Maximising Strategic Options in Constrained Strategic Circumstances:

The Future Underwater Warfare Capability

Australia's Strategic Sting

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CN thank you for the opportunity to present the Submarine Institute of Australia's perspective on Australia's Future Underwater Warfare Capability.

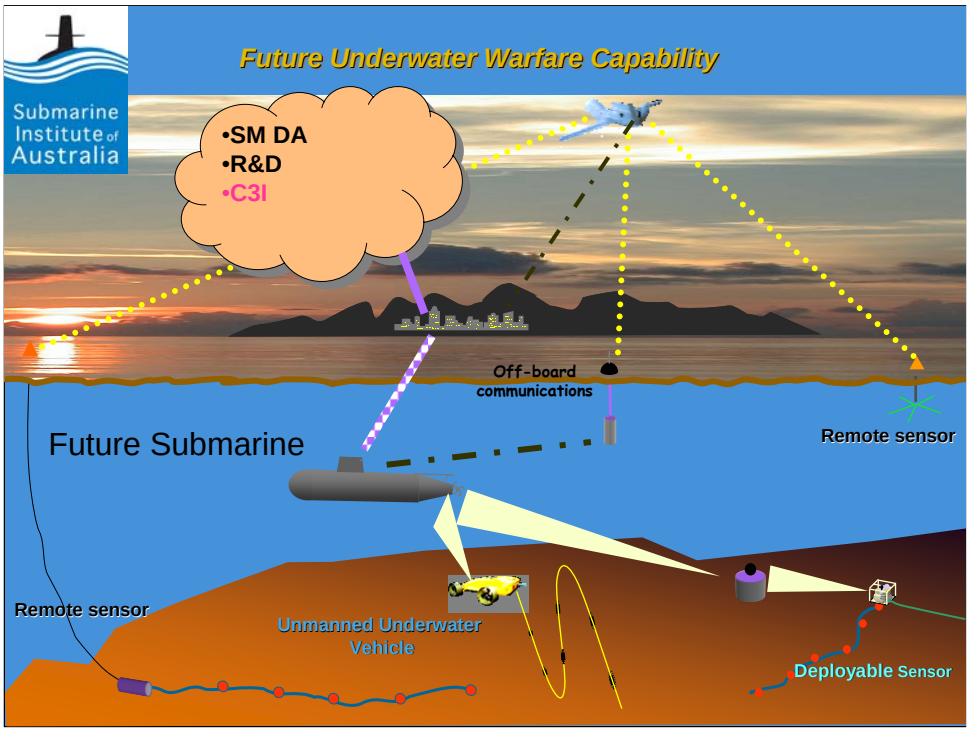
•To you, Vice Admiral Tripovitch and the senior RAN and DoD officers present I would argue this capability is the critical legacy you will leave behind you.

•For the junior naval officers present from whom the CN of 2030 will be drawn - this project will decide whether you are able to offer the Australian Government options to deal with a major regional power struggle – does Australia have a Strategic Sting (Mouse) to cope with a region dominated by 2 economic giants wielding influence and power backed by modern, highly capable conventional and nuclear powered submarine forces , or is the RAN with its AWDs and LPHs to be severely confined in its ability to deploy?

•For the scientists, engineers and innovators of industry it is the opportunity to achieve new levels of technology, Australian Industry participation, leadership and growth to leverage off a national investment in your capability – on a scale not seen since the Collins project.

•To all – it is the chance to make a difference where it counts – something that drives the Institute's fervent advocacy for this critical capability over the past 4 years.

I will draw my remarks from a paper of the same name, I have had to



At the centre of this capability is a future (manned) submarine, supported by 3 foundation blocks:

•An indigenous, through life, submarine design and R&D capability;

•A variety of other systems, including unmanned underwater, unmanned aerial vehicles; and

•A dynamic command, control and intelligence system.

I will use the terms ‘future submarine’ and ‘future underwater warfare capability’ to distinguish between the submarine component and the overall capability.

Outline

- Australia's strategic circumstances.
- Capability and Roles:
  - What is it that *ONLY* submarines can do?
  - What is it that submarines do better?
- Force Structure considerations.
- Conclusions on Design, Industry issues.

