

ELECTION ROUND-UP

Labor looks over the rainbow to replace the 'Collins' boats

■ Monika Georgieva/CANBERRA

New Labor Defence Minister, Joel Fitzgibbon, has wasted no time in kicking off activity within the Department of Defence, to set aside an allocation in the forthcoming 13 May Defence (2008/09) Budget papers to advance studies aimed at replacement of Australia's existing fleet of 'Collins'-class submarines.

As part of early Rudd Cabinet activity at the close of 2007, Fitzgibbon happily entertained electronic media 26 December to secure TV footage of himself with Defence Force Chief, Air Marshal Angus Houston, discussing activities required to get work on a new Defence White Paper underway.

Also on the discussion agenda was Fitzgibbon's promised Defence acquisition program review (see article page 9), which will include funding a study phase for the rumoured project Sea 1000 – the replacement of the capability currently delivered by the 'Collins' submarine fleet from 2025.

Fitzgibbon was reported in daily media as having said that while the new submarines would not be nuclear powered, they would look to taking advantage of other technological developments in conventional propulsion, as well as the use of unmanned systems.

Labor's position on the 'Collins'-class replacement was formally spelled out last August when Fitzgibbon and ALP Leader, Kevin Rudd, visited Adelaide during the week of the annual Defence + Industry Conference. Reported by media as having stolen the thunder of the then faltering Liberals, the pair proclaimed that Labor had a 'plan' to acquire new submarines, com-



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Key Points

- **The Rudd Labor government has committed** the Department of Defence to commence as early as practicable an exhaustive study aimed at assessing options for replacement of the existing six-boat 'Collins'-class submarine fleet.
- **Labor says the first of the new boats**, which will not be nuclear powered, should be ready to begin replacing 'Collins' units from 2025, and take advantage of technological developments in conventional propulsion and unmanned systems.
- **Debate over the longevity of surface warships** in high-intensity conflict has got capability planners interested in developing a new generation of submarines capable of assuming key elements of future Network Centric Warfare scenarios.
- **The cost of acquiring a more ambitious next-generation** underwater-based warfare fighting capability that rivals surface ships - as now being undertaken via US Navy 'Ohio'-class boats - might end up scuttling plans for a 4th air warfare destroyer.

mencing with a study phase in the next Defence Capability Plan (DCP) in order to support a 2011 'first pass' decision, and a 2017 start to construction.

At the time, work was known to have already been underway within the Department of Defence (via the 'Future Underwater Warfare System' office), however, in the absence of any formal Coalition announcement regarding 'Collins' replacements (other than a less well reported speech by Dr Brendan Nelson to the Submarine Institute of Australia), Labor took the initiative to present the 'Collins' submarine replacement as new policy.

Fitzgibbon went on to declare "we need to develop something which is special in

the region, that has competitive advantage. The reality is that the ASC in Adelaide is the obvious choice, it's probably the only place in Australia you could build this capability."

He then also expressed a view on the lack of 'off-the-shelf' solutions for Australia's special maritime environment needs, signalling his acceptance there was "an emerging need for a substantive developmental project" - an approach also known to be favoured by the Submarine Institute of Australia (SIA).

Labor's decision to commence the 'Collins' replacement process is nevertheless timely, in terms of the evolution of debate on the future of maritime warfare scenarios relevant

to Australian strategic requirements, for both surface ships and underwater vessels.

Two recent papers have noted that - compared to surface ships - submarines have always been favoured for their ability to gain access to areas denied to other units. Their ability to position within launch range of enemy ships (and land targets) without being detected, launch an attack and withdraw without provoking further engagement is said to remain essentially unique, as is their ability to covertly collect intelligence data.

Accordingly, as sea lines of communication become more crowded in coming years (with both civil and military vessels), and the prospect of high-intensity combat in littoral zones close to an enemy's shore begins to eat away at the survivability of surface platforms, there is a broad consensus more emphasis is likely to be given to widening traditional roles undertaken by submarines.

In short, this means future navies will look to taking advantage of a submarine's ability for 'stealth' delivery (ie: special forces, sensors and weapons), with military scientists tasked in a similar manner to the DSTO's current project 'Murula', which aims to deliver the ability to deploy two types of unmanned maritime systems - a 'Slocum Glider' autonomous underwater vehicle (AUV), and a concept rapidly deployable sensor (RDS) - in a sealed case from a 'Collins'-class submarine 21-inch torpedo tube.

The United States has already funded development of technology to transfer a number of weapon systems traditionally hosted on surface platforms into next-generation submarines - for both horizontal and vertical launch.

One current example of efforts to change the utility of the US Navy's Cold War submarine force involves the conversion of four (of 18) 'Ohio'-class ballistic missile submarines to nuclear-powered guided missile submarines (SSGNs).

