

## TURNING FULL CIRCLE

# Twist in naval shipbuilding policy takes short route to the 'Lexcen'

■ Trevor J Thomas/JERVIS BAY

Not that long ago (just over 25 years), the key elements of Australia's major naval warship construction capability centred upon the Cockatoo Island & Garden Island dockyards in Sydney, and Victoria's 'Williamstown' naval dockyard in Melbourne. A remnant of the necessity for safe harbour to support allied combatants during World War II also survived at Brisbane's Cairncross yard, with a dry-dock principally suited for repairing cruisers and destroyers.

Subsequent to the decision to revitalise 'Williamstown' in the late-1970s by way of a partial guided missile frigate (FFG) build, and latterly, the 10-ship 'Anzac' frigate program – along with construction of a greenfields site at Osborne in South Australia to effect the 'Collins'-class submarine build – saw Cockatoo Island closed. Sydney's Garden Island moved to focus on repair and maintenance activity in support of now Fleet Base East following ADI Limited's initial corporatisation, and latter full privatisation and evolution into Thales Australia.

Western Australia had similarly garnered significant naval support capabilities, courtesy of its role during the Second World War as a major allied submarine repair and support base. Well distanced from Eastern state competitors, the Fremantle/Henderson area went on to undergo strong maritime services industries growth, in support of booming minerals and energy projects. A natural extension into naval support next emerged with the Federal Government's decision to fund a major upgrade at Garden Island's HMAS 'Stirling' (now Fleet Base West), all then capped by the decision to base the whole 'Collins' submarine fleet in WA.



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## Key Points

- **A Federal Government intervention over a decade ago** (as part of the carve up of bicentennial grants) – and driving a major increment in Western Australian marine services industry capability – will shortly reach a new milestone with commissioning of a new floating ship-lift facility.
- **The 2009 Defence White Paper advocates a major new wave** of naval construction spanning submarines through to sealift ships, yet leaves questions unanswered in terms of both the nation's ability to afford the ramp-up program in tighter budgetary times, as well as industry's ability to secure the required labour and skills should economic recovery pick up.
- **Ten years of preference for market driven national** industry policy outcomes under the Howard Government has witnessed State governments falling over themselves to move in and fill the policy void, with major investments in shipbuilding moulded in the eyes of furthering local economy self-interest.
- **The aggregate of this activity has driven** a remarkable level of taxpayer-funded investment, yet likely duplication of key facilities is now shaping up to drive a 'free for all' between states as they seek to underpin the viability of their sites by maximising their future warship construction and sustainment share.
- **A new report financed by the South Australian** government, and looking to ensure shipbuilding industry is concentrated in that state, has called for clearer thinking in regard to ongoing facilities investment and management, as the next major round of naval shipbuilding activity beckons.

In the meantime, naval support and repair capabilities in Newcastle (NSW) underwent a major fillip in activity in the late-1980s by way of the \$400m modification (at Forgacs' yard) of the two ex-US Navy 'Newport'-class tank landing ships (now HMA Ships 'Manoora' and 'Kanimbla'). Some module construction for the 'Anzac' frigates was also undertaken in Newcastle, along with the ADI Limited-built six 'Huon'-class coastal minehunters. After the 'Anzac' frigate project began to turn down, 'Williamstown' picked up some valuable work under New Zealand's project 'Protector', yet all three of the just mentioned sites have essentially been idle for an extended period of time.

Back in the West, an \$80 million Federal Government contribution (matched by the WA state government) to mark the bicentenary kicked off the development of a substantive maritime services Common User Facility (CUF) – trading as the Australian Marine Complex – with a vision to support not only commercial maritime demand (ie: Austal) and energy & minerals resource developers, but also capture the large majority of available support work for Australian naval units based at Garden Island, as well as any visiting allied vessels needing support and/or repairs.

The concentration of investment in the AMC-CUF has nevertheless seen naval repair and maintenance work formerly performed by Tenix Defence (now BAE Systems – BAES) wither on the vine, particularly in respect to support of the 'Collins'-class submarines. This has occurred over the course of the last two years following a decision by ASC Pty Ltd to spend \$35m on a purpose-built submarine repair facility.