Top Level Conclusions & Key Messages

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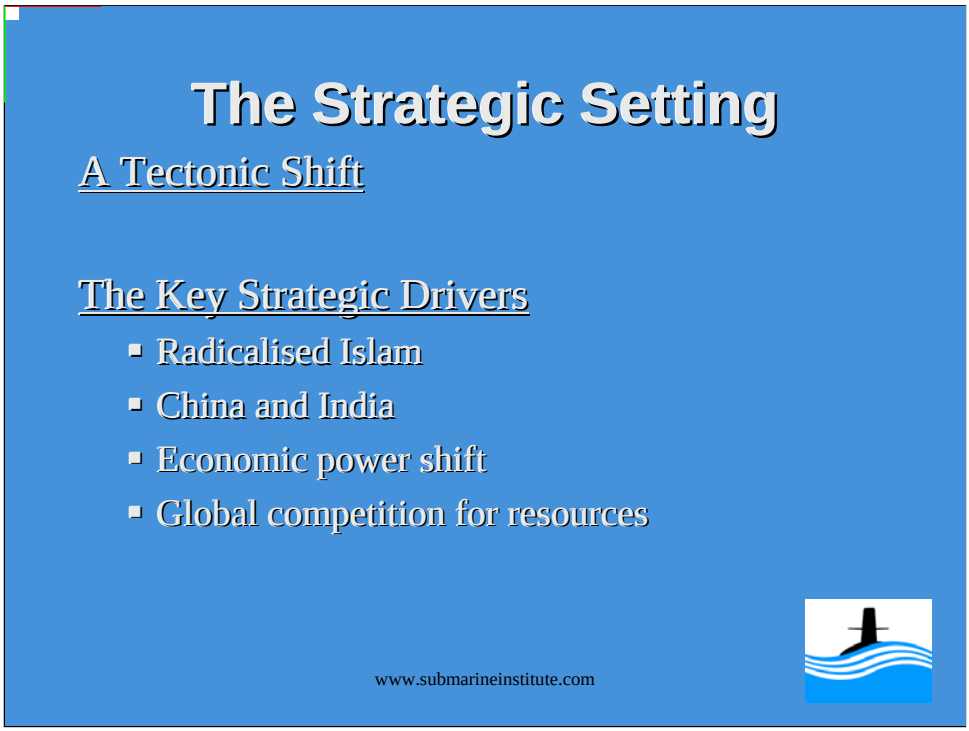
In my allotted 30 minutes I will cover the topic in 4 sections, before drawing some conclusions.

I will be happy to take questions on completion.



My first section, the Strategic Setting is the critical starting point and frames all our considerations about the Future Underwater Warfare Capability. I will discuss the key strategic drivers only briefly.

1. A Tectonic Shift

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 that 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. I quote Dr Mark Thomson, ASPI speaking on Defence Challenges for The Next Government 12 November 2007:

"The rise of both India and China, the re-emergence of Japan as a strategic actor, and the uncertain future role of the United States, are all shifting the ground beneath our feet."

2. This is not a business as usual outlook; overall, the prospects for global peace and stability are gloomy: the convergence of ideological extremism driven by fundamentalist Islam and significant changes in global power balances indicate major strategic discontinuities.

3. Let me say something about the Economic Power Shift

The centre of gravity of global economic power will continue to move in an easterly direction, by 2050, it will sit largely on the Indo-Chinese border.

The political, economic and strategic reach of the US will, in relative terms, reduce. While it will remain the wealthiest nation in *per capita* GDP terms, the balance of power between the US and its competitors will shift, and the US will no longer enjoy the freedom of action that accompanied its status as the sole superpower.

With China, India, and Indonesia having economies approximately 30, 20 and 3 times bigger respectively than that of Australia, our global strategic environment will be fundamentally different from that of 2008.

4. Global Competition for Resources

A fierce global competition for resources will become an increasingly important strategic factor, particularly energy (both hydrocarbon and nuclear), key strategic minerals and water.

Increased Importance of the Maritime Environment

1. Ross Babbage in his recent paper Australia's Future Underwater Operations and Systems Requirements, Kokoda Papers April 2007 concludes that:

"The value of international trade flowing through this region will more than double by 2020, and possibly triple by 2030 ….. the number of ships sailings in this region will more than double"
The maritime security environment will also become more demanding. The investment being made in maritime capability throughout the region will give nations the capability to assert their maritime sovereignty rights, including in the undersea environment.

Access for surface warships or military aircraft may become constrained in many circumstances.

