INTERNATIONAL | by Robbin Laird

Australia Shaping an Integrated Force

The Australian Navy is in the throes of its largest recapitalization since the end of World War II – and it's coming at a time when the Australian Defence Force (ADF) is working across the services to shape an integrated force. This means that although the Navy will be acquiring new platforms (from the ground up), it is looking closely at the "integrateability" of those new platforms with Army, Air Force, and space capabilities as well.

In August, the Williams Foundation hosted a seminar in Canberra on new approaches to air-sea integration. I had a chance to interview a number of senior Navy, Air Force and Army officers before, during and after the seminar, and these interviews provided a comprehensive picture of how the Australian Navy is modernizing and how its service partners view the cross-modernization efforts among Navy, Army and Air Force.

The Aussies are shaping a transformed military force, one built around new platforms but ones that operate in a joint manner in an extended battlespace. The goal is to extend the defence perimeter of Australia and create, in effect, their own version of an Anti-Access/Area Denial (A2/AD) strategy.

They also recognize a key reality of 21st century military evolution in terms of shaping an integrated information-based operating force. Interactive modernization of the force is built around decision-making superiority and that will come with an effective information dominant force.

Vice Admiral Tim Barrett, Chief of the Navy, provided a strategic overview on how he saw the way ahead for the Australian Navy. His conference presentation underscored that "we are not building an interoperable navy; we are building an integrated force for the Australian Defence Force." He drove home the point that ADF integration was crucial in order for the ADF to support government objectives in the region and beyond and to provide for a force capable of decisive lethality. By so doing, Australia would have a force equally useful in coalition operations in which distributed lethality is the operational objective. He noted that it is not about massing force in a classic sense; it is about shaping a force that can "maximize the adversary's vulnerabilities while reducing our own."

RAdm Tim Barrett

"We're not building an interoperable navy; we are building an integrated force."

Barrett reinforced, several times, that this is not about an 'add-in, after the fact capability'; instead, he asserted the need to design and train from the ground up, to have a force trained and equipped to be capable of decisive lethality. He modernized Patton's great quote, saying that you *fight* war with technology; but you *win* with people. It is about equipping the right way with the right equipment, and training effectively to gain a decisive advantage. In this way, he believes the recapitalization effort created "a watershed opportunity for the Australian Navy."

He sees this opportunity, not so much in terms of simply building new platforms, but the right ones. And with regard to the right ones, he had in mind, ships built from the ground up which could be interoperable with JSF, P-8, Growler, Wedgetail and other joint assets. "We need to achieve the force supremacy inherent in each of these

October 2016 – Cockpit view of a Royal Australian Air Force AP-3C Orion from 11 Squadron as it flies over Malaysia during Exercise ***Bersama Lima.***

Royal Australian Air Force Flight Lieutenant Mark Swinn, an Air Combat Officer from 2 Squadron, operates a sensor panel inside of an E-7A Wedgetail aircraft during Exercise Bersama Lima 2016.

platforms, but we can do that only by shaping integrated ways to operate."

He highlighted that the Navy is in the process of shaping a 21st century task force concept appropriate to a strategy of distributed lethality and operations.

A key element of the new approach is how platforms will interact with one another in distributed strike and defensive operations, such as the ability to cue weapons across a task force.

After his presentation, I had the chance to sit down with Vice Admiral Barrett and to expand the conversation. Clearly, a key element in his thinking is how to get the new build of ships right for an age in which one wants to build an integrated, but distributed force.

The Vice Admiral underscored that "We need agility in the process of changing ships through life, continuing to evolve the new ships, depending on how the threat is evolving. This means that we need to control the combat system software as well as build the hulls. We will change the combat system and the software many times in the life of that ship; whereas, the hull, machinery in the plant doesn't.

"That might sound like a statement of the obvious, but it's not a statement that's readily understood by our industry here in Australia. We need to organize ourselves to have an effective parent navy capability. We need to manage commonality across the various ship build processes. That will not happen if we build someone else's ship in Australia which is designed to operate in separate classes."

