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Hommage aux « Marins du Ciel »

In English : Next Gen Integration 24

AUSTRALIAN PERSPECTIVES ON NEW ALLIED AIR-SEA INTEGRATION

The following abstracts stem from presentations and interviews done during the Australian Williams Foundation seminar on new approaches to air-sea integration held on August 10, 2016 in Canberra, as well as complementary interviews done in the aftermath (such as the one with DCNS referring to this year's French contract with the Royal Australian Navy).

« Beginning in March 2014, the Williams Foundation began a series of seminars and workshops to examine, both conceptually and practically ways to build a 21st century combat force, which can prevail in the extended battlespace. This can be looked at as a force operating in what the U.S. Chief of Naval Operations refers to as kill webs or what an Australian Army General called building an Australian anti-access anti-denial strategy.», says the overview of the report, which can be found in its full length in Second line of defense's website[1].

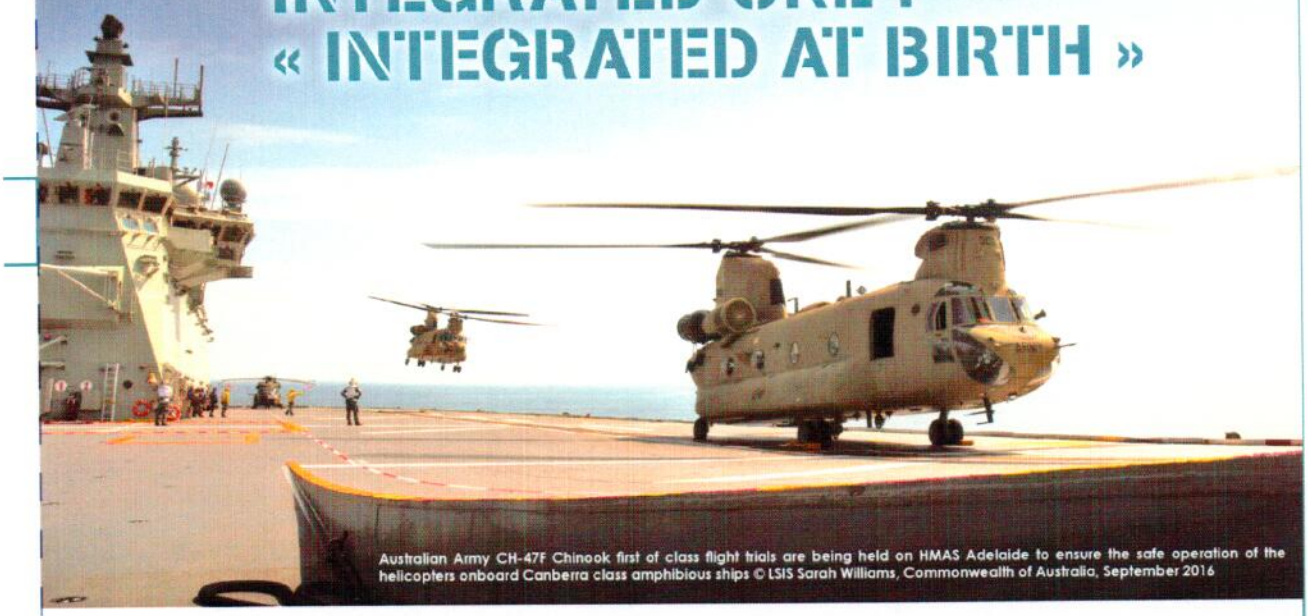
In addition to Australian Navy Chiefs, two major foreign guests to the seminar, Rear Admiral Manazir, the Deputy Chief of US Naval Operations for Warfare Systems, and Captain Nick Walker of the Royal Navy are highlighted in the following pages, as well as two industrial views: Raytheon's and DCNS.

One of the architects of this seminar series is Air Vice Marshall (Retired) John Blackburn, who is a member of our Editorial Board. This section therefore starts with his analysis and perspective on crafting what he refers to as the « Information Age Military ».

[1]The full report can be downloaded at >>> http://www.sldinfo.com/new-approaches-to-air-sea-integration/ or read online at >>> http://online.flipbuilder.com/lrty/lieu/.

«24th iteration of Exercise Kakadu CLNS Justin Brown, Commonwealth of Australia, September 2016

MOVING FROM A CONNECTED FORCE TO AN INTEGRATED ONE : « INTEGRATED AT BIRTH »



Australian Army CH-47F Chinook first of class flight trials are being held on HMAS Adelaide to ensure the safe operation of the helicopters onboard Canberra class amphibious ships © LSIS Sarah Williams, Commonwealth of Australia, September 2016

By Air Vice Marshal (Retired) John Blackburn

Towards a force integrated by design

What we've seen in the last decade is the services focused on each doing their transformation or modernization programs in their individual domains.

There have been significant efforts to address force integration of existing force platforms or systems. However, such integration is primarily an "after market "activity. In other words we are trying to integrate force components after they have been designed or acquired as single service assets. Integration after the fact means that we are always in lag of the threat. As any fighter pilot will tell you, you win by "pulling lead" on the target, not by following in "lag."

Whilst this approach may have served us well to date, the changes in technology afforded by 5th Generation capabilities present a unique opportunity to integrate the future force in the design phase of force definition and acquisition.

A force integrated by design would be far more operationally effective than one integrated after acquisition. Given the threats that we anticipate over the next decades, we have no choice but to take the integrated approach if we are to win.

The benefits from integration at the design level are becoming more and more evident. However, teaming the three services to work together in the design phase is not in our DNA.

We are born and bred in single service cultures and, whilst we fight in a joint force, most people don't think of that integrated force design as being about war fighting, they refer to it as a "process." It's not a process, it's about a change in mindset, it's a change in culture, and it's all about teamwork before we get the equipment and go to war with it.

Integration after the fact means that we are always in lag of the threat

Designing a capability as a team

By "designing" a capability as a team, we will have a far more effective integrated war fighting capability. This is about war fighting and reducing operational risk, and that is a mental change, it's not just a technology change.

My premise is that part of the problem of the integrated force design is a cultural and behavioral one. We want to explore this opportunity by selecting a capability, that requires Army, Navy and Air Force and the Joint Staff to sit down together with industry and with academia to explore how we can shape a new capability for Australia.

However, teaming the three services to work together in the design phase is not in our DNA

« INTEGRATED AT BIRTH » - Air Force Flight Camp is an initiative to increase capability through diversity and female recruitment. The camp, attended by thirteen girls aged 16-24 years, was held at RAAF Base Pearce © sergeant Murray Staff, Commonwealth of Australia, Department of Defence, October 2016

What it requires us to do is to sit down and say collectively, "How we're going to take all the assets that we have, and those that are coming in the future, and make sure we're going to produce an integrated force with a superior war fighting capability in the extended battle space that will result in lower operational risk."

We see that as the main challenge and the opportunity to design the future force, integrated at birth