2. Regional investment In SM Capability

Significant investment is underway by regional nations to acquire or improve their submarine capability. Modern Western European technologies are being fielded in many of these capabilities. India and China are 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 US).

3. Strategic Sting

Allan Behm has coined 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% of the earth's surface (including the EEZ) with 0.3% 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.' **[1]***

This attribute becomes all the more important given the struggle to access the increasingly scarce and critical resources, ***a significant portion of which reside under Australia's control.***
[1] Strategic Tides – Positioning Australia's Security Policy to 2050, Allan Behm, Kokoda Foundation

The submarine's unique combination of stealth, long range and endurance that allow it access in key areas denied to other platforms will be critical in the scenario ahead of us. Other platforms can do parts of these missions; none offers the covert combination of capabilities of the submarine.

1. Deterrence

The correct investment strategy in a future submarine force will confer a significant strategic deterrent capability for Australia, not only measured in Defence terms but also contributing to the security of energy supply.

A significant factor in the deterrent value is the disproportionate cost involved in trying to counter a capable submarine force and the degree of doubt that exists that, regardless of the investment, the ASW effort can succeed. Some commentators cite an investment ratio of greater than 100:1: every $ spent on a submarine capability requires at least $100 to counter and the desired outcome can by no means be guaranteed. This is a significant strategic return on investment.

2. Surveillance & Intelligence Gathering

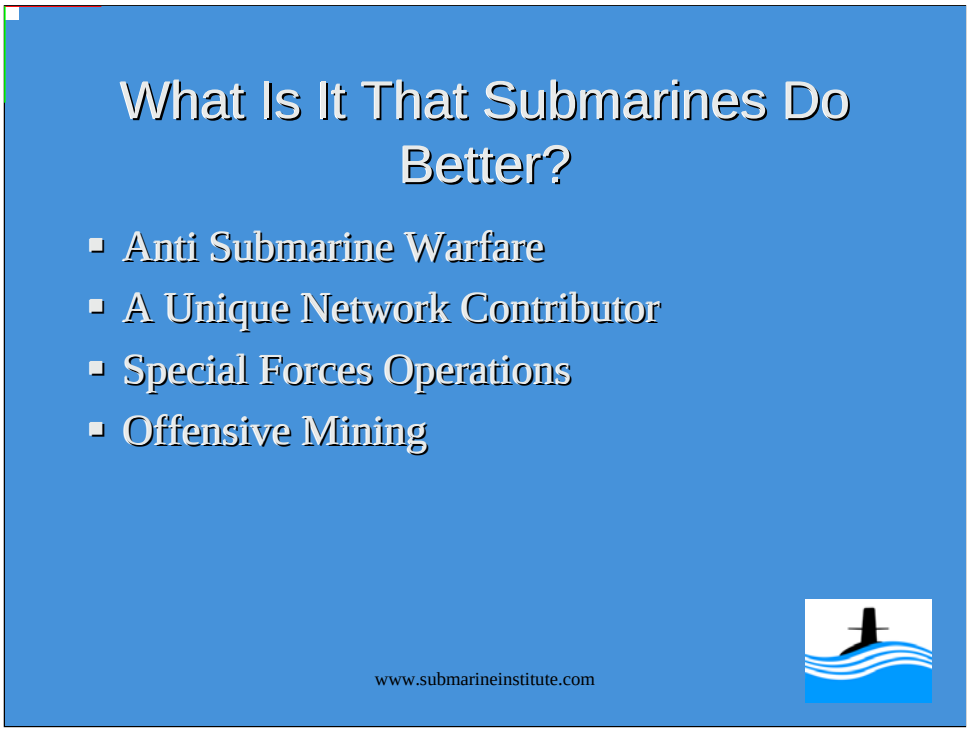
The ability to gain access to areas denied to other units, combined with the SM's ability to concurrently observe activities underwater, on the surface, in the air and over the electromagnetic spectrum, are particular strengths. Combined with the ability to fuse and interpret the observations and react immediately to maximise the opportunities for further collection and understanding the activities makes a submarine a unique platform for this role.

3. 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 instruction and withdraw without provoking or offering an opportunity for a further engagement.

4. Battle Space Preparation

The submarine's ability covertly to gain access to the denied areas, assess the environment and deployment of opposing forces, without alerting the opponent and relay advice on the situation back in order to allow future task force operations in the area, make it a preferred option for battle space preparation.