The new facility was formally opened in March 2008 and is set to assume all of the work previ-

ously undertaken by Tenix (ie: in the open air on a government provided 'cradle') when the floating dock (ie: used to raise vessels from the sea onto the CUF) is formally opened on 9 February.

Since this time, two projects have worked to cast in stone the medium term outlook for Australian naval shipbuilding and repair. Firstly, ASC won the build contract for the three-ship \$8 billion Sea 4000 air warfare destroyer project, on the back of a \$330m investment by the South Australian state government to build the Techport maritime technology precinct and adjacent common user facility. ASC has since spent \$100m (see article page 16) building a warship module construction facility adjacent to the CUF, which is flanked on the other side by its submarine through-life support facility.

Under the AWD contract, ASC will build a number of core modules for the new destroyers, which will then (along with modules from BAES at 'Williamstown', and Forgacs' Newcastle yard) be assembled on a mobile frame and integrated with Lockheed Martin's 'Aegis' combat system and a host of other sensors and sub-systems by AWD non-'Aegis' combat system system engineer (CSSE), Raytheon Australia. Once the vessels are ready for launching, they will be moved by a rail transfer system down to a new \$50m shiplift being built by Rolls-Royce Marine.

In parallel with the building of the AWDs, is the Joint Project 2048 endeavour to equip the Royal Australian Navy with two new amphibious ships (LHDs), which are capable of disgorging up to 1,000 troops by way of he-

licopters and (internal to the ship) dock based landing craft.

The hulls of the vessels are being built in Spain by the LHD's designer Navantia. Once completed, the hulls will be floated by barge out to Australia, where BAES (at 'Williamstown') will build each ship's superstructure, combine it with the hull made in Spain, and then integrate all relevant combat and supporting operating systems.

Western Australia did not secure any work as a result of projects Sea 4000 and Joint Project 2048, although as noted above, commissioning of the shiplift in February is expected to allow a much wider range of work to be undertaken for those RAN vessels based in the West, along with the substantive workload building to sustain the 'Collins' submarines for their last decade of service, and being assumed by ASC West's facility.

This is essentially the industry structure now eyeing the 2009 Defence White Paper's promise of a new golden age of naval shipbuilding, headed by: 12 around 4,000t future submarines to replace the 'Collins'-class from 2025; eight around 6,000t frigates to replace the 'Anzac'-class in the run up to 2030; and 20 around 2,000t multi-role vessels to replace after 2020 the existing patrol boats, minehunters and littoral utility craft.

Further proposed new naval acquisitions include a 10-15,000t strategic sealift ship; six heavy landing craft; and a logistics support and replenishment vessel (refer to page 14 of the Pacific 2010 'Exhibitor Directory' for a more substantive status report on the delivery of

current and future RAN warfighting capability).

While all good news for the Navy and local industry, one group, however, has questioned the efficacy of the current industrial structure and acquisition business models which have put today's Royal Australian Navy (RAN) in place, and is thus calling for a new debate on what might be the most effective business model and contracting structure to transit the fleet-in-being, to the future fleet envisaged by the year 2030.

The subject report – funded by the South Australian Government – but signed off by a former Chief of the Defence Force, General Peter Cosgrove (in his role as Chairman of the DefenceSA Advisory Board), first observes "there is no simple, universally agreed model for predicting the cost of designing and building a warship ... (as) there are too many variables."

Still, Australia does have some substantive recent experience in warship building going back to the two 'Oliver Hazard Perry'-class vessels (FFGs or 'Adelaide' class) built at 'Williamstown' in advance of the yard undertaking the 'Anzac' frigate projects.

The DefenceSA report, entitled – 'Naval Shipbuilding: Australia's \$250 billion National Building Opportunity – found fault with the performance-based, fixed price contract approach used for the 'Anzac' ships, particularly the fact that savings effected over the carriage of the contract all found their way back to the contractor. No savings were returned to the customer, and despite being heavily based on an existing design,

"final construction ended with significant changes to the combat system, radars, main propulsion configuration, etc which resulted in significant non-recurring design/engineering effort."

Next examined for its success and failures was the 'Collins'-class submarine program. DefenceSA analysis concludes in relation to the submarine design and build, the "extrapolation of a smaller European-based design and integration of a 'clean sheet' US combat system ... suggests that a fixed-price contract with a 'start-up' company was not the most successful model." The report goes on to discuss the LHD and AWD projects in terms of 'lessons learnt' that were fed into their contracting arrangements.