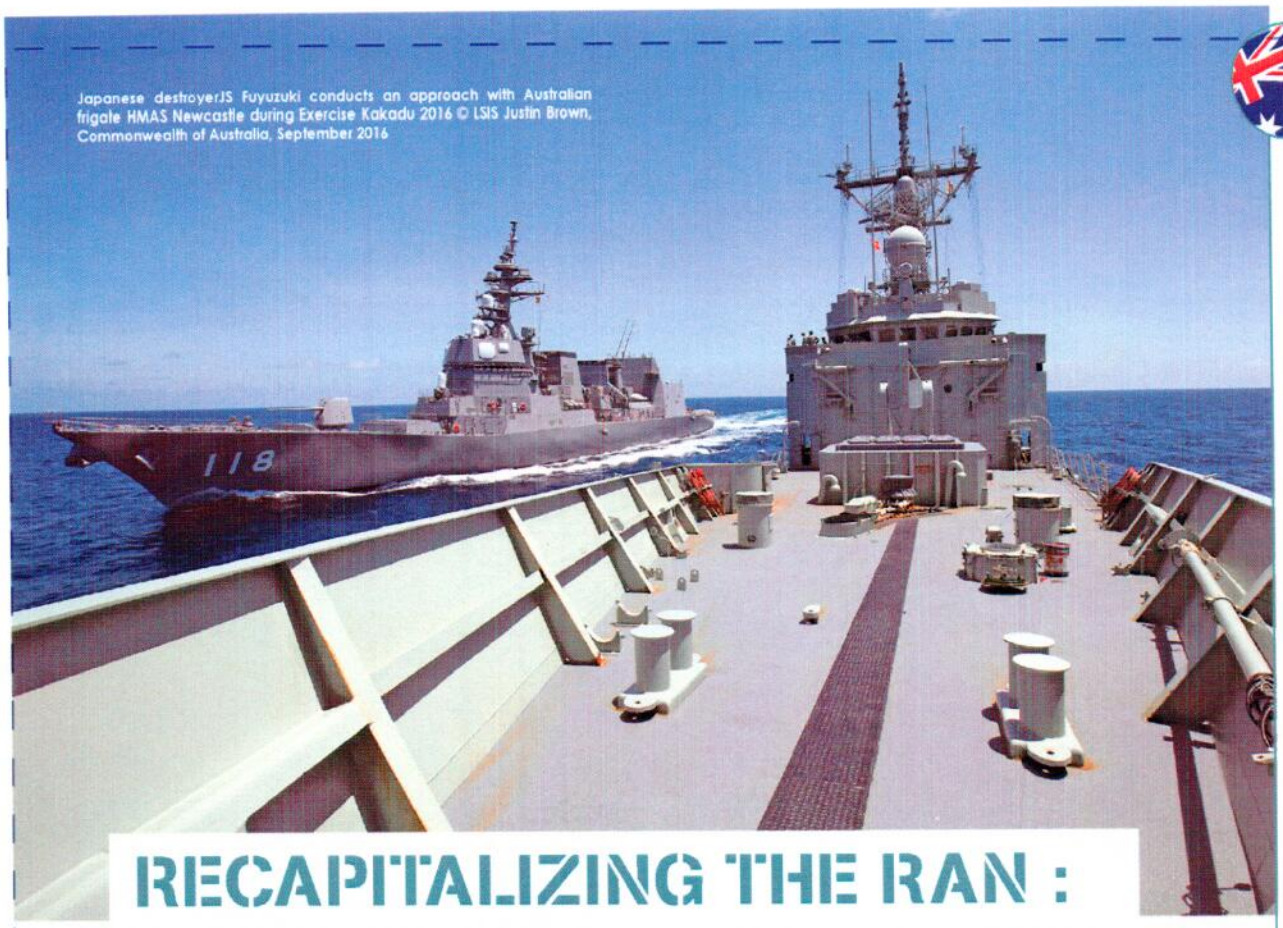
We will explore a new way of working together at the integrated level and we intend to conduct some analysis with force characteristics of this future integrated force. We aim to help the project officers think beyond their own projects to design in greater capability to leverage one another from the outset, from the design level.

In fact, the challenge is to ensure that the aperture is wide within individual projects to have the kind of interactive dynamic developments which a joint force design process can unleash Unfortunately, many projects often narrow the aperture to a replacement mindset in order to save time.

We want the project officers of individual projects to be able to say: "*Okay, I've got to make sure that the capability I'm designing is a part of the future kill web rather than a force component networked or connected in an after-market after thought*". We see that as the main challenge and the opportunity to design the future force, integrated at birth.

© Abis Kayla Hayes, Commonwealth of Australia, September 2016

Exercise KAKADU is a joint-enabled, biennial exercise hosted by the Royal Australian Navy (RAN) and supported by the Royal Australian Air Force. KAKADU is the Navy's premier maritime exercise, developing interoperability between nations in the maritime and air domains, and providing training opportunities for maritime security and surveillance. Exercise KAKADU, was held from 12 to 24 September 2016, involved 19 ships and submarines, 18 aircraft and more than 3000 personnel from 19 Asia Pacific and Indian Ocean navies and air forces.
Participating nations included Australia, Canada, Fiji, France, India, Indonesia, Japan, Malaysia, New Zealand, Pakistan, Papua New Guinea, Philippines, Republic of Korea, Singapore, Thailand, Timor Leste, Tonga, United States of America, and Vietnam.



Japanese destroyerJS Fuyuzuki conducts an approach with Australian frigate HMAS Newcastle during Exercise Kakadu 2016 © LSIS Justin Brown, Commonwealth of Australia, September 2016

RECAPITALIZING THE RAN : DESIGN THE FORCE FOR DECISIVE AND DISTRIBUTED LETHALITY

By Vice- Admiral Tim Barrett, Chief of the Australian Navy

Barrett's speech at the Williams Foundation seminar focused on the opportunities and challenges of the largest recapitalization of the Royal Australian Navy (RAN) since World War II. New submarines, destroyers and amphibious ships and associated fleet assets are being built in Australia to shape a new maritime capability for Australia.

But this force is being built in the time of significant innovation in the Pacific whereby new force concepts are being shaped, such as kill webs, distributed lethality, and fifth generation airpower.

Barrett made it very clear that what was crucial for the Navy was to design from the ground up any new ships to be core participants in the force transformation process underway.

In his presentation at the conference, he 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 Australian Defence Force (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 was the operational objective.

He noted that it is not about massing force in a classic sense; it is about shaping a force, which can maximize the adversary's vulnerabilities while reducing our own.

And he re-enforced several times in his presentation that this is not about an 'add-in, after the fact capability'; you need to design and train from the ground up to have a force trained and equipped to be capable of decisive lethality.

He quoted Patton to the effect that you fight war with technology; you win with people. It is about equipping the right way with right equipment, but training effectively to gain a decisive advantage.

New submarines, destroyers and amphibious ships and associated fleet assets are being built in Australia to shape a new maritime capability for Australia

THE AUSTRALIAN « SHIP-ZERO CONCEPT »

How do you view the challenge of building a more sustainable navy from the outset?

"I am taking a very long view, and believe that we need to build our ships in Australia to generate naval capabilities integrated within the ADF. 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. 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.

(...) It is crucial to deterrence. If your ships are not operating at sea they will have little effect. For example we have changed our approach to the Collins submarine largely around sustainment and working more openly with industry to achieve much greater at-sea operational tempos. We have put in place an enterprise approach, which focuses on availability of submarines: Industry and Navy are working closely together now to achieve that core objective.

I've got industry keenly interested in the results of what the submarines do when they leave port and go on operations. And we've had a dramatic turnaround in submarine availability as partnering has improved.

For me, deterrence, lethality, availability, sustainability, and affordability are highly interrelated for a Navy and its combat performance. And clearly as we design new ships, designing in more sustainable systems and ships is crucial.

We do and are implementing it in our new Offshore Patrol Vessel program. And with our 'ship zero' concept we are looking to integrate the various elements of operations, upgrades, training and maintenance within a common center and work flow to get greater readiness rates and to enhance an effective modernization process as well. We are reworking our relationship with industry because their effectiveness is a key part of the deterrence process. If I have six submarines alongside the wharf because I can't get them away, they are no longer lethal and they are no longer a deterrent force.

Again, as an example we have dramatically improved availability by building maintenance towers alongside the submarine—rather than the previous way that it was done, where people arrived into that one gangway under the submarine, then dispersed to do their maintenance work—is an example of how we need to work."

To the right : Collins Class Submarine HMAS Sheean as she returned to her home at Fleet Base West (FBW), Rockingham, Western Australia. Sheean departed FBW in May, conducting a variety of activities which included visits to Singapore and Darwin © CPOIS Damian Pawlenko, Royal Australian Navy, October 2016

To the left : Able Seaman Boatswain's Mate Sarah Anderson conducts a surface shoot with the 12.7mm Browning machine gun with blank ammunition, on board HMAS Glenelg during Exercise KAKADU 2016 © LSIS Jayson Tufrey, Commonwealth of Australia, September 2016

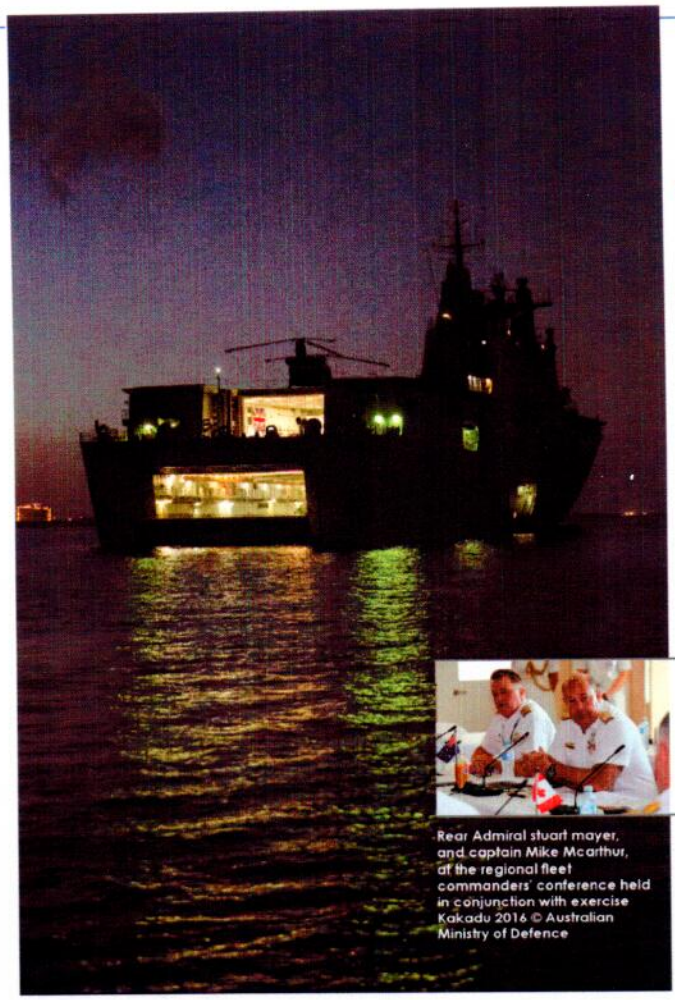
You need to design and train from the ground up to have a force trained and equipped to be capable of decisive lethality

