more than one submarine deployed along the line of advance).

Anti-submarine warfare. The mirror image of this capability is the challenge posed by the growth in regional submarine capabilities. Australian submarines are arguably Australia's most potent anti-submarine weapon and this is their most demanding role. This capability is enhanced by the optimised sensor suite possessed by a submarine compared with all other ASW platforms. Maintaining an edge across the spectrum of stealth, sensors, weapons, countermeasures and training is critical to success — an ongoing investment in R&D and programs to continually upgrade capabilities in all these areas is the price of a viable capability.

Where practicable our submarines should operate as part of an ASW network. However, there are many likely contingencies where we will lack sufficient sea and air control to permit the deployment of surface and air ASW assets.

ASW by submarines is a very challenging role. It must be supported by a R&D effort that achieves a technology edge, and current and accurate intelligence, and be executed by the most capable command and control support. These will be the difference between success and failure and all aspects of the underwater capability must be sustained and focused to achieve this. Despite all these efforts to ensure a winning edge, the margin between success and failure is small and attrition of our own submarines must be anticipated. This reality and the relatively low mobility of conventional submarines are key force structure considerations.

Network contributor with unique abilities. The submarine's ability to gain access to critical denied areas allows it to make a unique contribution to the overall network of systems. The technical challenge is to do so without compromising the submarine's covert stance. Off-board vehicles and low probability of interception communications channels are some of the tools to achieve this.

Extended-range Special Forces operations. Given future strategic settings and the trend for asymmetrical conflict, submarine-borne Special Forces operations at extended ranges are likely to be a growth area for the future underwater warfare capability. Exploiting the submarine's ability to covertly transport, launch and recover Special Forces elements, provide command and control and, if necessary, a level of tactical fire support, will be a significant design driver. It is also likely to require the fitting of additional weapons capabilities, such as short-range, tactical land-strike and AAW missiles.

Offensive mining. Mining using sophisticated, discriminating mines or mobile mines where necessary, will enable us to deny or impede access to selected areas or ports not under our sea or air control. Depending on the situation, these can be declared – leaving the choice to the adversary whether or not he wishes to challenge the mine. Mines can be laid in areas inaccessible to other units and activated on command, if necessary, by the submarine.

Unmanned vehicles. Unmanned underwater vehicles and unmanned aerial vehicles are force multipliers that will extend the manned submarines' reach, effectiveness and survivability. Remote sensors deployed or carried by an unmanned vehicle could offer a winning advantage to the larger Australian submarine in an ASW encounter with the smaller submarines proliferating in the region. These vehicles are a key component of a future underwater warfare capability. They should be considered an integral part of the overall project. It is a major area for R&D and a design driver for Australia's future submarine capability.

Force structure considerations

In considering Australia's strategic setting and our geographical area of interest, it is likely that Australia will wish to maintain submarines concurrently at very long ranges (over 3000 nautical miles) in the critical roles of surveillance, intelligence gathering, indications and warning and, in the event of a contingency, land strike. Concurrently Australia will also wish to provide submarines in support of maritime-based task force operations or for Special Forces missions closer to home (2-2500 nautical miles), and to train our own anti-submarine warfare forces – a key requirement in a contingency.

The issue of concurrent roles and allowance for attrition of our own submarines employed on offensive operations are additional factors in the calculation of the force structure required to achieve the appropriate strategic effects. As Dr Andrew Davies correctly concludes in his recent ASPI paper, *Keeping our heads below the water: Australia's future submarine*, size and numbers count. From a force of six submarines only 70 per cent (3-4) will be operational on a given day. This is unlikely to meet future requirements nor does it provide the impact required for a real and sustained strategic sting.

The strategic setting and the additional roles and effects to be delivered by the future submarine capability point towards an increase in the size of the ADF's submarine force. The reaction of some to this proposal is to suggest this can only be achieved at the expense of the surface fleet or other major defence force capabilities.

I disagree; the Defence White Paper process now underway is the legitimate process for agreeing the top level capability and the military effects to be achieved by future submarine and surface forces. If this concludes that a larger submarine force is required then the government will have to make a decision based on the national interest and national capacity as to what can be afforded. They should do so in the full knowledge of what is required. We should not pull our punches in the analysis phase or prejudice what the Government's decision may be.

The inference is that if the Navy adopts a replacement mindset, and settles for six or maybe fewer submarines, then there will be more funds available and an easier argument for the replacement of surface ships. This belief is misplaced.

The proposed Defence White Paper provides an excellent opportunity to consider these issues and identify the top level requirement for the future submarine capability. However, there is much to be done in the lead up to this project and limited time in which to do it. It could be a serious mistake to await the outcomes of Defence White Paper 2008 before initiating the long-lead activities.

Some conclusions

No serious strategic commentator in Australia doubts that we should maintain a significant future underwater warfare capability. The only real debate is how, and at what direct and foregone expense.

The strategic environment of 2020–2050 demands an advanced underwater warfare capability, centred on a long-range, sophisticated submarine backed by a through-life R&D-based improvement program to achieve and maintain a qualitative edge.

The Collins class submarines start to reach the end of their 30-year hull life in 2025. The likelihood of significant strategic discontinuities, and major shifts in global power balances over the next four decades, create a compelling case for the acquisition of a new and expanded undersea warfare capability to ensure there is no capability gap as the Collins class boats are retired.

Moreover, the capacity of Collins class submarines to deliver the required capability in the transition period 2018–2031 needs critical examination.

Compared with our Collins class submarines the future underwater warfare capability will be required to operate in a more demanding environment, at greater range and to achieve an expanded number of strategic effects. The underwater warfare capability will be a critical and unique asset in Australia's defence capability; providing the *strategic sting* to deter 'would be' aggressors and if necessary causing them to desist from aggressive actions.

It will also provide an increasingly important contribution to our US alliance obligations.

The strategic effects, consequent roles, the need for concurrency and an allowance for attrition should be factored into force structure considerations. The preparation of Defence White Paper 2008 offers an opportunity to set the top level capability, not an excuse for delay in initiating the long-lead activities.

In a subsequent article I will consider some of the issues arising from the acquisition of a future submarine capability. This will include design issues, lessons learnt from building and operating the Collins class, industry issues and personnel matters. ♦

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