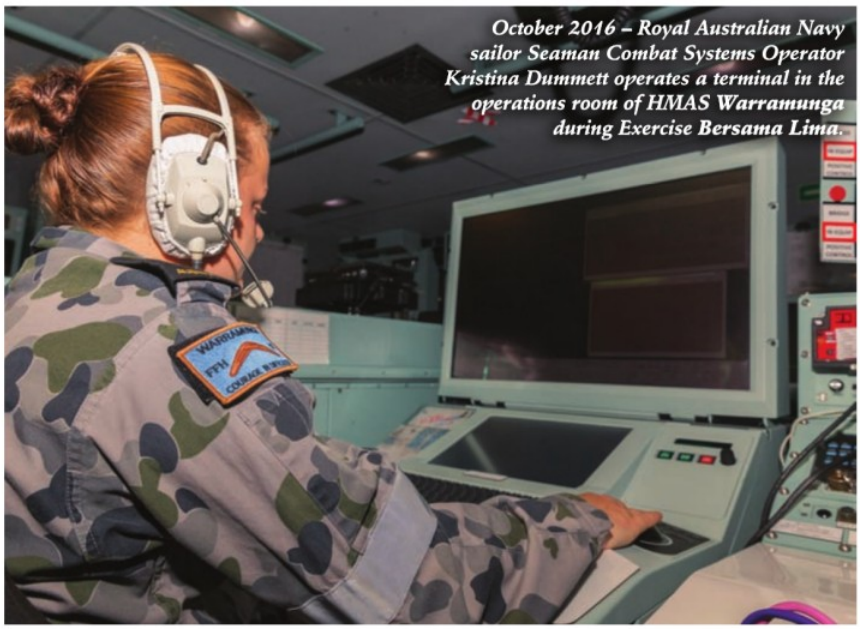
He added that Australia needs a holistic approach. "I don't want an individual class to be considered in isolation. I want to cross-learn and cross-operate throughout our various classes of ships, and notably with regard to software integration and development."

The shaping a new task force approach as well as the challenge of building out a force capable of integration in the battlespace was underscored by **Rear Admiral Stuart Mayer**, Commander of the Australian Fleet. He points out that the Army, Navy and Air forces are evolving in the context of tapping shared networks to empower their platforms to form an extended battlespace. But the challenge, he observed, is to work through how to most effectively shape, coordinate and execute effects from the networked force while retaining decision authorities at the lowest practical level to achieve speed of decision.

He highlights that the Navy is returning to a task force concept but one that is 21st century in character, whereby Navy is tapping into ground and air assets as "part" of the task force, rather than simply focusing on Navy-operated assets.

This evolution of the task force effect and the networked approach, clearly in the mode of what the U.S. Navy refers to as the "kill web," will require the evolution of capabilities, both in terms of connectivity, and training.

During the seminar he characterized the network as a weapon system with "no single master" and that one of the ADF's challenges is to shape the evolving network in order to effectively operate in a distributed multi domain task force. "Each service is designing its platforms and enabling their



October 2016 – Royal Australian Navy sailor Seaman Combat Systems Operator Kristina Dummett operates a terminal in the operations room of HMAS Warramunga during Exercise Bersama Lima.

RAdm Stuart Mayer

Joint is not a choice, it's an operational necessity, and the network is a weapons system."

potential through the elements of a common network," he explains.

There is increased overlap for the air and sea forces, at the very least through the access and synergy provided in the network. "A fundamental question presents itself," he continued, "how should we best develop, certify and deploy our joint network that must be cross domain in nature?"

RAdm Mayer argues that the Australian Defence Force is on a good track but needs to enhance its capability to work in a joint domain that recognizes that tactical effects are generated by Services, while operational outcomes are inherently Joint. In effect, the Services provide the muscle behind the Joint intent.

If the ADF is to achieve its potential, it will need to design forces from the ground up that are interconnected by a single reference standard rather than simply connecting assets after the fact. But to do so requires an open architecture approach to building a joint network that recognizes the different needs of the participants. The role of the network as a weapon system requires that it be designed, deployed and certified like any other weapon system.

"We are joint by necessity. Unlike the U.S. Navy, we do not have our own air force or our own army. Joint is not a theological choice, it's an operational necessity."