The recapitalization effort was a "*watershed opportunity for the Australian Navy.*" But he saw it as a watershed 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 platforms, but we can do that only by shaping integrated ways to operate.*"

He highlighted that the Navy was 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.



THE NETWORK AS A WEAPON SYSTEM: JOINTNESS AS AN « OPERATIONAL NECESSITY »

An interview with Rear Admiral Mayer, Commander Australian Fleet

Rear Admiral stuart mayer, and captain Mike Mcarthur, at the regional fleet commanders' conference held in conjunction with exercise Kakadu 2016 © Australian Ministry of Defence

HMAS Adelaide's embarked LHD Landing Craft, participated in a trial alongside Australian Army's 1 BDE, to test and evaluate the recently built Multi User Barge Ramp facility in Darwin. The purpose of the trial is to capture data regarding sea lanes, tidal streams, ramp capacity and environmental constraints © LSIS Sarah Williams, Commonwealth of Australia, September 2016

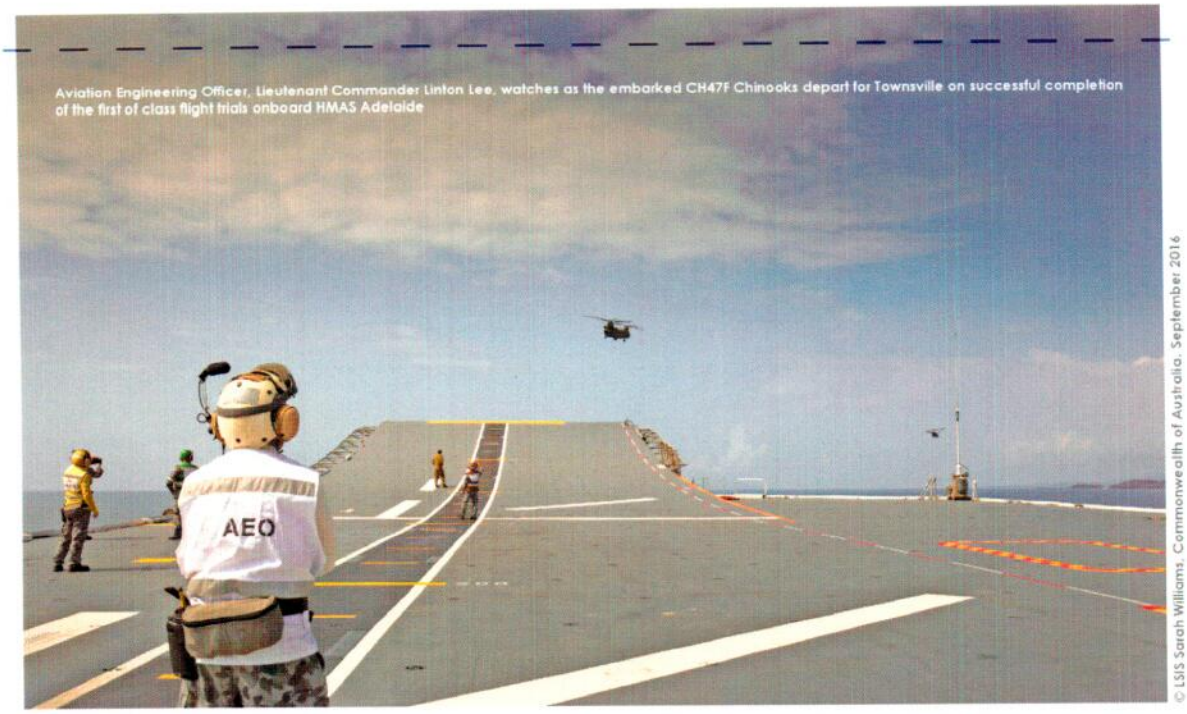
During the Williams Foundation seminar on evolving approaches to air-sea integration, Rear Admiral Mayer, the Commander of the Australian Fleet, focused on the concrete and specific challenges facing the evolution of the Royal Australian Navy as a key element of the joint force. He argued that the Army, Navy and Air forces were evolving in the context of tapping shared networks to empower their platforms to form an extended battlespace. But the challenge, he observed, was 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 highlighted that the Navy was returning to a task force concept but one, which was 21st century in character, whereby Navy was tapping into ground and air assets as "part" of the task force, rather than simply focusing on Navy operated assets.

During the seminar he characterized the network as a weapon system with "no single master" and that one of the ADFs challenges was 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 potential through the elements of a common network. There is increased overlap thereby for the air and sea forces, at the very least through the access and synergy provided in the network. A fundamental question presents itself; how should we best develop, certify and deploy our joint network that must be cross domain in nature?*"

He argued that the Australian Defence Force was on a good track but needed to enhance its capability to work in a joint domain that recognized tactical effects were generated by Services, but operational outcomes were inherently Joint.

In effect, the Services provided the muscle behind the Joint intent. If the ADF were to achieve its potential it would need to design forces from the ground up that were interconnected to a single reference standard, rather than simply connecting assets after the fact. But to do so required an open architecture approach to building a joint network that recognized the different needs of the participants. The role of the network as a weapon system required that it had to be designed, deployed and certified like any other weapon system.

We are joint by necessity. Unlike the US Navy, we do not have our own air force or our own army. Joint is not a theological choice, it's an operational necessity. The network is a weapons system



Aviation Engineering Officer, Lieutenant Commander Linton Lee, watches as the embarked CH47F Chinooks depart for Townsville on successful completion of the first of class flight trials onboard HMAS Adelaide

© LSIS Sarah Williams, Commonwealth of Australia, September 2016

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 eco system we seek if each harmonize with the other

In a separate interview he noted that the development of the new amphibious ships had come within a decade of work on shaping an amphibious warfare system. The importance of the LHDs was not just the capability they offered, but the elevation in thinking they drove in Navy over the decade, thinking that moved operational concepts from the platform to the Task Group and affected all of Navy's force elements. He emphasized throughout the interview that not enough work has yet been done to prioritize the evolving C2 and network systems empowering the platforms in the force, including but not limited to the amphibious force. He hightlighted how jointness is for the Royal Australian Navy an « operational necessity ».

"We are joint by necessity. Unlike the US Navy, we do not have our own air force or our own army. Joint is not a theological choice, it's an operational necessity. The network is a weapons system. Lethality and survivability have to be realized through a networked 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.

Achieving an effective network topology is so much more complex in a coalition context in which the potential for divergence is higher. The paradox is that a coalition network is much more likely a requirement than a national network, and yet what investment we do make is based on national systems first. If we don't achieve the open architecture design that enables the synergy of a networked coalition force, then the effectiveness of the coalition itself will be put at risk.

The moment we insert excess command and hierarchical decision authority into the loop we will slow down the lethality of the platforms in the network. Before we even get in the battlespace we have to agree the decision rights and pre-set these decisions into the combat system and network design; the fight for a lethal effect starts at the policy level before we even engage in combat operations. The network and C2 rather than the platforms can become the critical vulnerability. This is why the decision making process needs to be designed as much as the network or the platforms. If the C2 matrix slows the network, it will dumb down the platform and the capability of the system to deliver a full effect.

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 eco system we seek if each harmonize with the other, and the overall effectiveness is considered on the health of the ecosystem overall. For example, an ASW network will leverage the potential of the individual constituent platforms and that in turn will determine the lethality of the system.

A discordant network connection will, at least, limit the overall Force level effect of the network and at worst break the network down to discordant elements."

