

NAVY OUTLOOK

2020



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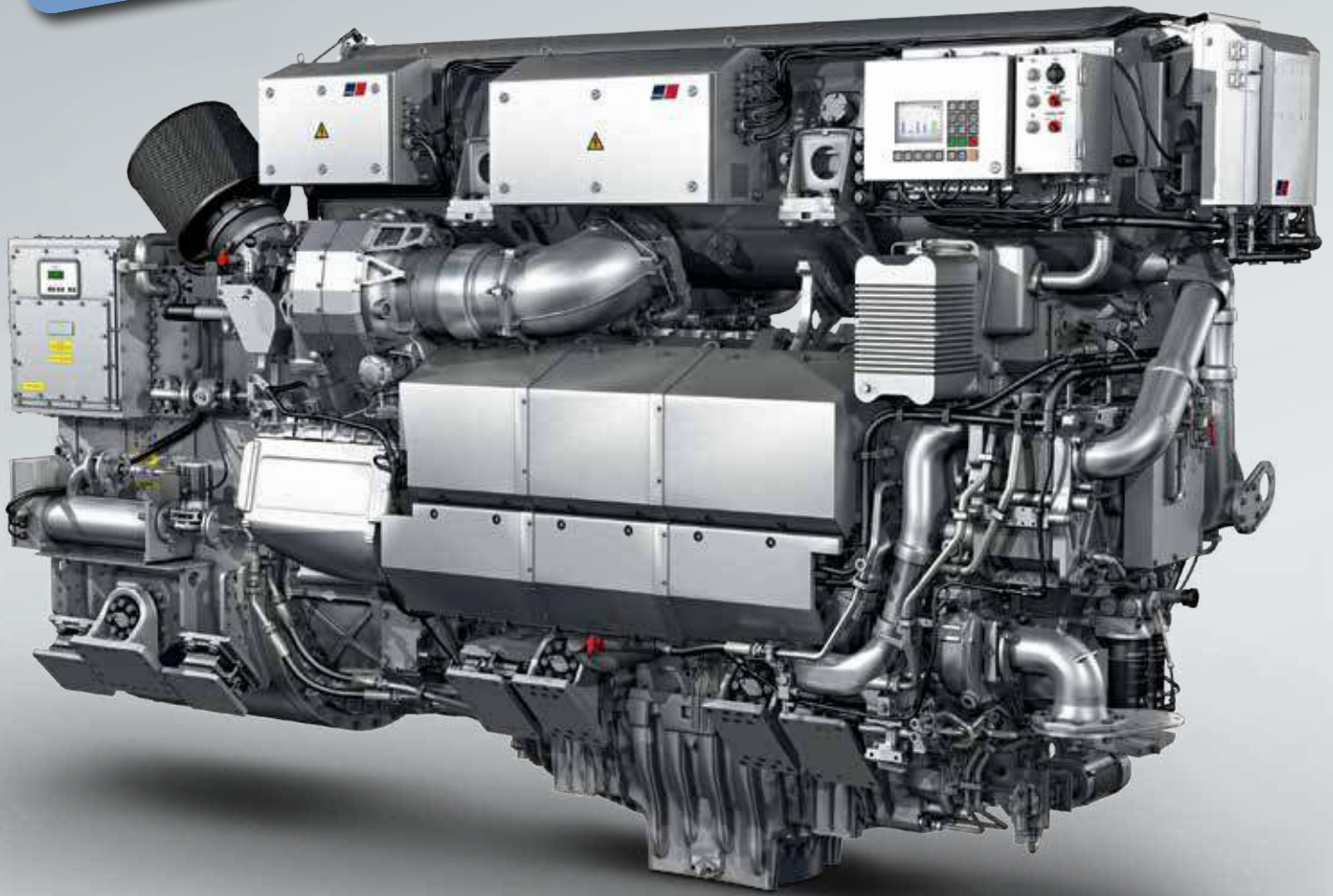
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INTERVIEW WITH VICE ADMIRAL MICHAEL NOONAN, AO, RAN

CHIEF OF NAVY



Vice Admiral Michael Noonan, AO, RAN, was appointed Chief of Navy on 7 July 2018 after 34 years at sea and in a variety of command appointments ashore and afloat. His job is to be the government's principal naval advisor and to raise, train and sustain Australia's naval forces. His time in command has seen wide-ranging changes in the Navy and the development of new operational capabilities. Now into the third year of his four-year appointment, he spoke to Navy OUTLOOK's Gregor Ferguson.

Your slogan 'A Thinking Navy, A Fighting Navy, An Australian Navy' looks good, but what's the thinking behind it?

It's pretty simple really – it really represents the tangible description of what our Navy needs to be ready to do. It's something that our Navy people understand and can relate to, and I think it also encapsulates

the spirit of what we do. We have to win because there are no prizes for coming second in our business.

What does Thinking, Fighting, Australian Navy look and behave like?

For me, it is really about capturing that spirit of what we are and what we need to be into the future. We need to be a professional and sustainable group of Navy People who in the individual sense are a reflection of Australian society, of ordinary Australian people, but when we come together, we need to be extraordinary – and we are extraordinary.

What's changing in Australia's strategic circumstances that's focusing your attention?