It was clear, both from his presentation and our discussion during an interview, that Rear Admiral Mayer is focused on how the build out of the Navy in the period ahead will be highly correlated with the evolution of the joint network. "The network is a weapons system. Lethality and survivability have to be realized through a networked effect."

He emphasized throughout the interview that not enough work has yet been done to prioritize the evolving C2 and network systems that empower the platforms in the force, including but not limited to the amphibious force. He sees this area of development as a crucial one in creating a more interactive joint force able to deliver lethal effect.

"The potential of each of the individual platforms in a network is such that we've actually got to preset the limits of the fight before we get to it. The decisions on what we'll do, how much we'll share, and what sovereign rights we will retain have to be preset into each one of the combat systems before you switch it on and join a network. There is no point designing a combat system capable of defeating supersonic threats and throttling it with a slow network or cumbersome C2 decision architecture."

The Navy is adding new capabilities with the amphibious ships, the new air warfare destroyer and a new submarine, but inherent in this effort is that the platforms they will build will be highly "inte-

*Commander of Headquarters Integrated Area Defence System Royal Australian Air Force officer **Air Vice Marshall Bill Henman** (left) listens to opening brief of **Exercise Bersama Lima 2016** held at Changi Naval Base, Singapore in October 2016. Approximately 400 ADF personnel from Navy, Army and Air Forces participated in the combined, joint, integration training exercise held in Malaysia, Singapore and the South China Sea in October 2016. The exercise incorporated air, land and maritime field training exercises, live fire serials, and staff officer training.*

*October 2016 – RAN sailor Able Seaman Marine Technician Bradley Colvin-Wonnocott checks mechanical systems aboard HMAS **Warramunga** are performing correctly during Exercise **Bersama Lima** in Singapore.*

grateable" with Wedgetail, the F-35, the P8 and Triton – all of which are part of the evolving task force concept to operate with flexible and modular forces.

"The nature of the force we are shaping is analogous to a biological system in which the elements flourish based on their natural relationship within the environment. We have an opportunity to shape both the platforms and the network, but we will only achieve the flourishing ecosystem we seek if each harmonize with the other, and the overall effectiveness is considered on the health of the ecosystem overall."

RAdm Mayer illustrated his point by discussing the evolving anti-submarine warfare approach. "An ASW network will leverage the potential of the individual constituent platforms and that in turn will determine the lethality of the system. When the individual platforms actually go into a fight, they're part of an interdependent system. The thing that will dumb down the system will be a network that's not tailored to leverage the potential of the elements, or a network that holds decision authority at a level that is a constraint on timely decision-making. The network will determine the lethality of our combined system."

This message meshed with what **Rear Admiral Mead** had to say from his office in Canberra. The joint capability manager for the Australian navy highlighted how the Navy's new build of ships is solidly placed in a joint context. For example, with regard to the new submarines, the Navy is looking at its interactive role in the battlespace. "The new submarines and their combat systems will clearly be designed effectively to tap into the maritime warfare network. The task will be moving that information around so it won't duplicate and so there's no gaps in the coverage."

An interview with **Rear Admiral Tony Dalton**, the head of the Joint Systems Division of the ADF's acquisition and sustainment group, was next on my agenda. RAdm Dalton talked of the importance of software upgradeable platforms. We discussed the Wedgetail aircraft, which is evolving from an air battle management system to a battle managements system with Army and Navy officers onboard – working the joint integration piece and evolving the software accordingly.

He went on to explain his perspective of the general evolution of navy platforms in the decade ahead. "The evolving maturation of the Wedgetail radar is bringing new capabilities to the joint force, and we are looking at other systems, such as the new systems on board our surface fleet, to evolve in a similar manner. The locally developed, phased array radars onboard our Anzac-class frigates are good, but the next generation is on a different planet in terms of capability. It's driving a change in the way we think. It's not a classic radar at all; it's a high power, highly sensitive transmitter and receiver array. You can do lots of things with it in the battlespace. This is a reforming technology that will reshape the way we think about task groups, how ships communicate, how they operate, and where their blind arcs are."

In short, the recapitalization of the Australian Navy is about adding new platforms, but with a very different approach than in the past. It is not about replacement platforms focused on narrowly-specialized functions. It is ships built in the software-upgradeable age and able to cross-modernize with new Air Force and Army systems.