1. Anti Submarine Warfare

Australian submarines are arguably our most potent anti-submarine weapon: 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.

2. A Network Contributor With Unique Abilities

The submarines ability to gain access to critical, denied areas allows it to make it a unique contribution to the network.

3. Expanded Range of Special Forces Operations

Given the strategic setting and trend for asymmetrical conflict, this is likely to be a growth area for the future underwater warfare capability. Exploiting the submarine's ability to covertly transport, launch and recover the Special Forces and their equipments, provide command and control and if necessary, a level of tactical fire support will be a significant design driver

4. Offensive Mining

Mining using sophisticated, discriminating mines or mobile mines where necessary will enable us to deny access to selected areas or ports not under our sea or air control. Depending on the situation, the mines can be declared, leaving the choice to the adversary whether or not he wishes to challenge the mine!

My 3rd section is the Force Structure considerations

1. Top Level Capability

This is a key question to be addressed in the White Paper process. It is a simple, measurable, expression of the capability Australia requires of its submarine force. In the case of the Collins project it was:

To maintain 2 submarines on patrol at 2,500 nm.

In considering the strategic setting and our geographical area of interest, our suggestion as a starting point for the debate is that Australia will wish to be able to maintain at least 2 submarines at very long ranges (>3,000 nm) 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 at least 2 submarines in support of Task Force operations or for special force missions closer to home (2- 2,500 nm) and train own ASW forces.

The issue of concurrent roles and allowance for attrition of own submarines employed on offensive operations are additional factors to the calculation of the force structure required to achieve the strategic effects.

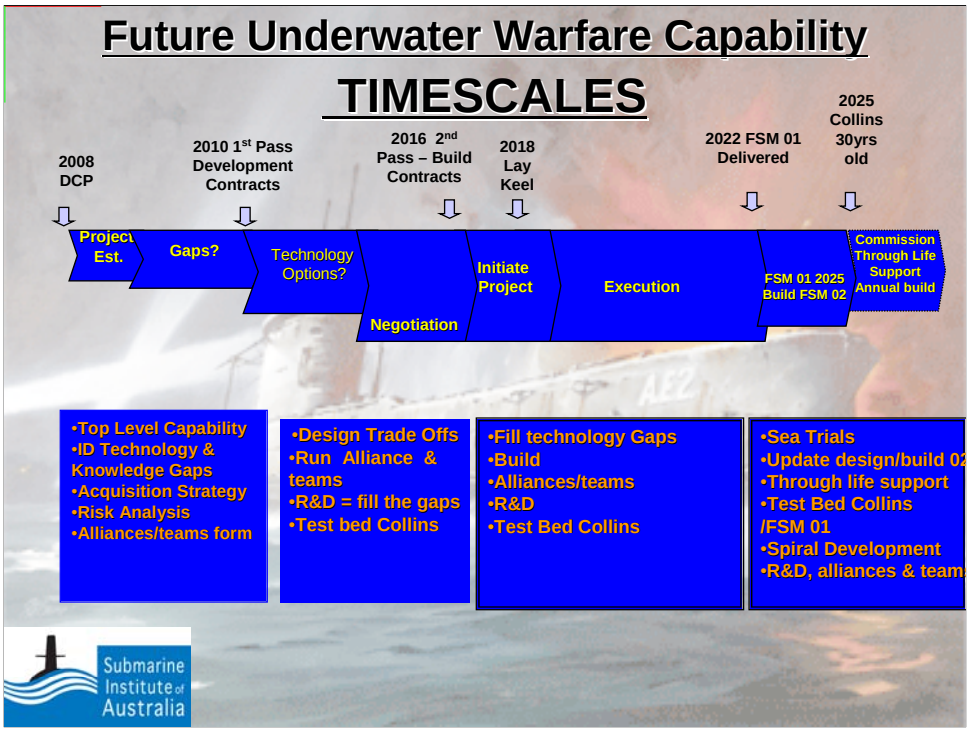
I would be happy to address the rationale for at least 2 vice 1 in question time.

3. The Defence White Paper – An Opportunity, Not An Excuse

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

4. What Our Alliance Partner Expects of Australia's Submarine Force

In view of the democratic and liberal values that both Australia and the US share, the Australia-US alliance will remain a core feature of our strategy. Arguably, the US will place an increasingly high priority on Australia's capacity to provide a capable conventional submarine force as a contribution to that alliance.