The business model ultimately adopted for the LHD was a fixed-price contract with a prime contractor, and source selection done by competition. For the AWDs, a very different business model has been employed – an alliance-based target incentive agreement (ABTIA) was concluded, bringing together the Government's acquisition agency (the Defence Materiel Organisation), the shipbuilder (ASC) and Combat System Systems Engineer (CSSE), Raytheon. The ship's designer is not part of the Alliance, but is separately contracted via a fixed-price contract to the Government.

Nor is Lockheed Martin part of the Alliance, but is contracted to supply its 'Aegis' combat system to the three Australian ships through the US Navy and a subsequent foreign military sales (FMS) agreement with Australia. The selection of vessel components was not undertaken as a fixed-price



**THE OLD VERSUS THE NEW:** Forgacs' Cairncross facility (far L) in Brisbane was a lead player in Thales' bid for the Joint Project 2048 amphibious ships before the program was secured by Navantia and Tenix (now BAE Systems), while ADI Limited's (now Thales Australia) site at Newcastle (L) headlined construction of the 'Huon'-class minehunters, yet has since been turned over to commercial purposes. Finishing touches are now just being put on the ship lift (R) at the Techport common user facility to accommodate launch of the project Sea 4000 AWDs, whilst the Australian Marine Complex at Henderson in WA (far R) will have its 12,000t vessel (lifting capacity) floating dock facility officially opened on 9 February 2010.

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competition, but a comparison of rates and fees, capability and attendant risks. Selection of the shipbuilder was also based on a range of criteria, including commercial viability and backing and the capacity to acquire sensitive technology.

With so many models to choose from, which is the most appropriate for advancing the 2009 Defence White Paper's new program of naval vessel construction? Apparently none, as the DefenceSA Board finds elements of fault with all of the historical models used to date. Overall, it is observed the most common business model is the fixed-price contract with a prime contractor. The Alliance model is a more recent development, having been used for 'Anzac' frigate maintenance and enhancement, and the AWDs.

Recognition is next given to the 2002 Naval Shipbuilding & Repair (NSR) Sector Strategic Plan, and the wisdom of its conclusion that "industry rationalisation ... was inevitable in response to both fluctuating local demand and international trends. Hence, the most effective arrangement (and lowest net cost to the nation) was for a single prime shipbuilding entity operating in a strategic alliance structure with Defence with sub-alliances/contracts for each specific project". It postulated this outcome could arise by attrition, "if the loser of the first major construction contract (ie: AWD) left the market through lack of work".

This advice, of course, was not accepted by the Howard Government, who announced in May 2004 – and with an eye to selling off the ASC upon the guidance

of merchant bankers Carnegie, Wylie & Company – "a competitive model is the preferred approach for contracting in the NSR sector, with intervention by the Government only in exceptional circumstances."

Outside of ASC's subsequent establishment as a government business enterprise (GBE) under the Commonwealth Authorities & Companies Act, very little has changed over the last six years other than the impact of the global financial crisis being drawn upon by the Government to defer again (indefinitely) the full privatisation of the company. Overseas, however, there have been major changes in Australia's three major naval technology suppliers.

The US has opted more for managed competition (and some substantive collaboration/competition, or 'co-opetition', between its major shipbuilders – General Dynamics and Northrop Grumman), whilst the French Government has advanced a concentration of expertise in DCNS, which is being pressured to deliver efficiencies and cost savings within the traditional Government ownership model.

The DefenceSA report nevertheless concentrates on substantive recent developments in the UK's shipbuilding sector, which initially – with full UK Ministry of Defence (MoD) support – witnessed the creation on 1 July (by way of a joint venture between BAES and the VT Group) of BVT Surface Fleet. Upon its formation, the organisation was greeted by a MoD 'terms of business' agreement pledging to it the vast majority of its naval vessel orders over the next 15 years.

In January, VT Group offered up its 45% stake in BVT Surface Fleet to BAES, thus creating a virtual shipbuilding monopoly for that company. According to the DefenceSA report, "the UK business model for naval shipbuilding for complex warships is now a directed, regulated source. The value proposition is a long-term partnering relationship, underpinned by strong customer-supplier engagement. The outcome was publicly characterised as the 'fight coming to an end' as the companies involved – Babcock International, BAES and VT Group – implemented agreements that would see work shared, and savings split with the MoD."