It is about shaping an integrated force that can deliver lethal effect in the defence of Australia when necessary, and work effectively with core allies. **FLD**

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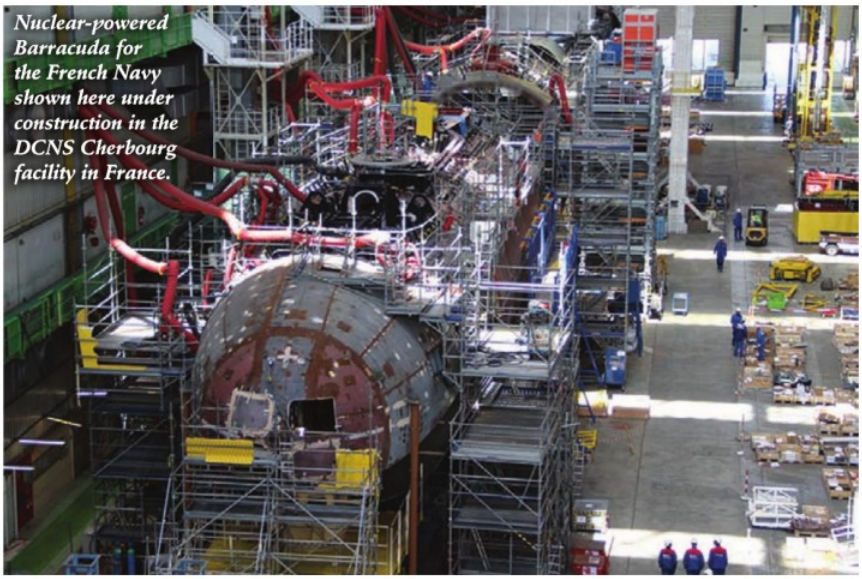
ADF PHOTOS: CPL SEBASTIAN BEURICH

INDUSTRY PERSPECTIVE | by Robbin Laird

Industry Perspective on New Aussie Subs



Nuclear-powered Barracuda for the French Navy shown here under construction in the DCNS Cherbourg facility in France.

During a recent visit to Australia to participate in the Williams Seminar on air-land sea integration, I had the chance to visit with *DCNS Australia* and get their perspective on the way ahead in building a new class of submarines. I was able as well to discuss with senior Royal Navy officers how they view this new way forward, and will discuss that in later articles.

In mid-August 2016, I sat down with Brent Clark, Director of Strategy at DCNS Australia. An experienced submariner with the Royal Australian Navy, he wanted to continue to work on naval systems after retiring from the RAN. He found opportunities in the private sector, including at Thales Naval Systems in Australia. When DCNS Australia was created in early 2015, Clark joined the company to help guide the competitive bid, which won Australia's submarine contract earlier this year.

We started by discussing why he believed that DCNS won the competition. He emphasized that French domain knowledge in the submarine business and operations as well as the French commitment to sovereignty in the area had an important impact on Australian thinking. Clearly, the Aussies wanted a submarine that operates throughout the Pacific and one their own industry could build and support in a sovereign manner.

"There are actually only two countries in the West who still understand what sovereignty is and requires in the development and manufacture of military platforms – the United States and France. If Australia wants to learn what sovereignty in this area means, they clearly have to work with a nation that does know, and exercises such capabilities."

Given that the United States does not build diesel submarines, the only other real candidate in Clark's view was France, and hence DCNS. The competition was among three contenders: Japanese, German and French. Of these, only the French company, DCNS, had the kind of long-standing experience in operating a submarine at the distances that Australia wanted.

"The French had been operating submarines in a very tactical, fully-deployed way for a very long period of time, which is in clear contrast to either Japan or Germany currently. France deploys its submarines into the Western Indian Ocean and operates on long deployments similar to Australia or the United States. In contrast, Germany and Japan operate their submarines at sea for about a month at a time. And being able to support and sustain longer deployments is crucial to Australia for its next generation submarine as well."