THE WAY AHEAD FOR THE ROYAL AUSTRALIAN NAVY

HMAS Warramunga sails through the Northern Australian Exercise Area during Exercise KAKADU 2016 © ABIS Kayla Hayes, Commonwealth of Australia, September 2016

An interview with Rear Admiral Jonathan Mead, Head of Navy Capability

Royal Australian Navy Officer Rear Admiral Jonathan Mead, Head Of Navy Capability, Speaks At The Chief Of Army Exercise In Adelaide, South Australia, On September 6, 2016 © Australian Ministry Of Defence

This interview discusses rear Admiral Mead's perspective on the way ahead with regard to the Navy in the overall context of the joint evolution of the ADF.

Rear Admiral Mead is the Navy's joint capability manager and is clearly focused on the cross-cutting dynamics of maritime modernization within the context of the overall evolution of the ADF.

Although the Head of Navy Capability since 2015, Rear Admiral Mead is part of the transition set in motion since April 1, 2016 to shaping a new approach to shaping joint force capability. As he put it:

"*The way the department was structured previously was capability development was centralized in a group led by joint three-star. One of the recommendations of The First Principles report was to bring those accountabilities from the center back out to Navy, Army, Air Force. Whereas previously the services had de facto a third party working it for them, now as of the first of April, it's all come back directly to the services. The Chief of Navy is accountable for all naval capability across the board from building to life cycle support to disposal of assets. The services led by the Vice Chief, is now accountable for the investment program and also for the force design and bringing the alignment capabilities of the three services together into a joint force.*"

With the launching of the White Paper, a significant modernization of the ADF was put in motion with a major build for the Australian Navy, including new submarines, air warfare destroyers and frigates.

This build will unfold within the evolving context of the overall transformation of the Australian Defence Force, which highlights shaping an integrated force able to operate in the extended battlespace.

A key element of the rethink is with regard to how you are thinking about the new assets in terms of task force operations. Could you discuss the new amphibious ships from this perspective?

The ship itself provides the government an

Romeo Flight Two prepares to launch the embarked MH-60 Romeo helicopter onboard HMAS Warramunga during Exercise KAKADU 2016 © ABIS Kayla Hayes, Commonwealth of Australia, September 2016

enormous array of options and flexibility, but we have no intention of deploying the ship by itself. Our philosophy is to deploy in task groups, but in a flexible manner.

The new submarines and their combat systems will clearly be designed effectively to tap into the maritime warfare network

The amphibious ships are clearly going to anchor any amphibious task force, but those task forces will employ a mix and match capability of air, land and sea assets.

And we are looking beyond a classic understanding of an amphibious task force role for these ships, for they could operate as C2 ships in an ASW effort with embarked helos on board, and integrated with the P-8s, Tritons and other assets as well.

And that will be true of how we will use the new air warfare destroyers as well, providing C2 and support capabilities for integrated air-land-sea missile defense or be the lead in such an effort.

As you build the new submarine and its combat system, there is an interest for that submarine to tap into the information network, which the ASW force can provide for it. How do you view that process?

Obviously, the silent service wishes to operate in such a manner that two-way communication does not compromise its operations.

But equally obvious, is that the new submarines will operate in such a manner that they can tap into the evolving ASW network and have its combat systems benefit from that data input to maximize its mission success.

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.

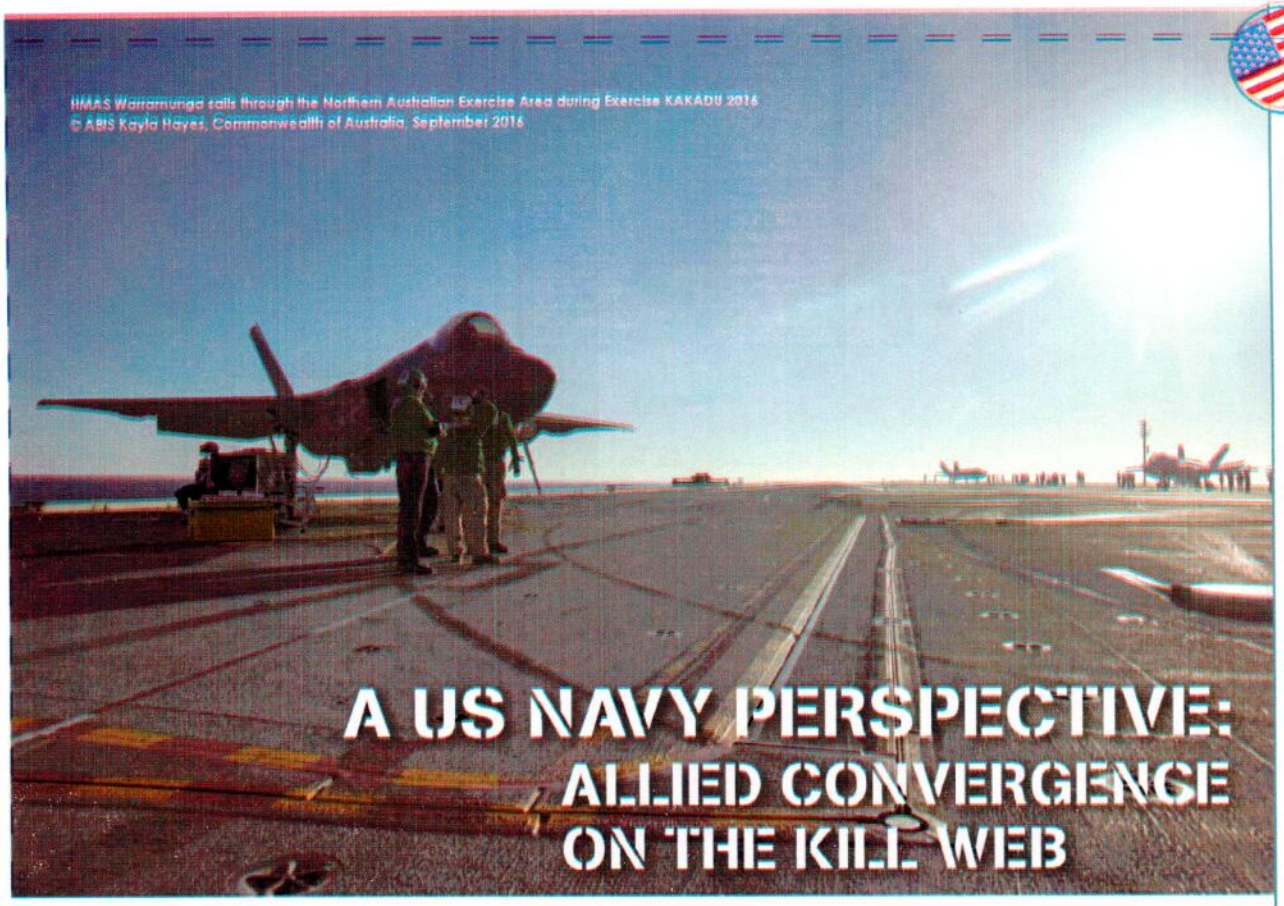
How do you bring coherency to the diverse programs you are managing?

In my front hallway, there is a large diagram — it's about three meters in length and about one half meters wide — and it articulates all the major capability programs we've got on the way now and how they're connected.

My job is to try and bring a sense of coherency to that program. I do drill down to individual projects and some have very short timelines.

But in the main, we are adopting a programmatic approach to navy capability.

We are looking to maximize efficiencies and to work effectively in partnership with industry to do so. It is a challenge.



HMAS Warramunga sails through the Northern Australian Exercise Area during Exercise KAKADU 2016
© ABIS Kayla Hayes, Commonwealth of Australia, September 2016

A US NAVY PERSPECTIVE: ALLIED CONVERGENCE ON THE KILL WEB

Rear Admiral Manazir during his presentation At The Seminar

An interview with Rear Admiral Manizir,
Deputy Chief of Naval Operations for Warfare Systems (OPNAV N9)

The lead off speaker at the Williams Foundation seminar on air-land integration was Rear Admiral Manazir.

Rear Admiral Manazir currently serves as the deputy chief of naval operations for warfare systems (OPNAV N9) on the staff of the US Navy chief of naval operations. In this capacity, he is responsible for the integration of manpower, training, sustainment, modernization and procurement of the Navy's warfare systems.

His presentation focused on the strategic context for the U.S. and allied maritime forces and shaping a convergent way ahead and highlighted both the significance of the maritime domain for commercial operations and the emergence of peer competitors within that domain. The U.S. and its allies are clearly concerned that the freedom of the seas, and rule of law be exercised by the global maritime nations.