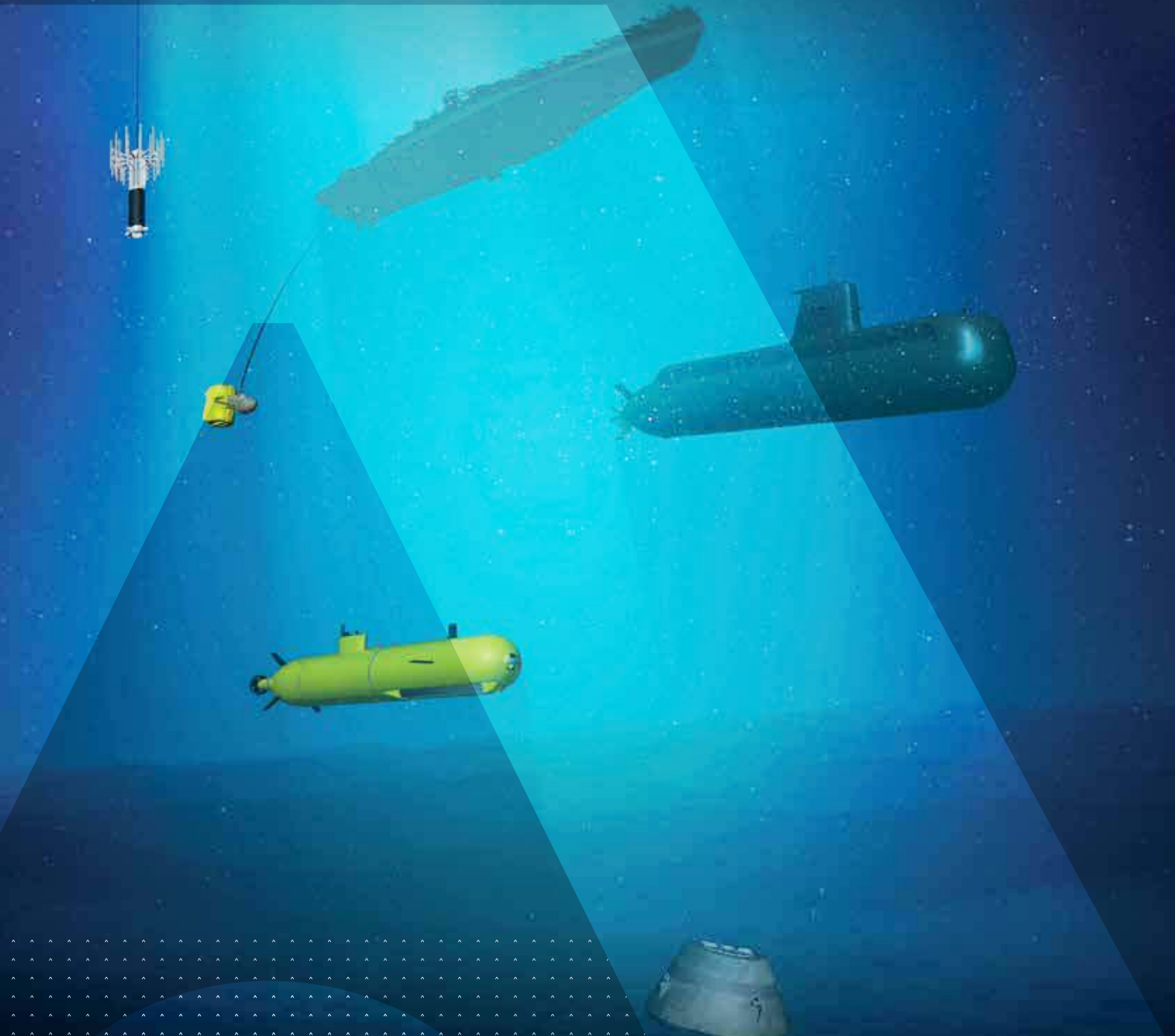
I think it's well known that global competition, particularly in our near region, has changed significantly over the past few short years and this is most definitely reflected in the maritime domain. We're in one of the most dynamic regions in the world and even the term Indo-Pacific is a relatively new construct as it describes the coming together of the Indian and Pacific regions, the oceans, of which Australia sits right in the middle. Ensuring we've got a rules-based global order in which we can operate is really important. As Chief of Navy, my focus is very firmly set upon what we need to do

as a Navy and a nation to ensure Australia's security and prosperity as tied to the maritime domain.

The Navy has achieved its authorised strength, but apparently still needs to grow – why do you need a bigger Navy, and how will you recruit and retain the essential manpower that delivers it?

Clearly, the maritime domain and the role the Navy plays in Australia's security and prosperity is growing. About 97% by volume and 95% by value of Australia's trade enters or leaves the country by sea. If you look at our future force, we've got bigger ships, we've got more of them coming and government expects us to be available. In the past, that has meant being ready when called upon, but for defined periods of time. The things we find ourselves doing today are less defined in terms of their specific duration. So, this gets to the heart of my Headmark 2022 of being able to conduct sustained operations: to do that, you need a bigger Navy than we've had in the past. One of the challenges we've had in the past 30 years is a degree of workforce hollowness, which means we've had a lot of empty billets in our ships and establishments. Our uniformed workforce of 15,218, which is the highest since 1993, reflects for the first time in a number of years that we're actually at our

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authorised strength. But in order to be strong and conduct sustained operations, all of the workforce analysis we've done recently makes it very clear that we need a bigger workforce. We'll grow by another 650 personnel by 2024, but the mechanism now exists to increase our numbers beyond that in the future.

In terms of the workforce, the two keys are clearly recruitment and retention, and I'm delighted to say that in both areas we've seen record achievements: we've just seen the largest graduation from our naval college in the Navy's history – 168 officers graduated a couple of weeks back. We've maintained record intakes into our recruit school over the past 12 months, and we've got a current separation rate of 6.8%, which is the lowest in Navy's recorded history. So all of that has

come together to give us steady growth over the past two years.

Does this provide a reliable surge capacity?

Yes. For a long period of time we've had a focus on deploying one ship to the Middle East, and then simply responding to events in the region. It's quite different now. We're still maintaining our presence in the Middle East, and we're regularly deploying Task Groups – not just single ships – into our region. The government's southwest Pacific step-up of 2018 has seen us maintain two or three ships continuously there, and at the same time we've been regularly deploying ships into southeast and northeast Asia. In fact, a five-ship Task Group will leave next week for a six-month deployment.