1. In the 2 years from DCP listing until First Pass in 2010 we need to:

- Agree the Top Level Capability
- ID Technology &
- Knowledge Gaps
- Agree the Acquisition Strategy
- Backed by the appropriate Risk Analysis
- Form the Alliances/teams to conduct the project

2. Following First Pass in 2010 we will have a 5 year period to:

- Design Trade Offs
- Run Alliance & teams
- R&D = fill the gaps
- Test bed Collins

Before letting the construction contract in 2016

3. This will mobilise the industry capability for the 6 years allowed to undertake the design and construction of FSM 01:

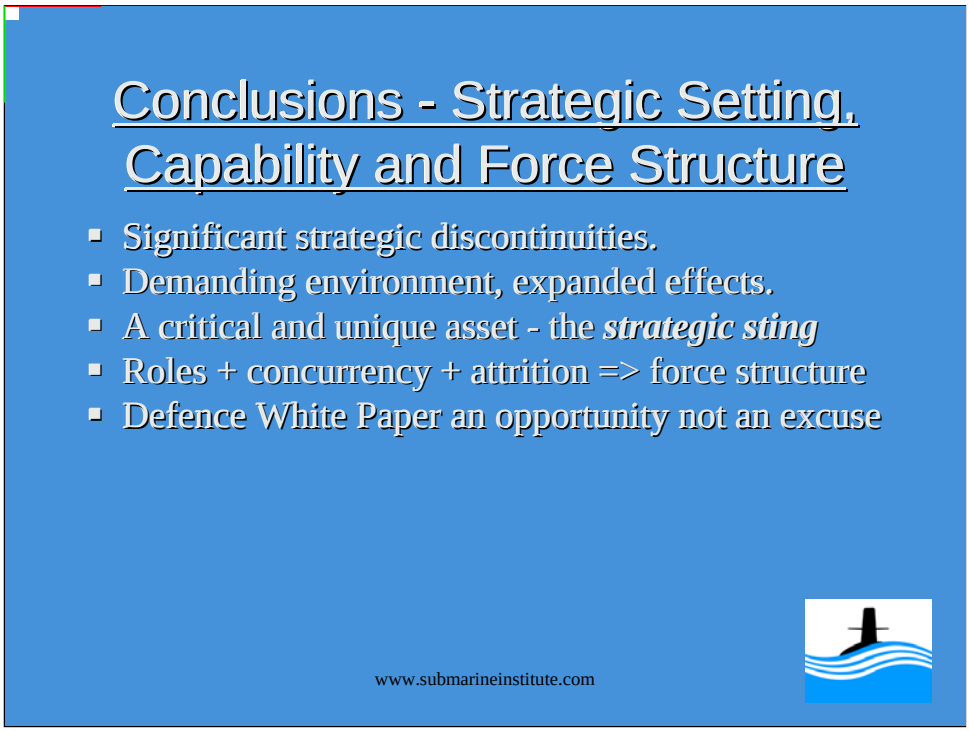
- Fill technology Gaps
- Build
- Alliances/teams
- R&D
- Test Bed Collins

4. The delivery of FSM 01 in 2022 will allow 3 years for:

- Sea Trials
- Update design/build 02
- Through life support
- Test Bed Collins and FSM 01
- Spiral Development
- R&D, alliances & teams

By 2025 FSM 01 must Commissions and be operational, ready to relieve the first Collins – by which time the latter is 30 years old and obsolete.

In case you are wondering about the background that is a painting by Phil Belbin of AE2, the RAN's first warship lost in battle and the first Allied submarine to penetrate the Dardanelles on 25 April 1915 – an early example of the strategic impact of submarines – I would be happy to elaborate on the lessons for tomorrow's Navy if anyone is silly enough to ask me.



Conclusions on the Strategic Setting, Capability and Force Structure Considerations

1. The likelihood of significant strategic discontinuities and major shifts in global power balance over the next four decades create a compelling case for the acquisition of a new and expanded undersea warfare capability.

2. The strategic environment will demand 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;

3. The underwater warfare capability will be a critical and unique asset in the nation's Defence capability; deterring 'would be' aggressors and should this fail, providing the ***strategic sting*** to convince them to try another approach.

4. The strategic effects, consequent roles, the need for concurrency and an allowance for attrition should be factored into force structure considerations; and

5. The Defence White Paper offers an opportunity to set the top level capability, not an excuse for delay in initiating the long-lead activities.