Specific details of the regulated contracting arrangements remain 'classified', however DefenceSA understands they involve "open-book accounting, and very specific performance targets that cover the entire operation of the acquisition activity – man hours per tonne, ship availability in terms of sea-days per year, etc".

If they meet their annual targets, companies are to receive "capability payments to invest in training and technology to drive further performance improvement ... there are long-term goals to reduce naval shipbuilding costs by more than £1 billion per year." The agreement is further supported by an understanding future ships should have shorter lives (15-20 years), so they can be latterly sold off mid-life to foreign navies.

Drawing all its investigations and analysis together, DefenceSA's report moves on to get a little enthusiastic about the applicability of the UK model to

Australia's circumstances. There is talk of future RAN classes of ships being more common or at least adopting common hulls to help sustain a rolling build program to maximise cost savings in order to underpin long-term industry stability.

According to DefenceSA, "one of the very clear trends in modern warship programs is the concept of building platforms with different mission roles. The European FREMM program is building 20 or more warships of the same platform design, but with different combat system configurations for three different missions: anti-submarine warfare; surface warfare and area warfare. The US Navy's Littoral Combat Ship (LCS) program builds a platform with changeable mission modules ... this is the approach for the new project Sea 1180 offshore combatant vessel for Australia."

But there is more in DefenceSA's view. Not only does the number of classes of ship need to shrink so that more common platforms can support an ever increasing number of multi-roles, but the contracting systems that govern the number of sub-contractors and component supplies need to be managed, to ensure more common systems are adopted in each and every platform.

This point is the focus of DefenceSA's biggest criticism of the competitive contracting model, as it virtually guarantees – depending on who was the successful contractor – that even basic items will differ from ship to ship. This is very much the way DefenceSA observes the acquisition of the F-100 AWD and 'Juan Carlos I' designs benefitting the RAN in



**MULTIPLE WAYS TO ORGANISE NAVAL SHIPBUILDING:** In the debate over which is the most efficient way to organise naval shipbuilding, the United States has elected a co-operative/competitive ('co-opetition') model for its two major shipbuilders, whilst in the UK, a consultant's report has convinced the Ministry of Defence to opt for a privately owned monopoly supplier. The French government has moved down a similar track to the United Kingdom, albeit with the monopoly supplier remaining government owned. The need to more flexibly respond to emerging threats within a multi-role platform has nevertheless been answered in the US by innovative designs and new entrants into naval shipbuilding.

L to R: US NAVY, BAES, DCNS & LOCKHEED MARTIN PHOTOS

the future. Having been designed by the same company (and with a little help from an interventionist industry policy whose costs are not made immediately transparent to the Spanish taxpayer), both ships benefit from a high degree of commonality in sub-systems that should help mediate long-term RAN operating costs.

The report's implication is this has happened more by accident than intention in Australia's case, and to ensure that such benefits are reaped in future RAN new vessel construction programs, DefenceSA proposes a new contracting arrangement whereby a Platform Systems Engineering Agent (PSEA) is appointed to provide the necessary overall guidance and enforcement of the quest for commonality.

According to DefenceSA, "the PSEA role does not require the infrastructure or large workforce needed in the construction task ... (it) does require a skilled and experienced engineering workforce, and the company does need a strong balance sheet if it is to carry accountability in a project. In Australia today, there are no companies with PSEA experience that could immediately fill this role ... (but) there are companies with the potential to fill the role."

Where might one find a potential PSEA if you were looking? According to DefenceSA, "common user facilities such as in Adelaide & Perth provide further opportunity for the project models discussed ... where the PSEA manages the design/engineering of the platform system. These public facilities allow the ship consolidation role to be completed or changed, without incurring a change of location, general workforce or Tier 3 suppliers."

So having made the case to minimise the number of classes of ship – which promotes commonality – DefenceSA says the next step is to find ways to achieve greater commonality across necessarily different classes of naval ship: warships, submarines, support ships, amphibious ships, etc. ... While the characteristics of warships, submarines, support ships, and amphibious

ships, etc are very different, there is still considerable opportunity to promote commonality across these naval ships and achieve savings in total cost of ownership. ... In theory, if one organisation designed all platforms in the fleet, with sensible guidance, that would achieve maximum commonality across different platforms."