Ultimately, we've got to build a force that has depth and flexibility to provide options to government. But it is clear now that we are able to multi-task the force and certainly the flexibility and capacity the LHDs provide is enormous, and they really are a game-changer when it comes to any sort of humanitarian aid and disaster relief response, nationally or regionally. We now find ourselves at a point where the government sees itself and the ADF, particularly the Navy, as being amongst the first responders to national emergencies and that hasn't always been the case.

What did you learn from the RAN's response to the 2019-20 bushfires?

In times of national crisis, and where a national response is required, the

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"If you look at our future force, we've got bigger ships, we've got more of them coming and government expects us to be available. In the past, that has meant being ready when called upon, but for defined periods of time. The things we find ourselves doing today are less defined in terms of their specific duration ... to do that, you need a bigger Navy than we've had in the past."

government turns to the ADF with the expectation that we can do something and make a difference. One of the big things for me, looking through the lens of OP Bushfire Assist, was that we did some things that we'd never done before – evacuating stranded Australians in bushfire-affected coastal regions, providing a safe haven for them, providing them with assurance and confidence that they would be looked after. We had three ships at sea doing exactly that: MV Sycamore, HMAS Choules and HMAS Adelaide. And

that's something we've never done before, and never been capable of doing before.

One of the big lessons was the resilience of our People and their adaptability, knowing that all this unfolded on New Year's Eve – we had to reconstitute our Ships' Companies, which were largely dispersed all over the country. The average age of our people is about 24, most of them would have been getting ready for a big New Year's Eve party, only to be recalled to their ships and sail. And they did that without question. That's pretty inspiring stuff.

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Back in 2011, when Navy was called upon to respond to Cyclone Yasi with amphibious lift ships, we could not do it. That was a defining moment in terms of our operational capability and that led to a new way of thinking around the seaworthiness of our Navy and of our fleet. I think for me one of the greatest lessons, which is largely untold, is the success of the things that we implemented post the Rizzo Review into our seaworthiness and our seaworthiness culture – this really culminated in January and February this year when we responded in OP Bushfire Assist.

How is Navy getting on with implementing Plan Pelorus?

I released Plan Pelorus 2022 shortly after taking command. It has five specific and measurable outcomes and they are very focused in terms of current operations, the future force, work force, engineering best practice, and ultimately our reputation and communication with government. This year is quite transformational in some respects, in that many of those outcomes will reach their maturity in terms of their campaign plans to deliver on what is ultimately the driving focus of Plan Pelorus, the 2022 Headmark of being able to conduct sustained combat operations as part of the Joint Force. I think that we are certainly on track, if not a little bit ahead of track. At the end of this year, I'll review Plan Pelorus so it continues to have a four-year rolling horizon. I'm not going to hand my successor a blank sheet of paper in 2022, I'm going to pass them a plan

that is alive, resourced, and that they can feel that they've been part of contributing to.

What's the status of Plan Mercator?

Plan Mercator is a long-term strategic planning document and it clearly draws very heavily on two things: the strategic environment that we find ourselves in, and the high-level Defence guidance pertaining to our long-term environment. In July, we saw the Government's release of the Defence Strategic Update (DSU) and also the Force Structure Plan (FSP). Those two documents will guide the priorities of Defence in terms of our future capability acquisition and development. Plan Mercator will be updated at the end of this year and it will take into account the outcomes and focus of those two documents and will provide updated guidance to Navy, in terms of how we deliver our future force and our future contribution to the Joint Force over the next 20 years.

What has driven the development of the Navy Industry Engagement Strategy?

For me, it was the realisation that Navy needs to formally articulate, to all our stakeholders, that without Defence Industry we don't have a Navy – we don't have the platforms and equipment that we need. Sometimes we take for granted how important people in the dockyards, the supply chains and in industry are to the delivery



and sustainment of our capability and ultimately how much they see themselves as being part of the Navy and the ADF. What I wanted to capture and really communicate, celebrate and propagate, was a deeper relationship with industry – something that really embraced the men and women of the Australian Defence Industry so they could feel that they are a deep part of what we are, what we do and where we’re going. And it really does reflect Outcome 2 of Plan Pelorus, which is all about planning and delivering future maritime systems. The reaction from industry has been very, very positive. There’s about \$100 billion being invested in future maritime systems and platforms over the next 20 years, so it just makes good sense to be having those conversations early.

What are the implications of the naval shipbuilding plan for the way the Navy conducts

its medium/longer-term capability development? How has Navy’s approach changed in recent years?

It is a different approach – we’ve taken a long, hard look at the lessons of the past. As we emerge into the fourth generation of naval shipbuilding in Australia, we understand the necessity to make this an ongoing and continuous industry, and that is reflected in the investment that government has made into shipbuilding facilities. This is a very deliberately planned and executed strategy: it provides sovereign capability, it provides a strong industrial base and ultimately it provides a very strong and sustainable Navy capability. For Australian industry, it means that we will have one of the world’s leading shipbuilding industries and we shouldn’t underestimate the capacity that we will have to build extremely capable ships in Australia in coming years. We’ve got Defence

and Navy People involved in every aspect of that from the ground up. We’ve not had that before.

Does industry get all this at a strategic level? And is it coming along on the journey?