The new submarines are now able to launch 154 'Tomahawk' land attack cruise missiles from canisters held within the 40ft tall/7ft diameter tubes previously used to house 'Trident II' D5 missiles, as well as being able to inject ashore as many as 75 Special Operations Forces by swimmer delivery vehicles embarked from dry deck shelters inside the host submarine.

A French/DCNS concept has alternatively emphasised the use of unmanned underwater vehicles (UUV) in enhancing the surveillance and

intelligence gathering capabilities of next-generation submarines. The SMX-22 combination envisages a Network Centric Warfare (NCW) command submarine, which also provides at-sea support for two smaller high-efficiency multiple operations (OPS) submarines.

The NCW and OPS submarines could then operate docked to form a combination vessel operating as a single unit, or alternatively, all three can undertake independent operations. The OPS vessels could be used to emplace new types of re-

motely deployed sensor systems drawing from environmentally-sourced power to undertake slow-roaming ocean surveillance functions, or deploy small underwater swarming robots and other similar systems that could potentially place submarines at the heart of future Network Centric Warfare constructs.

Outside of US Navy submarines (which are not viably an option for Australia due to their size and nuclear propulsion), there are two possible paths to a future submarine de-

sign – both sourced from Europe – from which Australia might be able to develop an approach for replacement of the 'Collins'-class.

The first is the new French 'Barracuda'-class, which at 5,300 tonnes (submerged) is similar to the size (given currently anticipated growth in the range of missions to be performed) envisaged for the 'Collins' replacement. The only problem with this boat is that it is nuclear powered, and therefore prospects for retrofitting more conventional propulsion (or Air



NEED FOR 'FRESH THINKING' ON 'COLLINS' CAPABILITY REPLACEMENT: Rapidly changing threat scenarios and technology are impacting dramatically on the range of tasks envisaged to be undertaken by future submarines. The US Navy has already moved to convert some of its Cold War 'Ohio'-class boats (far L) to more effectively support land attack and covert operations, with former nuclear missile cells now used to launch divers (L). French-based DCNS also has some ideas about submarines playing a central role in network centric warfare scenarios (R), and is already cutting steel on the French Navy's next-generation (and nuclear-powered) 'Barracuda' fleet (far R).

US NAVY PHOTOS & DCNS IMAGES

ASC fattened up for no sale? - Ctd from p 24

December 2006, as well as the growth of non-Aegis' system integration costs which will accrue to Raytheon Australia in its role as Combat System Systems Engineer (CSSE).

ASC has previously stated that 70% of the block (module) work for the three AWDs would be contracted off-site, however, judiciously reserved the other 30% of higher complexity (and thus, higher relative value) modules for itself. This means the value of work likely to be retained by the company will be closer to 50% of the budget for modules - thus suggesting the volume of revenue lost to ASC (as indicated in late-2007 at AWD Alliance briefings), will be the lower of a range of \$1 billion to 1.5 billion.

In response to a 2007 solicitation of Expressions of Interest for AWD module fabricators – which now appears unlikely to number more than three – ASC declared it would act to hold AWD contract value within the company by limiting outsourcing to

simple labour contracting. In short, ASC will procure and supply module sub-contractors with 'all material required for the manufacture, painting, assembly, outfitting (and related installations) of and within the modules'.

Of course, the AWD Alliance as a functioning project manager will have its own operating expenses - along with design fees and related costs to Navantia as platform designer (Euros 285m), suggesting another \$1 billion will have no trouble bleeding off from available projects funds over the next substantive decade of the project.

In short, net revenue accruing to ASC from the AWD construction contract is estimated by ADBR to be in the order of \$3.5 billion over the period to 2019/20. Added to this is another \$3.3 billion anticipated to accrue from submarine TLS and related 'Collins' submarine capability enhancement work.

The company's most recent Annual Report suggests, however, that TLS revenue is likely to peak over the period 2007 to 2009,

given its hands will be full dealing with three submarines simultaneously (an historically high level of activity), and incentive payments will reach a ceiling as the company caps out on efficiency measure increment scales contained in the initial TLS contract.

Spreading the receivables from AWD construction across the period to 2019/20 – and loading the forward years in a manner that would see 70% of the contract value paid in the years running up to launching of the first AWD in 2014 (ie: delayed from 2013) – ADBR has built a spreadsheet upon which to consider valuation metrics affecting the company (see chart page 22).

The baseline for this rests on the \$158.9m of Total Equity declared in the 2006/07 Annual Report (and comprising Contributed Equity of \$10m, Reserves of \$54.5m and adjusted Retained Earnings of \$94.4m), and recognising substantive new investments hitting the accounts of close to \$150m from work currently being undertaken at Osborne (SA) & Henderson (WA).