Equally obvious is the concern that rival maritime powers are committed to their own interpretation of the rules of the road and are building capabilities to seek to implement their will in the maritime domain. The question is how can the Allies shape convergent capabilities to ensure that the global commons remain open, and not controlled by powers seeking to enforce their will against the allied powers?

Rear Admiral Manazir highlighted the kill web approach as a way to shape more effective integration of force and convergence of efforts.

The kill chain is a linear concept that is about connecting assets to deliver firepower; the kill web is about distributed operations and the ability of force packages or task forces to deliver force dominance in an area of interest. It is about building in integration from the ground up so that forces can work seamlessly together through multiple networks, rather than relying on a single point of failure large network.

Rear Admiral Manazir was part of an Australian and Allied re-think about the way ahead.

The Afloat Forward Staging Base (Interim) USS Ponce (ASB(I) 15) conducts an operational demonstration of the Office of Naval Research (ONR)-sponsored Laser Weapon System (LaWS) while deployed to the Arabian Gulf. © John F. Williams, US Navy, November 2014

In the interview below conducted in the aftermath of the Canberra seminar by Robbin Laird and Ed Timperlake, the head of N-9 discusses how he saw the way ahead, including the inclusion of directed energy weapons within the fleet.

The core commonality between the two is that both are expeditionary services. When we get into the battle area, Air Force assets can strike, reset and strike again. Naval forces operating in the maritime domain provide persistence

The new Chief of Staff of the USAF, General Goldfein, seems to be focused on issues in ways that the CNO is as well. For example, General Goldfein focused on the moral imperative of training for the high end fight. He has highlighted the importance of innovation in C2, including distributed C2. How do you view the USAF and USN overlap?

The question that drives my response to the challenge is how do we achieve distributed effects across all domains in the battlespace? We are working closely with General Goldfein through various Service interaction groups; most effectively at the highly classified level. We talk about issues that are common to our Services on a regular basis.

The core commonality between the two is that both are expeditionary services. When we get into the battle area, Air Force assets can strike, reset, and strike again. Naval forces operating in the maritime domain provide persistence. If you combine Air Force and Naval combat capabilities you have a winning combination. If you architect the joint force together, you achieve a great effect.

It is clear that C2 (command and control) is changing and along with it the CAOC (Combined Air and Space Operations Center). The hierarchical CAOC is an artifact of nearly 16 years of ground war where we had complete air superiority; however, as we build the kill web, we need to be able to make decisions much more rapidly.

As such, C2 is ubiquitous across the kill web. Where is information being processed? Where is knowledge being gained? Where is the human in the loop? Where can core C2 decisions best be made and what will they look like in the fluid battlespace?

The key task is to create decision superiority. But what is the best way to achieve that in the fluid battlespace we will continue to operate in? What equipment and what systems allow me to ensure decision superiority?

The Impact of Directed Energy Weapon On The US Navy

Any vehicle which can be a source of space, weight, power and cooling, with enough capability to generate and hold the power needed to employ directed energy weapons can be a useful platform for directed energy in the future fight.

More generally, directed energy weapons are part of our overall transformation in the weapons enterprise. Directed energy weapons are fifth generation weapons. Directed energy weapons, coupled with other new types of weapons, are critical to empowering a distributed force.

We need directed energy weapons as adjuncts to our current kinetic weapon systems in order to turn the cost curve our way. For example, we shoot down cruise missiles that cost a couple hundred thousand dollars with $3 million defensive missiles. Our weapons are very effective, but we shoot a $3 million round every time we use them.

We are working to build synergy among electronic attack, directed energy and kinetic weapons to shape an interactive and integrated capability for the distributed force.

We are moving towards funding a directed energy plan which would enable us to move towards implementing interim directed energy laser capability between now and 2020.

There's a 30-kilowatt laser on USS PONCE right now. It's in the Arabian Gulf and it works. It works very well. As you know, lasers can be used for communications. They can be used for ISR. They can obviously be used for non-kinetic effects.

In order to have the higher-end kinetic effect, you have to have the space for the weight of the laser itself, the power for it, and then the cooling-wherever the source.

Obviously, with a ship in the water, you have an unlimited source of cooling water. Then, in order to have a very, very deep magazine for a laser shot, you either have to have a constant source of fairly high electrical power, or you have to have a very large battery. We are not waiting until we have what many see as the ultimate goal, a one megawatt laser weapon; we would like to build capability incrementally.

Over time we will be able to field higher and higher power laser weapons. It is about putting it into the fleet and evolving the capability; it is not about waiting until we have the optimal weapon. We need not just the weapon, but the training and the tactics shaped by the fleet to provide inputs to how best to integrate the capability into the force.

However, directed energy weapons are only a part of this new way of thinking. The key is continually evolving combinations of capabilities that enhance the defensive and offensive power of the platforms that you put into the kill web. We are very focused on the evolving man-machine relationship, and the ability of manned and unmanned systems, as well as kinetic and non-kinetic systems, to deliver a broader spectrum of capability to the force.

We are creating a force for distributed fleet operations. When we say distributed, we mean a fleet that is widely separated geographically capable of extended reach.

Importantly, if we have a network that shares vast amounts of information and creates decision superiority in various places, but then gets severed, we still need to be able to fight independently without those networks.

This requires significant and persistent training with new technologies but also informs us about the types of technologies we need to develop and acquire in the future. Additionally, we need to have mission orders in place so that our fleet can operate effectively even when networks are disrupted during combat; able to operate in a modular-force approach with decisions being made at the right level of operations for combat success.

When you were in Australia, you highlighted that Allies such as the Australians and British who were participating with you in the Williams Foundation Conference, were on the same page with regard to the way ahead. How important is that for the US Navy and Marine Corps team?

Crucial. In effect, when we can operate together in this new environment and work from the same page, we can support core allies or allies can support us in the battlespace. We can function as each other's wingman.

We are moving from a platform-centric mindset to a capability-centric mindset. For instance, when we talk about the F-35 we are focused not simply on the platform but how that F-35 empowers and fits into the distributed networks or kill webs.

It is the outcome and effect we are focused on. If we're going to fight next to each other, the force (as an evolving distributed capability) has to understand how to employ their weapons systems, including how to best leverage the F-35, rather than just relying on the pilot that is flying the F-35 understanding what it can do.

The rules of engagement (ROE) need to keep up with the technology. An F-35 is going to have electronic means that can affect somebody a long way away. We didn't have those electronic means before, and so the ROE should be able to allow us to employ weapons based on the technology that we have.

To keep up with technology is a key point, but it goes all the way back to when the bad guys are successful snipping parts of the network, you need to have mission orders that are effective and I am confident we are training with that in mind.

when we can operate in this new environment and work from the same page, we can support core allies or allies can support us in the battlespace. We can function as each others' wingman

http://www.royalnavy.mod.uk/queenelizabeth

AN UPDATE ON THE QUEEN ELIZABETH CLASS CARRIER

Presentation and Interview With Captain Nick Walter, Royal Navy

The carrier is being introduced from the ground up as a joint asset, not simply a maritime asset

During the Seminar, Captain Nick Walker of the Royal Navy, who is on the Naval Staff, provided an overview on the Queen Elizabeth Class carriers and their role in the transformation of the UK forces. His presentation highlighted that the impact of the new carriers was joint through and through and was about empowering the British defense force to operate throughout the spectrum of conflict. It was about not simply adding a new ship, but shaping a networked enabled capability able to operate to serve national interests or to support coalition operations.

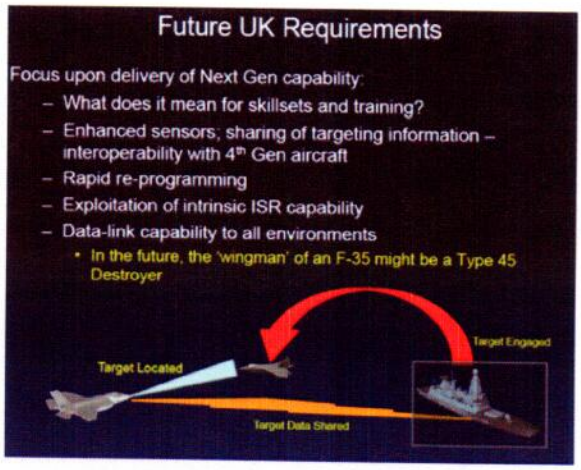
In a separate interview conducted as he was part of a RN and RAF team discussing the carrier and strike aviation at Whitehall in the first quarter of 2014, Captain Walker underscored the impact of this new capability for the national decision makers, as it both triggered and reflected the transformation process for the UK power projection forces. He was then Commander Nick Walker and serving as the Chief of Staff Carrier Strike in the Carrier Strike and Aviation Division within Navy Command Headquarters in Portsmouth.