I’d say the answer is a simple ‘yes’, and I give you an example. Last year when we held our Maritime Environment Working Group (MEWG – a Navy-industry information forum) at ADFA there were over 550 industry participants. The previous iteration we had just 200. The willingness of people to come and talk to me and to the other Defence leaders is, I think, unprecedented. The big thing I’ve been pushing in our Industry Engagement Strategy is that we’re moving the relationships from being transactional to transformational and involving industry, not just as part of a FIC, a Fundamental Input to Capability, but actually embracing them as a partner who needs to succeed – because if they don’t succeed, if they don’t have a viable business, if their employees can’t see the importance of what they’re doing and the importance of building quality defence products, we will all fail.

With all the changes happening in our strategic environment, how are our relationships with traditional allies such as the US, UK and France holding up? And what about our other strategic relationships – with India, for example, or Japan, South Korea and Singapore?

I’d say they’re very good – last week, I had a 40-minute telephone

conversation with Admiral Karambir Singh, the Indian Chief of Naval Staff. We've got each other on speed dial and we both spoke about our challenges and our opportunities to cooperate – and that occurred before the conversation between our two Prime Ministers. A couple of days later, I spoke to the new Chief of Naval Operations of South Korea. I'm in regular contact with the senior US leadership in PACFLT and INDOPACCOM as well as the Chiefs in Singapore, France, the UK and New Zealand.

There are a couple of aspects to all this: one is that the modern-day communications we have available to us allow people to communicate

very easily and transparently. We don't always have to wait and book in a call to schedule things – we can do it much more readily. In terms of the geopolitical environment, our friends and partners face similar challenges, similar threats, they seek to understand our thinking and what we can do together. When I talk about our Headmark as being able to deploy as part of a Joint Force and being able to put Task Groups to sea, I never envisaged that, as being an Australian Navy only activity. As we prepare to deploy to RIMPAC next week, en route we will operate with the New Zealanders, we will operate with the Japanese, we will operate

with the Koreans, we will operate with the Singaporeans and the Bruneians, and of course we will operate extensively with the US Navy during that Exercise. India is absolutely pivotal to what we're doing in the Indian Ocean and the Indo-Pacific; and again, we're seeing unprecedented growth in the activity, and the complexity of the activity, we undertake with the Indian Navy. I'm very grateful for the very strong relationship I have with Admiral Singh. He absolutely gets it when it comes to the importance of working together and sharing information and I look forward to further developing those relationships in the remainder of my tenure. ■

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A STRONG AND GROWING NAVY

Until recently, Rear Admiral Chris Smith was the Navy's DG Littoral, a role that he assumed in January 2019 after two years as Commander of Navy's Surface Force. He took the appointment of Deputy Chief of Navy in September 2020 after a career that has seen him command a patrol boat, frigate and LHD, with key staff appointments in the Directorate of Sailors' Career Management and as Director of Navy Warfare Professional Requirements. He spoke to **Gregor Ferguson** just before his appointment to the role of DCN.



Ten years ago, RADM Chris Smith was CO of HMAS *Darwin*, a frigate with a good, old-fashioned war-fighting role. Five years later he was CO of Navy's first LHD, HMAS *Canberra*, and five years after that he was appointed Navy's Director General Littoral – each job exposed him to a

different aspect of maritime warfare. So, what did the contrast teach him about himself and the job of the Navy and of the people who serve in it?

"It taught me lots! From the Navy's perspective, at sea we are first and foremost mariners – we just happen to be the spear-chucking mariners,"

he tells Navy *OUTLOOK*. "And the different elements of our Fleet provide different effects that can be employed independently or combined depending on the mission.

"What was apparent from my time in *Canberra* was the strategic impact of a big ship such as the LHD, it is a game-

changer," RADM Smith believes, citing the enduring impact of the inaugural deployment of HMAS *Canberra* to Fiji in 2016 after Cyclone Winston devastated the country. "Witnessing the enormous capacity the LHD has in conducting amphibious operations, in this case providing humanitarian assistance, and the strong relationships that were fostered with the Fijian military and government at the highest levels, as a direct result of us being there, highlighted to me that as a Navy we have come of age in terms of our reach and capability."

MASTERING AMPHIBIOSITY

Unlike a frigate whose main armament is missiles and torpedoes, the main armament of an LHD like HMAS *Canberra* is its embarked troops and supporting elements such as the hospital, which brings a different set of challenges for the Captain: "You're running a town – and you may command the platform, but there are independent commands and a higher HQ also residing on board," RADM Smith explains. "So you're a landlord, you're a CO, you're a mariner, you're the mayor of the town and quite often you're the arbitrator of issues and disagreements on board that you need to work through in terms of the various priorities people are dealing with."

Nevertheless, he adds, the RAN has absorbed and mastered this new capability relatively quickly, consistently pushing the boundaries of its use which is impressive and reflects well on the men and women of the ADF. The LHD is a clear symbol of Australia's growing ability to engage usefully across the region, as both a humanitarian and a war-fighting force.

"Amphibiosity is a key enabler in the region just by virtue of the maritime nature of its geography," RADM Smith says. Amphibious warfare is complex, he acknowledges, because the

environment is complex: ships operate close to land in concert with a landing force; every decision has a collateral impact.

"I think that operating more and more in the littoral is forcing us to think about how we fight: how we use technology, how we leverage agile processes to quickly adapt to changing threats. In doing that, in a complex littoral environment, we can very quickly take those ideas and concepts into our wider concepts of warfighting.

"We have also become a very evidence-based organisation. For decades, we've been dealing with issues with little if any improvement. Now, we're taking a systems approach to issues, identifying the root causes, doing the maths and based on evidence we're making decisions to solve problems."

"I do think littoral warfare is the area that provides us the best opportunity to be really innovative and agile in the way we do our war fighting – that will benefit us across the whole spectrum."