As this begins to hit the accounts (via depreciation) over the next couple of financial years, the growth of Total Equity may slow considerably, although current corporate retention policy (40% of profit after tax) could be expected to see this climb to around \$200m by 2019/20.

As derived from baseline annual report metrics, the next twelve years could see ASC expecting to generate \$6.5-6.8 billion in revenues. Using averages of the previous four years' financial results to set a trend base for 2007/08, ADBR then converted these into a series of corporate performance measures.

It is conceivable that such ratios may continue to improve in future years given ASC's continued honing of its submarine support activities to higher levels of efficiency, with more to come as the new AMC-CUF facility in WA is commissioned. Adjusting asset levels to reflect new investments and the current 40% retention policy, ADBR's analysis suggests

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Independent Propulsion - AIP - see p33, JMSDF) would need to be determined, including non-recurring costs borne by Australia as prospectively the only customer for a vessel of this size.

DCNS confirmed 20 December 2007 that it had just begun industrial production of the first of six Barracuda-type nuclear powered attack submarines (designed to replace the French Navy's Rubis/Amethyste-class), and set to enter into service between 2016 and 2027.

Reflective of new strategic circumstances - and in addition to anti-surface and anti-submarine capabilities - these SSNs will carry intelligence gathering equipment and MDCN cruise missiles, and will be able to deploy special forces. The payload of 20 tube-launched weapons will comprise a mix of future heavy weight torpedos, cruise missiles and SM39 anti-ship missiles.

One other complication in proposing such intricate European technical involvement in a major Australian warfighting platform, is the renewed frustrations (as said to have been experienced with the 'Collins' RCS), that might be brought on by such a project in terms of securing access to US technology proposed for incorporation into the vessel.

The second possible design base for a future replacement 'Collins'-class submarine could be drawn from the Spanish government's current endeavour to build a new 2,400 tonne S80 submarine, which incorporates a US-sourced Lockheed Martin combat system and substantial underwater vessel technology sourced from the United Kingdom.

Similar to the original Kockums design that had additional hull rings (or 'cans') in-



NAVANTIA S80 SUBMARINE IMAGE

serted into the front and rear of the 'Collins'-class design to yield a larger space and weight submarine, there is a possibility that a vessel more suited to Australia's said to be 'unique' strategic needs might be similarly derived.

The driver for this could nonetheless be improved inter-RAN/Spanish Armada technical cooperation (albeit much more ambitious) expected to flower as part of Australia's decision to adopt the basic F-100 ship design for its new project Sea 4000 air warfare destroyers.

Given the involvement of a US combat system supplier/integrator on the new submarine (as is the case with Lockheed Martin on the Spanish project), satisfying US technology transfer restrictions might then be considerably more viably addressed than with the alternative proposal to source a French submarine design.

REPLACEMENT SUBMARINE DEBATE

In a speech to the ADBR-sponsored 1st National Defence Capability Development Symposium (NDCDS), held in Canberra on 27 November 2007, former submariner, Terry Roach (representing the SIA), spoke about some key lessons that had been learned throughout the 'Collins' submarine project.

Roach suggested the practical adoption of such wisdom by current naval authorities could help to minimise risks associated with a future submarine replacement program given - having already been through one submarine build process -

Australia now possessed "a great foundation for future submarine construction."

Roach told NDCDS delegates that the 'Collins' program - despite its complexities and controversy - really had proved that Australia possessed the capacity to manage a complex submarine construction program, and meld this into the acquisition of a world-class conventional submarine capability.

He said the 'Collins' program had clearly enhanced the Australian shipbuilding skill base, with the ASC proving "highly effective and efficient" in creating a multinational submarine. Deficiencies in the build phase were accordingly "more related to contractual problems, including overseas suppliers, than mistakes on the part of Australian industry," he said.

In view of this experience, Roach saw it important that in any future Australian submarine program, more emphasis be placed on the role and responsibilities of the prime contractor, along with efforts to reduce the time taken to rectify design defects associated with sea trials.

He further noted that major contractual challenges facing Defence capability planners included: "value for money; the use of novel contracting principles with associated conditions; and assurance regarding costs, progress and payments."

Roach considered that future submarine combat systems should be based on next generation development of the US Navy-sourced Replacement Combat System (RCS) currently

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Battlespace...

Systems will supply the 9LV Combat Management System, and the 'Sea Giraffe' agile multi-beam (AMB) radar. The combat system to be installed on the LHD is based on the anti-ship missile defence system upgrade being installed across the RAN's current 'Anzac'-class frigates. Special features of the system will include helicopter control, watercraft control and close-in self-defence against military and asymmetric threats. Work is to begin immediately, and will span more than six years until the LHDs are delivered in 2013 and 2015. The majority of the work will be performed in Adelaide and Melbourne.