In practice, this is acknowledged as being difficult, with DefenceSA conceding "this is not an immediate objective. What can be considered is to look at the broad categories of naval ship, and architect the different acquisition arrangements (in order) to promote a sensible growth path to commonality, while preserving some flexibility in the establishment of projects over long and different timescales."

It then goes on to present a new proposed model for Australian naval shipbuilding project management that (in vertical depiction) is headed by the Tier 1 prime contractor (or alliance), and the Tier 2 shipbuilder and combat system integrator, but then inserts the PSEA (who may also be alliance participants or a separate division of the shipbuilder/prime) above Tier 3, which comprises the various goods and services sub-contractors.

This rationale, says DefenceSA, "aims to promote commonality across some platform systems by using the same PSEA ... commonality is a major driver to reducing total cost of ownership; it produces savings in acquisition and considerable savings in sustainment costs. Taking that principle further ... the same PSEA could be used for submarines, destroyers and frigates ... the platform system engineering agent could be developed from the ASC teams engaged in both the current and future submarines, plus AWD production design."

"The support ships, amphibious ships and offshore combatant vessels tend to be more commercial in design, and could also be combined under one PSEA. In terms of combat systems, the combat system integrator for the destroyer and frigates could be the same."

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## IN THE BOWELS OF THE DSD: Between the difficult & the impossible

The Rudd Government has ticked-off an early milestone in its efforts to raise effective responses to broadening national security threats identified in the Prime Minister's 2008 National Security Statement (and more intensively addressed in the 2009 Defence White Paper), by publicly confirming the Department of Defence has now stood up Australia's first cyber security operations capability.

■ Canberra Bureau Report

With journalists historically invited into the bowels of the Defence Signals Directorate (DSD), Defence Minister Faulkner opened in Canberra 15 January the Commonwealth's response to the burgeoning number of electronic attacks on its networks, a Cyber Security Operations Centre (CSOC). Faulkner asserted the Government had acted quickly since coming to government in 2007 to classify cyber security as a top national priority, list it in the Prime Minister's 2008 National Security Statement, and lay out a response path in the 2009 Defence White Paper.

Yet while an initial operational capability for the CSOC has just been stood up, external studies have indicated that it is unlikely a full suite of assigned functions – both defensive and offensive – will be achievable inside of a couple of years, with a full operational capability taking even longer and requiring an investment of over \$1 billion through the next decade.

Since the first outcomes of the 2008 'e-Security' review were announced 22 December 2008, a comprehensive, national cyber security structure has taken shape, but remains largely focused on developing a defensive capability. Senator Faulkner told media the principle objective with setting up the CSOC was to "provide gov-

ernment with a comprehensive understanding of cyber threats against Australian interests, and coordinate and assist operational responses to cyber events of national importance across government and critical infrastructure."

The Government's core e-security policy development and coordination body is the E-Security Coordination Group, established in 2001. Yet its mission is essentially defensive, as typified in structuring of the last multinational 'Cyber Storm' II exercise in March 2008, which sought to "improve the ability of governments and critical infrastructure owners and operators to manage incidents affecting the National Information Infrastructure".

Initiatives contained in the 4 December 2008 National Security Science & Innovation Strategy, were also similarly concerned with managing attacks. A 'Cyber Storm' III exercise, which is scheduled to take place in September, will thus provide the first opportunity to assess the Rudd Government's new strategy – including the contribution of the CSOC – for responding to a cyber attack with nationwide impact.

An Australian Government Cyber Security Strategy (CSS) brokered through the Attorney-General's Department at the end of 2009 is said to have brought greater cohesion to the existing whole-of-government, cyber security apparatus – but contained no mention of the need for a national offensive cyber capability. The strategy, instead, sought to formalise the roles, responsibilities and policies of Australian intelligence, cyber and policing agencies to protect Australian Internet users.

The core of the CSS was the creation of a new Australian Government Computer Emergency Response Team – or CERT Australia (cert.gov.au) – and sustaining the functions and services of the existing GovCERT.au – as first announced in the 2009/10

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