And the ADF is becoming very good at amphibiosity, he adds: "I remember going to RIMPAC for the first time and landing a Battle Group plus equipment over the beach in Hawaii, and having the Commander of the Land Force, a US Marine, call up and question us on our ability to do it in the timeframe we did. He invited himself over two days later when we recovered the landing force, just to see for himself how we did it and his comment to us was, we do it differently but, wow, what we do is effective! So, to have that sort of compliment that early in our amphibious growth path from a nation

that's been doing this seriously for a long time was really positive."

DG LITTORAL TO DEPUTY CHIEF OF NAVY

As DG Littoral (at the time of interview), he is not very interested in simply achieving a set benchmark for capability and performance, he tells *Navy OUTLOOK*. Navy is continually pushing the boundaries of what its amphibious capability allows it to do and he believes the Royal Australian Navy is now a world leader in a couple of areas: "And where we're not, we are very attentive students and we make the most of our friends and allies to learn where we can, and that has helped us along the way."

So, how has this career of contrasts prepared him for the job of Deputy Chief of Navy?

"Recent experience in the Fleet is a great help, both as a Force Commander and prior to that in command of an LHD, so I have a contemporary understanding of the fleet as it is and the challenges we're working through – and also the operational environment we're operating in," he tells *Navy OUTLOOK*.

He also credits Navy's recent leadership teams who have realised that the best equipment in the world is useless without smart people using it and thinking about how to use it. If everybody else can field high-tech equipment, the RAN's edge must come from the quality and training of its people, says RADM Smith. One of the big challenges he will face in his new job is building up the Navy's manpower and he praises the current leadership team for everything it has achieved so far. Work still needs to be done to bolster Navy's deep, specialist expertise, he acknowledges; this will remain a challenge in his new role. But the response to this challenge will evolve as the technology employed by Navy evolves – for example, robotics and autonomous systems.

Against that background, much has changed for the Navy in the way that it recruits, manages and nurtures its talent, says RADM Smith. The emphasis is less on establishing competition between peers vying for promotion and more on helping all individuals to achieve their full potential, "Because at the end of the day it's in Navy's best interests that everyone is successful as they move through the structure. I think that change in nuance, having responsibility for ensuring everyone has the opportunity to succeed, is a significant and positive cultural shift."

Navy wants its people to be the very best they can be, he says, especially in the fleet because they are the war fighters: "It's really, really important that we get the absolute best out of them, because we are putting them potentially in some very trying conditions. We need to ensure they are well prepared for them."

DIVERSITY

Diversity is gradually transforming the Navy despite being decried by some as 'virtue signalling'. Doing diversity right means giving Navy much greater access to talent and smarts in the community, RADM Smith says. "Sending women to sea is far and away the biggest impact I've seen in my 30 years-plus in the Navy, and the most positive thing we've ever done. We have outstanding women in all areas of our organisation who bring a diversity of ideas and views. But that is only one pillar of diversity."

Diversity embraces all aspects of our lives; gender, ethnicity, education and socio-economic differences are just some of the many discriminators of Navy's recruits and they all shape the way our people view the world, he says – done right, leveraging diversity becomes a game changer.

"You only have to sit back and look at some of the tragic failures of history, where a bunch of like-minded people



sat down and came up with a solution to a problem that was very much like the last one they faced, only to find that they were beaten by a diverse group of people who approached the problem from an entirely different perspective," RADM Smith says.

"Diversity drives innovation, it drives different thought processes and contributes directly to capability. One of the best recent examples of leveraging 'relevant diversity' in Navy is the establishment of the non-religious Maritime Spiritual Wellbeing Officer (MSWO) role. Identifying the legacy Chaplaincy Branch was no longer reflective of the diverse Navy workforce, Navy broadened the Chaplaincy workforce to include religious representatives from a number of different faith groups and established a secular workforce of wellbeing professionals to provide non-religious pastoral care and spiritual support to our people.

"Providing a diverse support system that better caters for the individual needs of our people will have a positive impact on our officers' and sailors' resilience and wellbeing and therefore contribute directly to improved capability outcomes.

"It is up to all of us to actively identify what are the 'relevant diversity' issues in our workplace and take actions to address them. Diversity of thought challenges you – and I think we should be challenged."

EMBRACING HIGH TECHNOLOGY

The people issue exists alongside Navy's embrace of high technology, says RADM Smith. Using autonomous mine countermeasures (MCM) as an example, the temptation exists to explore every new technology that could be relevant. But that could lead to a capability based on an unsustainable agglomeration of science experiments, he warns.

“What we’re looking at is fielding a range of mature systems where the innovation isn’t necessarily in the system itself, but how you use it.” RADM Smith cites the example of Australia’s offshore oil and gas industry and its proven ability to remotely control complex maintenance tasks on offshore pipelines from a comfortable office in Perth: “That’s really, really exciting. This kind of technology is already out there and being used.”

“The continuous managed introduction of leading-edge technology into a mature baseline capability will ensure we achieve a Resilient, Reliable and Repeatable operational outcome while remaining agile to the changing threat.”

RADM Smith encourages a more experimental and adventurous approach to capability development especially

with equipment at the leading edge of technology. “We need to be willing to try new things and accept that sometimes we will fail. We need to identify what is important for us to have as a sovereign capability and support Australian industry accordingly; where to invest our R&D dollars to achieve the best bang for buck; and where we should leverage industry, allies and partners.

“To achieve the agility we require in the future battle space, we need to be more actively engaged with innovative small and medium Australian industries, reducing the overhead for them to engage with Navy and build mutually beneficial partnerships.”

PREPARING FUTURE LEADERS

So, to exploit that background, how will Navy prepare its future leaders? “Leadership is key,” says RADM Smith.

“Our people are our best asset in taking these concepts and ideas forward, and if we don’t do it right they’re probably our biggest anchor in terms of stopping us moving forward. So, we need leaders who can make adapting and being agile the norm. We need agility and evolution of our training and processes and systems as part of the norm.”