There are many design issues which my time limit constrains me from mentioning, but I would be happy to amplify in question time.

Some Conclusions On Design Issues

1. Australia should build on the capacity established by the Collins project to design and build the future submarine.

Given the importance of a submarine capability as a core defence requirement for Australia beyond 2020, Australia's regional pre-eminence as a designer, builder and operator of submarines is a comparative regional advantage; it should be maintained as a matter of strategic priority.

'Australia is currently one of the few countries to have mastered advanced defence operations in the underwater environment ….. cannot readily be matched or countered by most potential adversaries …in many future defence contingencies, this competitive advantage would be extremely useful and in some is likely to prove decisive'. [1]

[1] Australia's Future Underwater Operations and Systems Requirement, Ross Babbage, Kokoda Paper, April 2007, p 3.

2. It is a unique requirement

3. COLLINS can be used as a test bed to reduce the risk of introducing new technologies for the future submarine; although the impact of current severe manpower shortages impact on this.

4. Time is tight, early agreement on the acquisition strategy and initiation of studies and R&D is now critical. The capability leap we are seeking will require considerable investment in R&D, coordinated between DSTO, Industry and capability partners – I would be happy to elaborate in question time.

Some Conclusions on Industry Issues

1. Global Marketplace

The global marketplace for submarine construction has undergone considerable consolidation in recent years particularly in the UK, Germany and US. While a number of countries construct submarines under licence, only Germany, Russia, France and most recently, Spain are active in the export market. None of the western suppliers are building a submarine that meets the capability required of the future submarine for Australia.

2. Commitment To the Australian Shipbuilding Industry

Recognition and commitment by government of the strategic importance of the naval shipbuilding industry and relevant industry at large has given the industry greater confidence in its future and should encourage investment in its workforce, facilities and innovation. We enjoy a much stronger starting point than we did with Collins.

3. Competitive Teaming for Efficiency

In addition to the design support provided by the US and European designers, competitive teaming through commercial alliances between overseas suppliers and local industry for the supply of systems and components offers the best prospect of ensuring efficient Australian construction.

Early selection of industry partners may be required where substantial development of the system is required in order to meet the requirement and to encourage mutual investment and sharing of risks.

4. ASC is the low risk design authority and builder.

The future ownership of ASC must facilitate access to submarine IP.

•This is a complex and sensitive issue.

In our opinion we should not rush the sale process; it is important to 'get it right'. The ground rules for accessing the critical IP should be fully understood and complied with as a pre condition of the sale. We would also get full value for ASC if it were sold with the future submarine project on the books.

Top Level Conclusions

1. To avoid a capability gap and retain an effective undersea warfare capability the future submarine must commence sea trials in 2022.

2. Planning and initiation of long lead activities such as R&D are now on the critical path to inform decisions to be taken in 2010 on technologies likely to be available when the contract is let in 2016.

3. To mitigate development risk, the Collins combat and ship control systems need to be developed, evolved and migrated into the future SM.

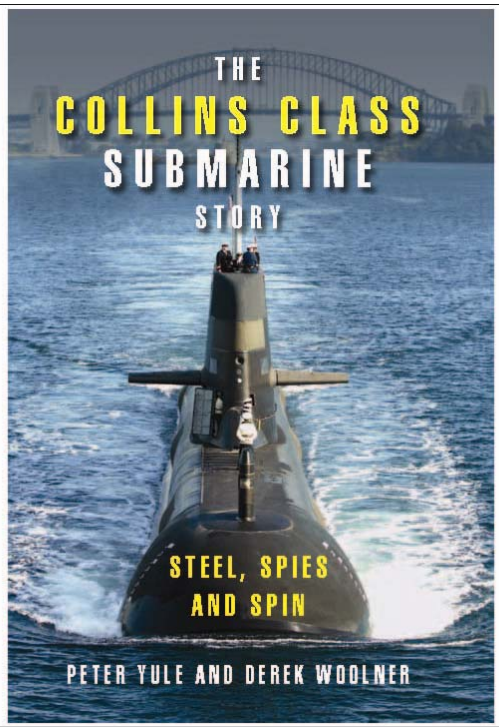
4. The design, development and construction of the future underwater warfare capability will be a uniquely Australian enterprise, with strong support from the USN and European submarine designers.