RNZAF on the hunt for pilot trainers

The NZ Cabinet gave its Defence Force (NZDF) leaders the green light 27 November to begin acquiring advanced pilot training aircraft for its Air Force (RNZAF). The project aims to find a suitable replacement for RNZAF-leased 1980s-vintage B200 'Kingair' aircraft. At this stage, no decision has been made as to the number and type of aircraft required (and the project cost), although submissions will be sought from industry via RFT in 2008 to supply aircraft, a training package - including a simulator and other modern training devices - and

maintenance and support. The NZ Government has further directed that the capability to be provided through the new training system be managed and run by the NZDF, rather than through outsourced training to other military forces or civilian training organisations. Aircraft to which the training regime will be applied include: C-130 'Hercules', Boeing 757, NH90 helicopter and the P-3K 'Orion'. Agusta Westland's twin-engine AW109E 'Power' helicopter was selected 30 October for the NZDF's new training & light utility helicopter requirement. Contract negotiations are underway for five helicopters and a flight simulator,

with contract signature expected in the first quarter of 2008.

'ScanEagle' in destroyer bound flight test

The guided-missile destroyer USS 'Oscar Austin' (DDG 79) reportedly completed 27 November 2007 "a robust testing phase" of the Boeing/Insitu 'ScanEagle' unmanned aerial vehicle (UAV). The primary mission of the UAV of the subject destroyer was said to involve the provision of intelligence, surveillance, and reconnaissance support to support the ship's role in protecting the USS 'Harry S Truman' Carrier Strike Group (HSTCSG). While in flight,

Replacing the 'Collins' - Ctd from page 28

being installed across the 'Collins' fleet - and begun with HMAS 'Waller'. Increased access to US Navy technology and submarine design expertise would also reduce risk in moving forward with a replacement submarine capability, he said.

Roach also raised the prospective sale of ASC Pty Ltd as one externality that might impact on the freedom to which US underwater technologies would be made available to Australia for its next-generation submarine. He cited the calming impact a 100% Commonwealth-owned Australian submarine builder had had on diminishing US Navy fears about intellectual property leakage, and of third party oversight of access to (and use of) sensitive technology.

One other paper - 'Australia's Future Underwater Operations and System Requirements' - released in April 2007, also provided some useful value in terms of the growth of new technologies, not only to help advance the capabilities of next-generation submarines, but also open debate on the manned versus unmanned question.

On the back of the 2005 Strategic Policy Update, the Kokoda paper recognised the



rapidly changing nature of conflict scenarios that would need to be addressed by the ADF in the future, including: counter-terrorism operations; inter-state conflicts, preventing the proliferation of weapons of mass destruction and dealing with security concerns arising from weak or failing states.

The paper noted that since Australia built its 'Collins' fleet, many other regional countries had also judged that the underwater environment in the 2025 to 2050 period "will continue to be largely opaque." Given such an environment, Kokoda warned "it would not be appropriate for Australia to simply acquire a modernised version of its current underwater force.

Instead, Kokoda saw a broader range of underwater capabilities deserving consideration for inclusion in the replacement boats, including: next-generation long-range sonar

systems; deployable short- and medium-range underwater sensor systems; modern sea mines; modern mine counter-measure capabilities; next-generation submarines; unmanned submersibles and submarine launched uninhabited aerial vehicles; and networking of the underwater domain.

Kokoda's paper also believed defence capability planners should adopt a systems approach to defining the optimal mix of next-generation underwater capabilities, with the preferred mix containing next-generation underwater surveillance systems (mostly deployable in future crises by air, surface and sub-surface platforms).

Also on Kokoda's capability list was: next generation submarines driven by advanced-technology diesel-electric propulsion systems, and fitted with very advanced sensors,

weapon and combat data systems (and carrying modular cannisters containing mission payload launch and recovery systems); a selected mix of modern sea mines; and a mix of capabilities that in a package will provide high flexible means of countering modern sea mines."

Later in its paper, Kokoda (and not so different from DCNS' concept - see page 27) alluded to rapid developments in underwater communications - such a Nautronix's (now L-3 Communications Nautronix) Acoustic Digital Spread Spectrum (ADS2) communications system, and other unmanned underwater vehicle (UUV) technologies - increasing the safety of operating manned submarines, and potentially making them redundant in the longer-term.

Combining all these new technologies and systems into a new platform will inevitably drive up the size of any future replacement Australian underwater warfighting platform, as well as its overall cost. At 2,600 tonnes, the RAN already operates the world's largest conventional submarines - which have no equivalent in terms of non-nuclear boats - hence Joel Fitzgibbon's reference that in replacing the 'Collins' fleet, there was "an emerging need for a substantive developmental project". [ADBR]