We went on to discuss the impact of the Collins-class experience on how Australia is considering its next generation submarine. Clark underscored that Collins was a one-off variant of a Swedish submarine and, as such, meant that Australia had to operate in a *sui generis* space with regard to the evolution of these submarines. "We had a Swedish exchange officer come to sea with us when I was onboard a Collins-class submarine and we deployed to New Zealand," noted Clark in explaining this. "On Day-28 of the deployment he walked into the wardroom and stated that 'I've now set a record as a Swedish submariner for the most continuous days at sea.' We all looked at him and thought "we're only at sea for 28."

Clark contrasted the experience with the Oberon-class submarine, which preceded the Collins, in that there were 19 different countries using Oberon-class submarines, which constituted a comprehensive user group. This meant that Australia could leverage other nation's operational experiences.

"With Collins, we ended up operating six boats by ourselves with very little reach back to Sweden because they didn't operate the same way, and they hadn't operated that submarine either. So it took Australia an awful long time to realize what that means."

Clearly Australia does not want to pursue a *sui generis* program with a country that does not have extensive long distance operating experience. The DCNS offering allows Australia to draw upon French operational experience and evolving technologies, to be part of a larger submarine enterprise, and, with the combat systems being American, being able to leverage U.S. combat systems technology.

In other words, much like the rest of the Australian Defence Force (ADF) which is moving towards buying platforms where they are part of global fleets or systems, the Navy wanted to ensure that they did the same with regard to their new submarine class. And DCNS brings to the Australian

Navy significant experience with regard to cooperative building and sustaining of submarines in the manner in which Australia will want to operate in the extended battlespace.

"We were very confident of the operating cycle of the submarine. We're very confident of the maintenance of the submarine, and the maintenance philosophy. The French maintain their sovereignty exactly in the same sort of cycle that the Australians wanted."

We then discussed the track record of DCNS in transferring the kind of technology Australia wants to build the new generation submarine, and particularly the ability to leverage what Australia has already invested in the infrastructure at Adelaide. "The company is very good at transferring technology, which was a requirement for Australia," noted Clark. "The Brazilian example was important for Australia as, in that case, DCNS provided the Brazilians with the ability to create a sovereign production capability for their Scorpion-class submarines. You don't have to go back to France for anything if you don't wish to."

DCNS will be working with Australia to ensure a 21st century infrastructure for the build and the sustainment of the submarine. Clark also explained that DCNS builds submarines differently than do the Japanese and Germans. "We vertically integrate sections as opposed to horizontally integrate them for a whole range reasons, including occupational health and safety. Having worked in a variety of shipyards, one of the big problems you have is lots and lots and lots and lots of eye injuries from dust and rubbish going to people's eyes. That's because welders end up welding on their back. The way we build is basically the welders stand up. So that's it. It is more efficient and more productive."

Reportedly, stealth, or the lack of it, also contributed to choosing the French Barracuda, but such details are classified.

A key part of the program is to shape a new way to build ships in Australia, which will almost certainly happen with the new air warfare destroyer as well.

The design contract between DCNS and Australia was signed on September 30th, and Australian technicians will move to Cherbourg and start the process of preparing for the technology transfer necessary to build the new submarine in Australia. Over time, the French manpower involvement in the program will decrease as the Australians ramp up their manpower numbers in the submarine build process. "Where the requirement for French supervision starts to end really depends on how quickly we can get the Australian workforce skilled, and productive," noted Clark.

In late September, Lockheed Martin Australia was selected by the Australian government as the Combat Systems Integrator (CSI) for the submarine program, and DCNS Australia will work closely with them also. "We have said the three entities – DCNS, the CSI and the Commonwealth – must work together to deliver a whole warship performance. We are going to co-contract with the CSI for performance."

This evolving and integrated approach is also in contrast with the Collins class experience. "If we go back to the combat system on Collins which was basically supplied as government-furnished equipment (GFE) – the builder had no ability to interact – boxes would turn up and the builder was told to install them. The builder did that, but of course when the combat system was turned on, it didn't work properly."

These lessons have contributed to the DCNS message and way of doing business explained Clark. "We consistently and constantly said during the competitive evaluation process that we could not work any other way but collaboratively with the CSI – and that clearly is the way ahead for a successful program." **FLD**

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