5. The shortages of skilled personnel in Defence and Navy to oversee the project are a significant limitation and must be factored into the acquisition strategy; and

A sustained, priority allocation of the RAN's scarce manpower will be required to recover from the current shortfall, sustain the project and transition into the future submarine.

6. It should be a developmental project based on the Collins pedigree; Collins was the last developmental project undertaken by Defence.

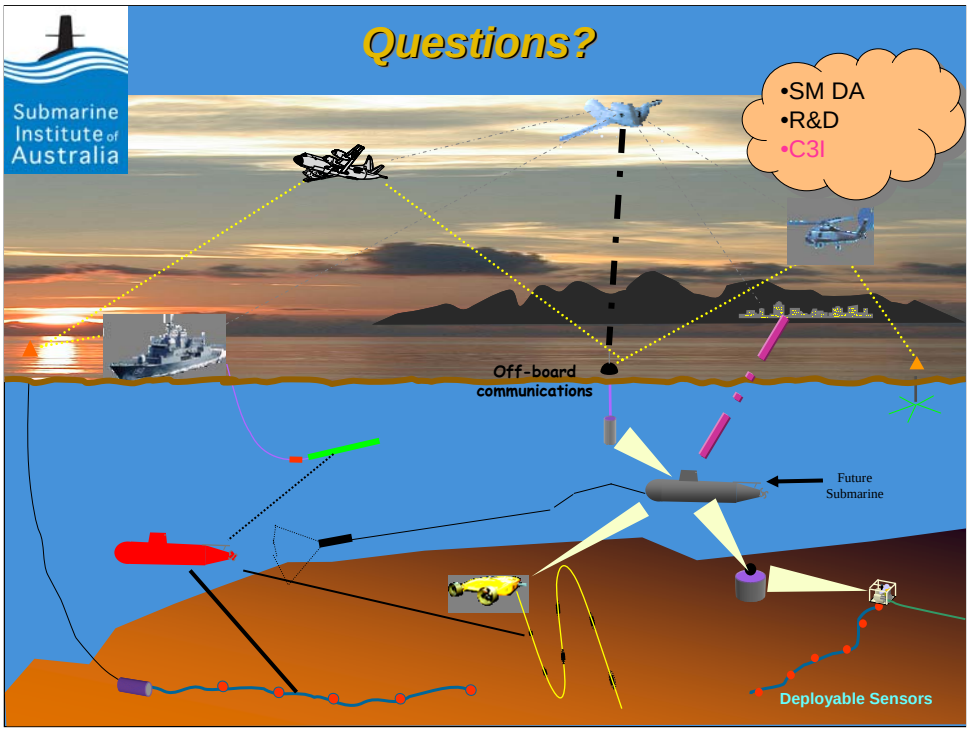
•Dr Peter Yule and Derek Woolner's book on the project to be released in April this year provides a timely account of the lessons good and bad learnt from this project.



I like one of the earlier version of this title better – Steel, Spies, Spin and Sin. Somewhere in the process Spin displaced Sin.

Key Messages

1. The future underwater warfare capability project should be listed in the DCP in 2008.
2. An extension of the Australia/US agreement on submarine cooperation 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 the acquisition strategy.
3. Bilateral government to government agreements with selected Western European conventional submarine design partners should also be negotiated urgently.
4. Supporting studies and R&D projects with DSTO, industry and capability partners should be initiated as an early priority.
5. **A project team with the capacity to scope the issues, initiate the studies, contribute to the Defence White Paper and other key Canberra-based processes is the most urgent requirement.**
6. The Defence White Paper process should facilitate agreement on the Top Level Capability, acquisition strategy and timescales for the future underwater warfare capability.
7. The process should not be used to delay initiating the immediate, essential actions identified above.
8. ASC should not be sold until the conditions necessary to access the critical SM technologies are factored into its sale arrangements.



Before taking your questions I would like to leave you with some questions of my own:

•The challenge is in front of us all – does the senior leadership have the capacity to look ahead, past the bends appearing in the strategic road in front of us and, resisting the temptation to simply look in the rear view mirror, accept the need to change the balance of the current Navy in order to provide the strategic sting required?

•What options will the RAN of 2030 offer Government against the strategic backdrop we see unfolding?

•Can DSTO, Industry and Defence join with their overseas partners to deliver the capability that Australia needs?