RADM Smith wants an environment where people can put up a really good idea and others do not try to prove they are wrong, but look at it and improve on it. “That, to me, is a thinking Navy where we collaboratively move forward. It’s not a single individual’s responsibility to have a good idea and carry it forward through a series of decision points – it’s about everyone adding to it and cumulatively coming up with better and better ideas. Our leaders, at all levels, are crucial to enabling that level of collaborative



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behaviour and agility – that is what will make us a thinking Navy.”

Looking back, what are the changes in the service that his predecessors of a generation ago or more would be surprised to see?

“Although technology has advanced rapidly, I don’t think that has fundamentally changed the nature of service,” says RADM Smith. “The big change for me has been the focus on people factors; by nurturing and developing your people you get much better results than by putting them under enormous pressure the whole time and seeing which ones don’t break.

“We have also become a very evidence-based organisation. For decades, we’ve been dealing with issues with little if any improvement. Now, we’re taking a systems approach to issues, identifying the root causes,

doing the maths and based on evidence we’re making decisions to solve problems,” RADM Smith explains.

“Organisationally, this is a significant shift and our rapid growth in personnel numbers over the last few years and significantly improved platform availability across the Fleet are a direct result of this approach.

“One of the things that I love about Australia and the Australian Navy is that our structure is often very flat. When compared with other navies, which still often observe a very hierarchical structure, our people are different: even the most junior will ask questions, and that is a strength,” he says.

“It makes us a very effective and professional organisation. I learned very early on, and especially in command, if you tell one of the sailors to go and do something, they’ll ask you, ‘why?’ Because they’ve got lots on and need to

prioritise, but more importantly they are genuinely interested in understanding why they are doing things – no one wants to waste time and effort. So, culturally in the Royal Australian Navy we’ve always had to spend a little more time explaining to our sailors why we are doing things, and I don’t think that’s a weakness. It forces leaders to understand what everyone in the team is doing and why, and as a result we move forward efficiently, and get the intended outcome.”

RADM Smith is looking forward to his new job but has no doubts it will be challenging: “RADM Mark Hammond [the DCN at time of interview – see p.23] has done a fantastic job of building the Navy and getting the efficiencies that we have. Stepping into those very big shoes will be a challenge as he’s built a great legacy, but one that I really look forward to.” ■

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A NEW CHALLENGE LOOMS FOR REAR ADMIRAL MARK HAMMOND

RADM Mark Hammond will relinquish his position as Deputy Chief of Navy in September and will then succeed RADM Jonathan Mead as Commander Australian Fleet (COMAUSFLT) in November. He assumed the role of DCN in March 2018 and as Navy's Head of People, Training and Resources, has seen the service through some significant changes in how it designs and nurtures its workforce during a period of significant growth in operational capability. He spoke to *Navy OUTLOOK's* **Gregor Ferguson**.





Two years in the position of DCN have passed very quickly – what are the biggest changes RADM Mark Hammond has seen in the Navy in that time?

“Outside of improved operational availability and reliability, we’ve made significant progress transforming from a Navy that has been focused predominantly on platforms and systems into one that is more acutely focused on achieving results with and through our people,” he tells *Navy OUTLOOK*.

“Today’s Navy talks about a ‘Workforce in Being’ and a ‘Future Workforce’ focus, and we have invested accordingly. The establishment of Director General Future Navy Workforce in mid-2019 provides the structure to make this achievable, and the new Maritime Human Resource workgroup has animated that people-centric vision. That, to me, has been the biggest change in the people governance space.”

And what about his own contribution as the Navy’s Head of People?

“Being part of our team focused on contemporising our policy suite, problem solving through ‘systems-thinking’, and growing and retaining our future leaders has been a real highlight. Investment in and engagement with deck-plate leaders such as Leading Seamen and Lieutenant rank undoubtedly has been one of the most personally and professionally rewarding experiences,” he says.

The past two years have seen a fall in the Navy’s separation rate from 10.5% to 6.6% and Navy has grown from less than 13,700 to more than 15,400. The result, says RADM Hammond, is retained talent and experience, improved ability to sustainably crew our units, and an enhanced return on investment in training those officers and sailors.

“The average separation point [in a naval career] is about seven or

eight years; from an enterprise or ‘business’ perspective we’ve probably put a million dollars’ worth of training, housing and salary into somebody by that point, so having 500 people choose to stay in the Navy who would otherwise have left is half a billion dollars’ worth of investment that we’re continuing to derive capability from.

“From a humanistic leadership perspective though, recognising that we’re successfully motivating our people to continue to serve in today’s very demanding and challenging environment, that’s extremely rewarding.”

NAVY SET FOR FURTHER GROWTH

The workforce changes are timely: on 1 July Defence released its Force Structure Plan (FSP) which committed Navy to further growth – another 650 personnel will be added to the workforce by 2024 whilst the service continues to grow its Naval Construction Branch and reorganise its manpower management.

One of Navy’s ongoing priorities is now to transform the Training System to achieve a more efficient and effective output that is tailored to the needs of the Fleet in Being, Future Fleet and the Future Workforce, RADM Hammond tells *Navy OUTLOOK*.

“That’s something we have started work on and I’ve already spoken to CDRE Smith about (see p.17). He will inherit our early work, as well as the challenges to training arising from COVID-19, and we’ve hopefully set him up for success (and not just set him up!).”

He hands over to CDRE Smith in September, is taking a short break between postings and then takes over from RADM Jonathan Mead in November. While Navy People will not be his direct responsibility for too much longer, RADM Hammond’s new role as COMAUSTFLT will still expose

him to the problem of manning and sustaining – and operating – ships, submarines and aircraft.