He underscored that both the F-35 and the carrier are being brought into service together, and together they are key definers of the new power projection approach for an information age. The carrier is being introduced from the ground up as a joint asset, not simply a maritime asset. He noted that the role of Special Forces has been highlighted since this original statement and will be folded into the revised statement of intent with regard to the role of the carrier within the UK forces. As a matter of fact, Carrier Enabled Power Projection (CEPP) has been maintained within the Ministry of Defence. This is in distinction to most other capabilities, which have been given to the front line commands. This allows joint forces command and the services to focus on CEPP as a joint capability.

The deck of the Queen Elizabeth carrier is 85% of the size (i.e. area) of a Nimitz class carrier; which can carry up to 36 F-35Bs along with a Merlin Crowsnests and a Merlin Mk2 ASW helo. Alternatively, the ship can be used in the projection of land forces from the sea in terms of Marines and helo insertion capabilities as well. But it is the carrier

The Carrier Strike Journey: « Building Interoperability From the Ground Up »

« This evolving capability will give the decision maker a lot of flexible tools to respond or prepare for crises. The Maritime Task Force can be well integrated with land based air, but does not need a lot of forward ground presence to generate combat effects. This can give decision makers significant flexibility with regard to a crisis or to have the ability to move to crises rather than having to generate force build up in a particular place in order to intervene.



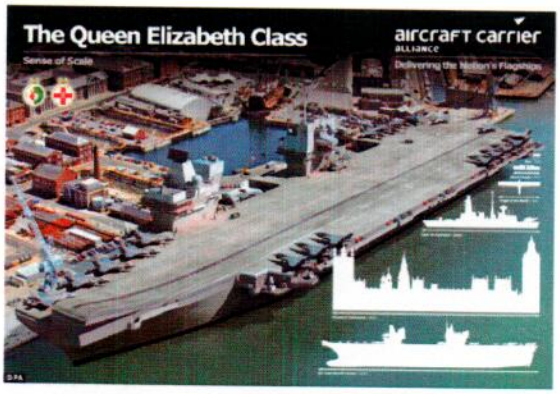
SLIDE FROM PRESENTATION BY CAPTAIN WALKER TO THE SEMINAR

The carrier strike journey is driving significant cultural change in the forces as well. An integrated and sustainable joint capability, which is interoperable with NATO, enables the projection of UK Carrier Strike and Littoral Manoeuvre power, as well as delivering humanitarian assistance and defence diplomacy, enabling joint effect across the maritime, land and air environments at a time and place of political choosing. We have indeed built from the ground up interoperability, and have worked closely with the USN and USMC with regard to this capability. We are working on a broader approach to NATO interoperability as well.

A key cultural change is that we are looking at air and maritime as an integrated domain; and we are looking at the interaction among the environmental seams of our forces. (...) We need to shape a more mission order vice a directive Air Tasking Order approach to the use of an integrated air-maritime force. We are examining how best to shape the desired outcome from nodes in the operational force, rather than focusing on specialized platforms. How do we generate operational tasks to be delivered from the integrated force?

Rapid reprogramming of platforms is a crucial way ahead for sure. The ability to exploit the intrinsic ISR capability of the force, rather than simply relying on specialized ISR platforms is a key way ahead as well. The ability to deliver effect throughout the force with data-link capabilities such as in the future the wingman of an F-35 could well be the Type 45 destroyer... »

As seen in :http://www.queenelizabethcruises.net/wp-content/uploads/2014/01/HMS-Queen-Elizabeth-deck-plan.jpg



http://www.dailymail.co.uk/news/article-2258574/New-aircraft-carriers-HMS-Queen-Elizabeth-HMS-Prince-Wales-largest-warships-built-Royal-Navy.html

strike focus, which is definitional for the new carrier, as the ship has been designed from the ground up to support F-35B, in terms of weapons, C2, and ISR integration.

Captain Walker provided an overview of the timing of the build out of the ship and the process of marrying it with the movement of the UK F-35Bs being prepared and trained in the United States to its permanent location in the UK at RAF Marham. The initial carrier IOC is projected to be December 2020 with the fully integrated F-35 and carrier having full operational capability by 2025.

The UK is looking at the evolving impact of introducing carrier strike upon the overall change in the RAF and Royal Navy as well, a key aspect of this transformation being the evolving integration of fifth gen upon legacy capabilities. Captain Walker highlighted the shift from a legacy mindset, which focused on thinking of maritime versus air environments to an integrated information dominance environment.

TOWARDS A NEW INDUSTRIAL-GOVERNMENT RELATIONSHIP : Integration as a Force Multiplier

By John Conway, Raytheon Australia

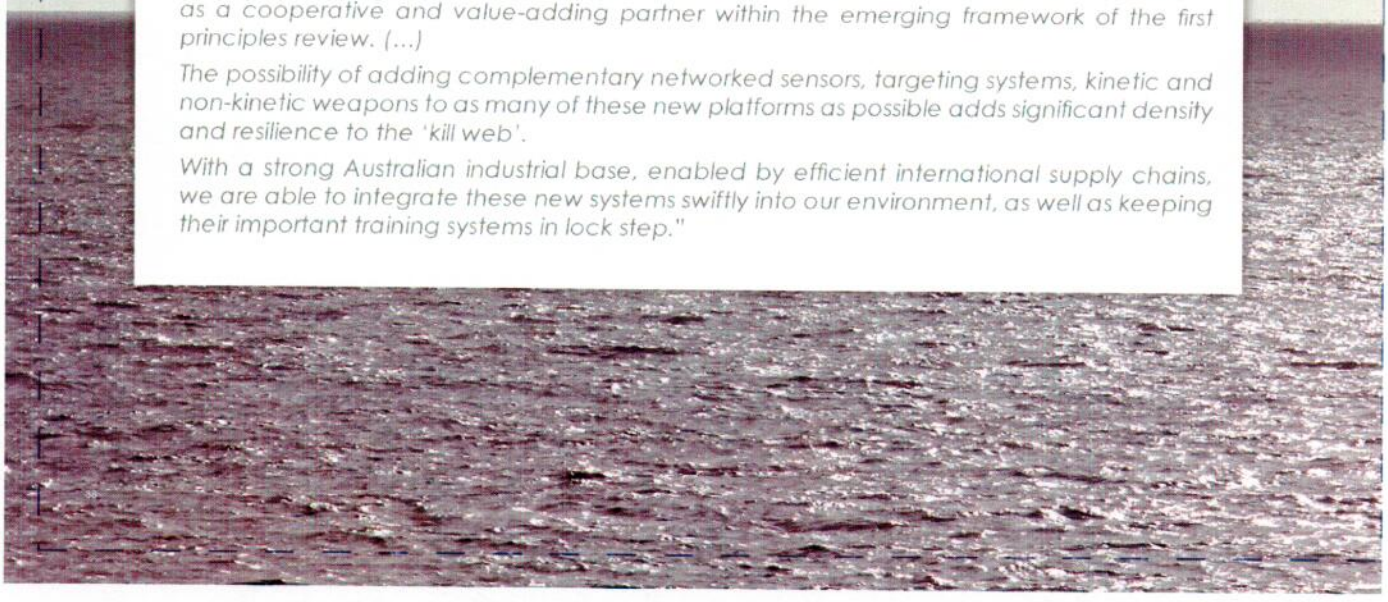
During the Seminar, John Conway focused on what he sees as a key role for industry in Australia, namely working with the Commonwealth to ensure that the ADF has sovereign control over its combat technologies. The latest Defence White Paper and associated documents call for a new working relationship with industry and throughout his remarks Conway underscored the importance of reworking the relationship to achieve greater force integration and cohesion. He highlighted that the addition of the new platforms provides key opportunities for working the partnership towards greater force integration.

"Integration should be viewed from the outset as an essential force multiplier in the air-sea domain, with the Australian defence industry playing a fundamental role in supporting the design, building and sustainment of a potent and agile joint force capability. (...)

With Australian industry now formally acknowledged as a fundamental input to capability, this places a significant responsibility upon us to synchronize with Commonwealth intent, contribute to the development of effective and efficient time-sensitive solutions, and act as a cooperative and value-adding partner within the emerging framework of the first principles review. (...)

The possibility of adding complementary networked sensors, targeting systems, kinetic and non-kinetic weapons to as many of these new platforms as possible adds significant density and resilience to the 'kill web'.

With a strong Australian industrial base, enabled by efficient international supply chains, we are able to integrate these new systems swiftly into our environment, as well as keeping their important training systems in lock step."