•Do we all - politicians, industry, Defence and Navy have the necessary persistence and grit to tackle the hard yards of a developmental project to deliver it?

The Submarine Institute stands ready to work with you all, Navy, Defence, DSTO and Industry to deliver this critical capability.

Backup Slides

- The Key Design Drivers 1.ppt
- R&D Topics I of II.ppt
- Design Issues - Unmanned Vehicles In The Future.ppt
- Why ‘At Least 2 SM’.ppt

The Key Design Drivers

- Stealth.
- Mobility, Range and endurance.
- Payload = weapons + c-measures + UUV/UAV.
- Sensors and connectivity.
- Manning.
- Handling characteristics.
- Supportability and growth potential.

R&D Topics I

- Materials.
- Hull.
- Batteries.
- Air Independent Propulsion systems.
- Propellers/propulsors.
- Life support systems.

R&D Topics II

- Unmanned vehicles.
- Signature reduction.
- Countermeasures.
- Combat system and sensors.
- C3I technologies.
- Ship control.

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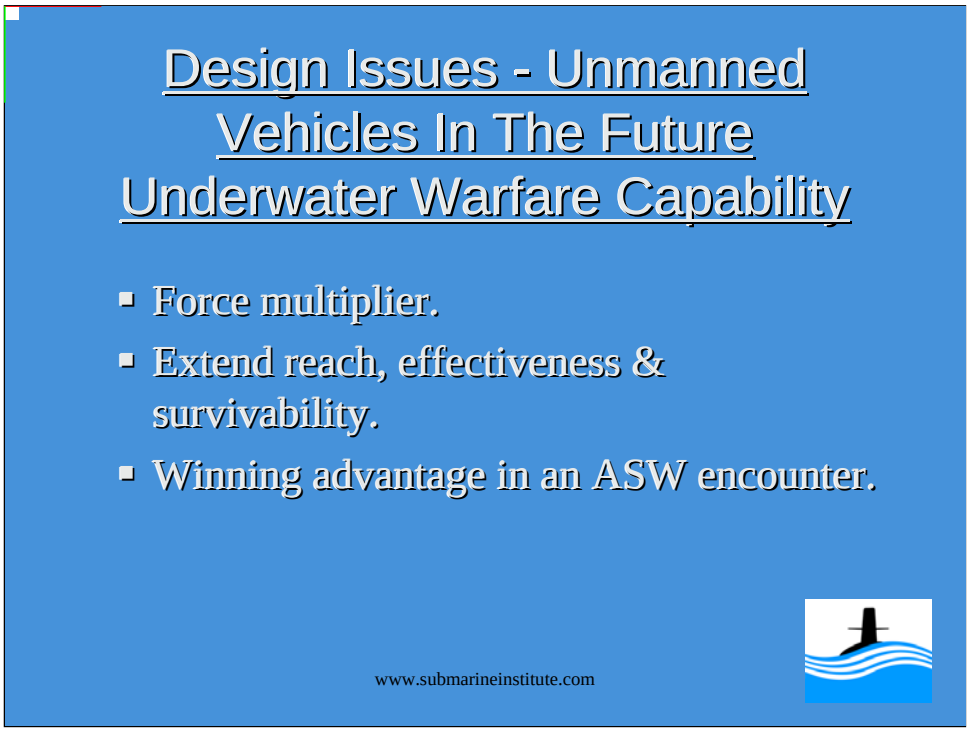

One new area of particular importance is unmanned underwater and aerial vehicles – these are a force multiplier that will extend the future submarines reach, effectiveness and survivability.

Remote sensors deployed or carried by an unmanned vehicle could offer a winning advantage in an ASW encounter.

Conventional submarines lack the mobility to quickly redeploy over long distances to a new patrol area once on station. The capacity to deploy at least 2 SM doubles the opportunities that we will have a SM in the right place at the right time.

In all scenarios there are more than one key area to be monitored or covered. The role also determines where the SM is deployed, eg where a SM is deployed on a land strike mission it is likely to be deliberately positioned clear of high areas of activity.

Countering a SM force able to maintain at least 2 SM on station is significantly more than double the problem – recall my return on investment point – I would argue for a square law, ie two SM are 4 times the problem of one

In the event that the SM is localised either by searching forces or its own actions there remains great uncertainty about where the remainder are. It is much easier to 'count heads' if the force against you is small and only capable of sustaining 1 on station.