THE OUTLOOK FOR SUBMARINES

Submarines will be a more prominent part of the Indo-Pacific (and RAN) strategic environment in the future, so what has changed about submarine warfare in that time, and what major changes is RADM Hammond, a 30-year submarine service veteran, anticipating in the future?

“The maritime domain is increasingly congested. There are more large ships, fishing vessels and submarines at sea in our region – and more strategic competition for resources and influence – than when I first deployed into the Indo-Pacific in the 1980s.

“Development of remote and unmanned vessels – employed by both ships and submarines – will further complicate the environment and compound the challenges. This has implications for submerged submarine safety that we have to constantly be prepared for. Overall, I expect to see more complexity and ambiguity in the environment, and the ability to quickly decipher and

adapt to the environment – at the speed of relevance – will become increasingly important to our ability to operate safely and to achieve the tactical advantages that underpin war-fighting success,” says RADM Hammond.

Adding to that complexity, on current trends, by 2050 around half of all of the world’s submarines will be concentrated in Indo-Pacific waters, adding to strategic uncertainty. Will that trend continue?

“I can’t see it not continuing given our current strategic context, unless the global economy suffers markedly due to COVID-19. If that occurs, then I guess some nations may be forced to slow or defer some acquisition or build programs,” replies RADM Hammond.

The Indo-Pacific’s geo-political as well as physical environment continues to be dynamic, congested and contested and this will shape how the RAN is employed.

“The environment is dynamic and certainly not what it was five years ago. It’s pretty hard to crystal-ball what it might look like in another five years’ time. Regional Naval activities are under the spotlight, so we have to be alert to the changes

and challenges to ensure we provide timely, professional advice to Defence and government about how best to employ our Naval capabilities in the contemporary environment.”

SURFACE FLEET OUTLOOK

What does that mean then for the Navy’s surface fleet?

“The implications are the same for our submariners, aviators and our surface crews. It means we have to be strategically aware and tactically proficient ‘naval master mariners’ – in all respects. Ultimately, our ships, submarines and aircraft are transportation and life-support systems designed to deploy and deliver a ‘naval power effect’ in the national interest, as part of the Joint Force. And whether that effect is presence, international engagement, combat power or reconnaissance, our potential to achieve that effect is always shaped to some extent by the operating environment,” he tells *Navy OUTLOOK*.

He adds, “Modern surveillance technology has led to the above-water environment being more transparent. Couple this with the increased naval force and fishing vessel congestion in the region, we must assume our deployed ships will likely be detected, tracked, sometimes shadowed and potentially ‘held at risk’ by other forces.

“So, we’ve got to take an aggregated view of what the demand signal for Naval power looks like and then apply prioritisation and risk management frameworks to understand where and how we should be applying resources to achieve best effect in the prevailing strategic and tactical environments, while maintaining the security and safety of our people and platforms.”

This has changed the way Australia applies sea power, believes RADM Hammond. “Today the Navy doesn’t



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Surface Force comprises all of the RAN's Major Fleet Units, Amphibious Warships and Auxiliaries, 4,500 highly trained people, and a significant sustainment budget to keep them ready for operations.

The demanding Fleet Activity Schedule requires that Surface Force navigates this complex business to produce seaworthy platforms for the operational commander. Decisions on the seaworthiness of Surface Force units require timely and trusted information across all the Fundamental Inputs to Capability. This information must be delivered through the context of seaworthiness policy to ensure the first line of defence is robust, auditable and able to be risk managed.

Surface Force has been working with 12thLevel to better understand how seaworthiness can be managed and assured, within the constraints of the Defence information and technology environment. Industry-proven methodologies have helped with the co-design of the problem statements, stakeholders' information requirements, and an iterative design process defines the needs of those carrying the responsibility of seaworthiness risk on the front line. Using accredited

software tools, 12thLevel has produced the Seaworthiness Management and Assurance Reporting Tool (SMART) to manage issues and provide data analytics capability to Surface Force decision making.

The development of disciplined workflows and data processes in SMART to manage Sea Release Boards and assurance functions has brought clarity of expectations to both ship and capability managers at the waterfront. Commander Surface Force is able to progress logically through Sea Release Assurance Framework information at formal boards and assess the risk to the capability of platforms before being released for operations. The captured data provides the Objective Quality Evidence to assure the ensuing certification.

SMART offers an EIM exemplar of delivering curated information to the warfighter. The tool provides the evidence to apply and capture professional military judgement where complex risk aggregation exists across the people and systems that are often placed in harm's way. This in turn allows Surface Force personnel to spend less time finding and more time analysing data to meet the outcomes of Plan Pelorus and to fight and win at sea.



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choose or conduct independent deployments or port visits. We haven't really for about five years. Navy prepares maritime power for employment by a Joint Force Commander where, and when directed by Senior Defence and Government leadership."

Navy is still deploying multi-ship task groups regularly into the region whilst maintaining its commitments in the Middle East – how can it sustain this level of activity while simultaneously growing its manpower pool and introducing new and upgraded ships and submarines?

"The short answer is, by design," says RADM Hammond. "You can be anywhere, but you can't be everywhere. In order to sustainably deliver an effect, whether it's a human resource effect or an operational presence effect, you've got to understand the building blocks that enable it to be successfully deployed, optimise them where you can, and then prioritise your resources and operations. We've been improving at this over the past two years."

AMPHIBIOUS CAPABILITIES

The current COMAUSFLT, RADM Jonathan Mead, was probably the first to enjoy Navy's substantially upgraded

amphibious (through the LHDs and their embarked troops) and warfighting (through the DDGs) capabilities. How are these bedding down and what are they teaching Navy, and Australia's neighbours and allies?