WHY DCNS WON THE COMPETITION : understanding the path to Sovereignty

An interview with Brent Clark, Director of Strategy at DCNS Australia

Brent Clark is an experienced submariner with the Royal Australian Navy. After his service with the Navy, he went into industry where he continued to work on naval systems, including working for Thales Naval Systems in Australia. When DCNS Australia was created in early 2015, Clark joined the company to help guide the competitive bid for what would become the winning submarine bid earlier this year.

Brent Clark emphasizes in the interview below that the 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 which their industry could build and support in a sovereign manner.

The competition was among Japanese, German and the DCNS platform. And of these, only the French company had long standing experience in diesel submarines and in operating a submarine at the range and distance which Australia wanted.

With the signing of the design contract between DCNS and Australia, Australian technicians are to 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 go down as the Australians ramp up their manpower numbers in the submarine build process.

Sustaining the Distance

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 and that is the United States and France. If Australia wants to learn what sovereignty in this area means, they clearly have to work with a nation which does know and exercises such capabilities.

The French have 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

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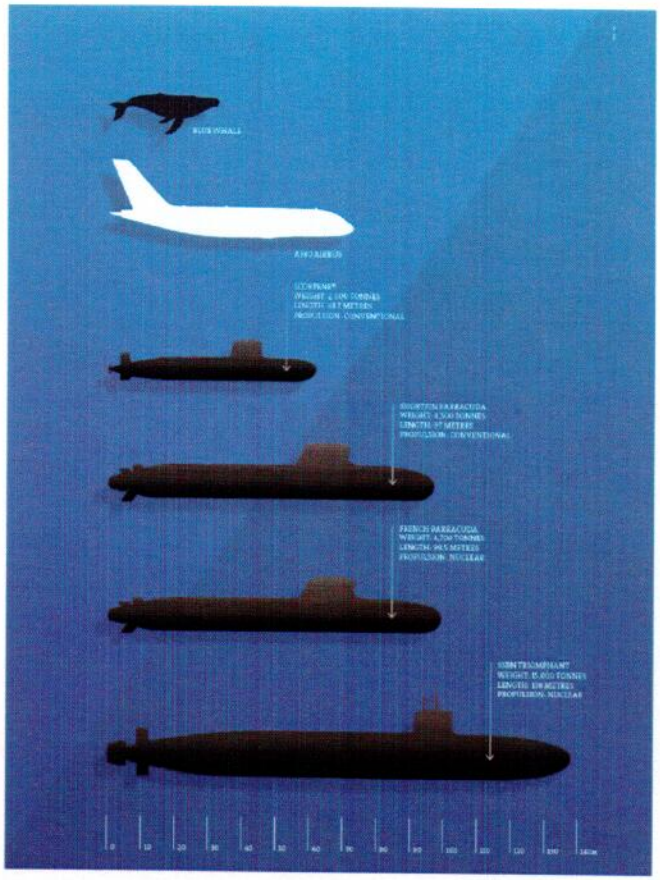

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currently. France deploys its submarines into the Western Indian Ocean and operates on long deployments similar to Australia or the United States. In contrast, Germany and Japan operate their submarines at sea for about a month at a time. Being able to support and sustain longer deployments is crucial to Australia for its next generation submarine as well.

We were therefore very confident of the operating cycle of the submarine, as well as 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.

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 Scorpene class submarines

Transferring Knowledge

The company is very good at transferring technology, which was a requirement for Australia. 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 Scorpene class submarines. You don't have to go back to France for anything if you don't wish to.

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 with shipyards is 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, which is safer with more productivity as well.

Where the requirement for French supervision starts to end really depends on how quickly we can get the Australian workforce to be trained.

We have said the three entities - DCNS, the CSI[2] and the Commonwealth - must work together to deliver a whole warship performance. We are going to co-contract with the CSI for performance.

If we go back to the combat system on Collins which was basically supplied as government-furnished equipment, GFE, to the builders, 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.

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.

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[1] See also on www.sldinfo.com : Building a New Class of Submarines for the Royal Australian Navy: The Perspective of DCNS Australia ; Building a New Class of Conventional Submarines: The Australian Case.

[2] The Combat Systems Integrator (CSI) has been selected on September 30th, 2016 by the Australian Minister for Defence, Marise Payne : Lockheed Martin was picked.

TO KNOW MORE

THE DEFENCE WHITE PAPER ON MARITIME SYSTEMS

The following is taken from the 2016 Defence White Paper with regard to the general discussion on the way ahead with regard to maritime capabilitie.

Highly capable and versatile naval and maritime forces are vital to our defence strategy.

Australia's naval and maritime forces must be able to undertake a wide range of activities in support of the Strategic Defence Objectives and operate across huge distances.

The area of Australia's maritime zones, including our Exclusive Economic Zone, is one of the largest in the world, with a total marine area of around 10 million square kilometres.

Australia is also responsible for covering one of the largest search and rescue areas in the world, some 53 million square kilometres of the Indian, Pacific and Southern Oceans.

Our naval and maritime forces deploy around the world for training, exercises and to participate in coalition operations to support the rules-based global order.

Modernising our maritime capabilities will be a key focus for Defence over the next 20 to 30 years.

Our maritime forces will become more potent through the acquisition of more capable submarines, ships and aircraft and better integration of combat and supporting systems across Defence. These forces will help to protect our maritime borders, secure our immediate northern approaches and proximate sea lines of communication and enable us to project force in the maritime environment Increasingly, these capabilities will provide an ability to undertake anti-submarine warfare throughout the maritime environment.

Defence's ability to contribute to border protection will be enhanced with the introduction of larger, more capable offshore patrol vessels with greater range, endurance and improved carrying capacity and a new large-hulled multi-purpose patrol vessel, the Australian Defence Vessel Ocean Protector.

The Government will invest in enhancements to multiple layers of the maritime surveillance system including new manned and unmanned aircraft.

Submarines

Submarines are an essential part of Australia's naval capability, providing a strategic advantage in terms of surveillance and protection of our maritime approaches.

The Government has determined that regionally superior submarines with a high degree of interoperability with the United States are required to provide Australia with an effective deterrent, including by making a meaningful contribution to anti-submarine warfare operations in our region.

The key capabilities of the future submarine will include: anti-submarine warfare; anti-surface warfare; intelligence, surveillance and reconnaissance; and support to special operations.

The Government will increase the size of the submarine force from six to 12 boats. The doubling in size of the submarine fleet recognises that Australia will face a more challenging maritime environment in the decades ahead.

By 2035, around half of the world's submarines will be operating in the Indo-Pacific region where Australia's interests are most engaged. Australia has one of the largest maritime domains in the world and we need the capacity to defend and further our interests from the Pacific to the Indian Oceans and from the areas to our north to the Southern Ocean. Submarines are a powerful instrument for deterring conflict and a potent weapon should conflict occur.

Australia's new submarines will be supported by upgrades to enablers and facilities such as wharves and port facilities, as well as simulators, training and submarine rescue systems. The key strategic requirements for the future submarines include a range and endurance similar to the Collins Class submarine, sensor performance and stealth characteristics which are superior to the Collins Class, and upgraded versions of the AN/BYG-1 combat system and Mark 48 MOD 7 heavyweight torpedo jointly developed between the United States and Australia as the preferred combat system and main armament. The new submarines will have advanced communications systems to link with other Navy ships and aircraft to conduct anti-submarine warfare operations.

The acquisition of the 12 future submarines will commence in 2016 with the first submarines likely to begin entering service in the early 2030s. Construction of the 12 new submarines will extend into the late 2040s to 2050 timeframe. The length of the construction process will mean that Australia will need to be planning the follow-on submarine well before the last new submarine enters service.

To ensure no capability gap and the ability to progress development of a replacement submarine in the 2050s, the Government has decided to implement a rolling acquisition program for Australia's submarine fleet. A rolling acquisition program will ensure that Australia is able to maintain a fleet of 12 regionally superior submarines as submarine and anti-submarine technologies develop over the coming decades.

During the long life of the new submarines, the rapid rate of technological change and ongoing evolution of Australia's strategic circumstances will continue. As part of the rolling acquisition program, a review based on strategic circumstances at the time, and developments in

TO KNOW MORE

submarine technology, will be conducted in the late 2020s to consider whether the configuration of the submarines remains suitable or whether consideration of other specifications should commence.

The future submarine program is the largest defence procurement program in Australia's history. The Government has already committed to maximising Australian industry involvement in the submarine program, without compromising cost, capability, schedule or risk. The Government will announce the results of a Competitive Evaluation Process in 2016

The Government will also continue to make appropriate investments in the existing Collins Class fleet, including priority capability enhancements, obsolescence management and fleet sustainment, to ensure Australia's potent and agile submarine capability is maintained until the introduction of the future submarine fleet. This will include upgrades to the Collins Class communications and sensor capabilities.

This investment will build on recent improvements to Collins Class availability In 2011–12, Collins Class availability was about half that of the international benchmark and in the past there had been up to three submarines undergoing long-term maintenance. Following the 2012 Coles Review and implementation of a comprehensive and innovative transformation plan, there has been a major improvement in the availability of the Collins Class, and Defence is on track to reach the international benchmark for submarine availability by mid-2016.

By mid-2016, the submarine HMAS Farncomb will have completed the first two-year full cycle docking in Adelaide – a maintenance activity that formerly took over three years to complete. From then onwards only one Collins Class submarine will be in Adelaide for full cycle docking Defence will continue to work closely with industry to implement reforms to optimise Collins Class availability, reliability and capability.

Surface Vessels

Surface vessels will continue to play a critical role in protecting our sovereignty, maintaining presence and projecting force into the region and beyond. They are an important component of our joint force and will operate as a highly integrated part of our force with enhanced situational awareness, communications and data sharing between maritime, air and land-based systems.

Our surface vessels must be capable of independent Australian operations, as well as operating in coalition taskforces They must also contribute to a wide range of whole-of-government priorities, including border security, search and rescue, and humanitarian assistance and disaster relief operations.

Key elements of new naval capability will include 12 major surface vessels. The three Hobart Class Air Warfare Destroyers to enter into service in the early 2020s will provide Australian or coalition maritime task groups with defence against air and missile attack. The Hobart Class will be equipped with new advanced surface to air missiles to enter service by the middle of the next decade. Nine new future frigates optimised for anti-submarine warfare will be introduced into service from the late 2020s to replace the existing fleet of eight Anzac Class frigates, with construction to start in 2020.

The Government will acquire 12 new offshore patrol vessels that will provide greater reach and endurance than the existing Armidale Class patrol boat fleet. The new vessels will be capable of undertaking several different roles including enhanced border protection and patrol missions over greater distances than is currently possible with the existing patrol boat fleet, with construction to start in 2018. All 12 offshore patrol vessels will be delivered by 2030 The Armidale Class will be supplemented by additional patrol craft as required until they are replaced by the offshore patrol vessels, to ensure there is no gap in Navy's border protection capability.

The mine countermeasures and military hydrography capability will be updated to support the future force. The life of four of the current Huon Class mine hunters will be extended while new technologies are developed to counter the threat of maritime mines Defence will seek to replace the hydrographic capability with an efficient combination of military and commercial hydrographic and oceanographic survey capabilities.

Capability Priorities

Eight P-8A Poseidon maritime surveillance and response aircraft will be introduced in the early 2020s, with seven additional aircraft to be acquired in two tranches to bring the total to 15 aircraft by the late 2020s. These aircraft have a range of over 7,500 kilometres, and can be refuelled in the air by Australia's KC-30A air-to-air refuelling aircraft, extending their range even further In addition to being able to undertake sophisticated surveillance operations at great distances, the P-8A can undertake offensive operations against submarines and ships, as well as supporting search and rescue operations.

To complement the surveillance capabilities of the Poseidon, the Government will acquire seven high altitude MQ-4C Triton unmanned aircraft from the early 2020s as part of the Intelligence, Surveillance and Reconnaissance capability stream. The Triton is an unarmed, long-range, remotely piloted aircraft that will operate in our maritime environment, providing a persistent maritime patrol capability and undertaking other intelligence, surveillance and reconnaissance tasks Short-range maritime tactical unmanned aircraft will be acquired to improve the situational awareness of our ships on operations.

Currently entering into service, 24 MH-60R Seahawk naval combat helicopters will enhance the anti-ship and anti-submarine warfare operations undertaken by our destroyers and frigates Navy will also employ MRH-90 utility helicopters, and will work closely with Army for amphibious operations.

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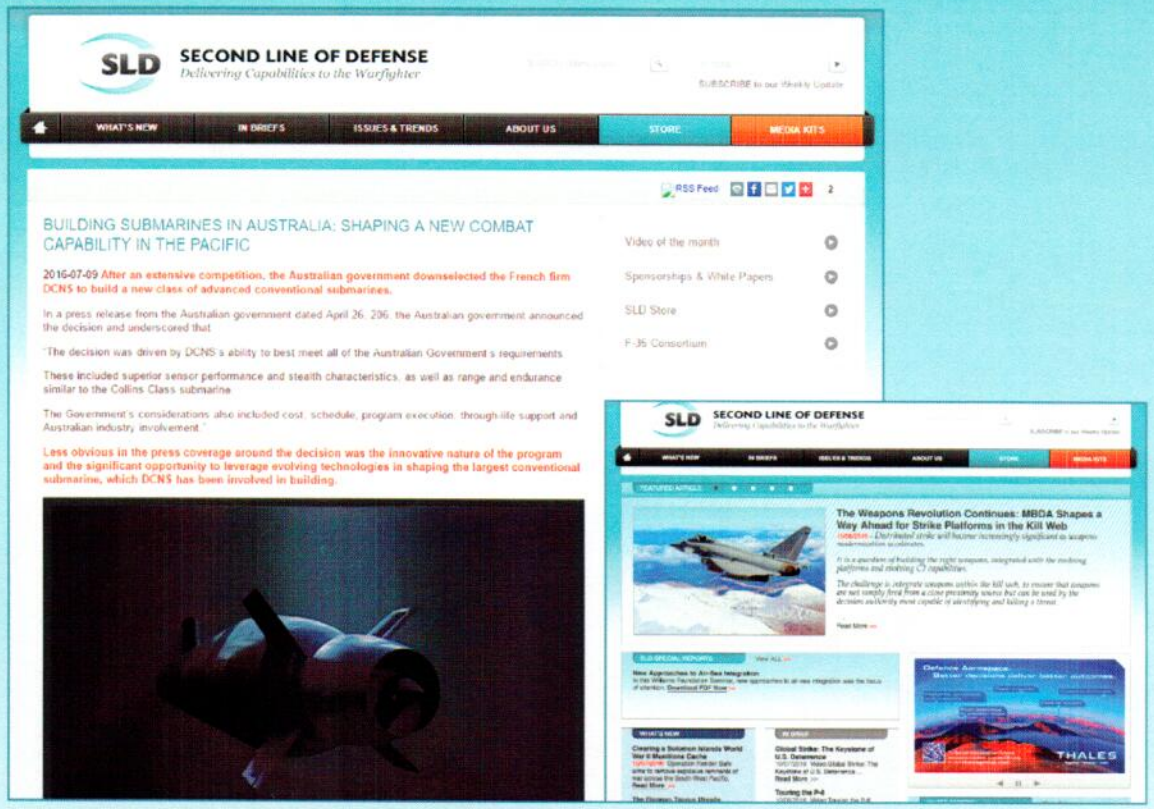

The staff of Second Line of Defense would like to thank the men and women of the Australian Defence Force for their contributions to American and European security although they serve far from home, they have never forgotten their global role and responsibilities.

It would be easy to be an island continent and ignore the world around them.

The Australian Air Task Group (ATG) of Operation OKRA is operating at the request of the Iraqi Government within a US-led international coalition assembled to disrupt and degrade Daesh operations in the Middle East Region (MER). The ATG comprises six RAAF F/A-18A Hornet fighter aircraft, an E-7A Wedgetail airborne command and control aircraft, and a KC-30A Multi-Role Tanker Transport air-to-air refuelling aircraft. Additionally, the ATG has personnel working in the Combined Air and Space Operations Centre, and embedded with the 'KingPin' US tactical Command and Control Unit © Staff Sergeant Kentavist Brackin, Commonwealth of Australia, March 2016

Australian Defence Force personnel have joined thousands of French military personnel marching down the famous Avenue des Champs-Élysées in Paris on Thursday, 14 July 2016 to mark French National Day celebrations in France. ADF personnel took the 'position of honour' at the head of the parade, which is Europe's oldest and largest regular military parade, before travelling to the Western Front in northern France for Centenary of Anzac commemorations of the battles of Fromelles and Pozières later in July.

The 140-person ADF contingent included 30 Royal Australian Navy sailors, 80 Australian Army soldiers and 30 Royal Australian Air Force airwomen and airmen, and a tri-service flag party carrying the Australian national flag and the ADF Ensign © SGT Janine Fabre, Commonwealth of Australia, July 14th, 2016