"The LHDs are now a mature capability, providing us with an unprecedented level of sealift capability, and a presence effect that can't be replicated by anything else in our fleet," says RADM Hammond. Their capability and flexibility make the LHDs a valuable regional engagement tool. They can embark troop elements from multiple countries and exercise a broad range of military effects from disaster relief to amphibious operations. "They are impressive ships, but equally importantly the LHDs have been pivotal in bringing our Navy, Army and Air Force together 'at sea' through a series of exercises, international engagement activities and regional transit and presence movements. In this sense they have helped harmonise some elements of our contemporary Joint Force, while shaping a Joint and 'internationalist' mind-set in many of our current and future leaders."

The DDG is still emerging as a capability, he says. "We are not at full operational capability (FOC) yet, but

it is great to have all three in the fleet and to be pushing them through their paces. As an enterprise we are at an early level of competency in terms of understanding and employing their full capabilities.

"A significant difference between the DDG and our other vessels is the capability and complexity of the Aegis combat system. It is an extraordinarily capable system, but there is an overhead in operating and supporting it, and a lot of that overhead falls on the shoulders of our workforce and some very junior operators. We need to make sure we get the settings right so we can sustain and optimise that capability for full effect and optimise our ability to animate the Hunter Class frigates."

Final thoughts on taking over as the future Commander Australian Fleet (COMAUSFLT)?

"It is a real pleasure to be serving in today's ADF. It's not lost on me that the Fleet is operating in a complex environment that is demanding on our people. My job as the Commander of the Australian Fleet is incredibly meaningful, and my focus working for them will be to make sure that I do everything humanly possible to set the conditions for their success. I'm really looking forward to that challenge, and frankly, I am honoured to be entrusted with such an important role!" ■

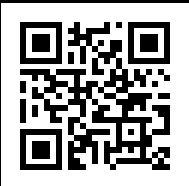
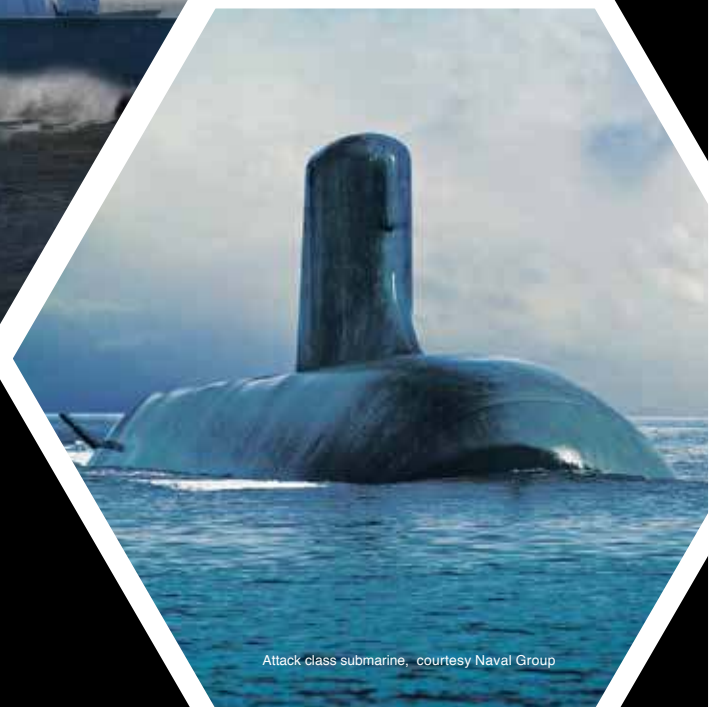
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Attack class submarine, courtesy Naval Group

DEFENCE INDUSTRY INNOVATION DRIVES COVID-19 RECOVERY

By Richard Price, Chief Executive,
Defence SA

While many industries have been struggling with the impact of COVID-19, Australia's defence industry has been fortunate and by working closely with Defence was able to minimise supply chain disruption to defence capability.

In fact, for at least one global defence company, their Australian operation was the only one working anywhere in the world over several weeks.

The sovereign capability within the Australian defence industry has been strongly supported by the Australian Government, which continues to keep the work and funding flowing through the primes down into the Australian supply chain.

As we begin a post COVID-19 economic recovery, our nation's reliance on international supply chains will come under question, and to address vulnerabilities, adaptable sovereign capability will become ever more critical.

Defence was able to swiftly respond to the impacts of the COVID-19 crisis thanks to its inherent ability to cope with the unexpected. Local industry was also able to pivot quickly and assist by manufacturing personal protective equipment and critical medical equipment.

Our defence industry, particularly in South Australia, is renowned for being at the forefront of innovation and technological development. The defence supply chain continues to increase its onshore capability and its capacity with industry is developing new and improved manufacturing, testing and construction facilities.



The new Line Zero Facility at Tonsley Innovation District is a shining example of how South Australian industry, academia and government are committed to collaboratively increasing our national defence supply chain capabilities.

This unique facility, an initiative of BAE Systems Australia's subsidiary, ASC Shipbuilding and Flinders University, provides the supply chain with a production-based sandpit for developing new and emerging shipbuilding technology in collaboration with primes and researchers.

The full-scale industrial test environment allows local companies to test cyber physical tools and techniques, which is key to transitioning new production concepts from the lab into the commercial shipyard environment.

The line provides a secure environment to trial, refine, validate and train the workforce on new advanced concepts and core elements of the digital shipyard before they deploy into the Osborne Naval Shipyard.

It allows defence primes, researchers, SME suppliers and technology partners to collaborate and accelerate the introduction of new capabilities across a range of Industry 4.0 concepts, including 3D printing, robotics, scanning, wearable technology, virtual reality augmentation, machine learning and cyber secure data systems.

The facility includes a shared collaboration space to attract investment from industries more broadly and internationally to access equipment and researchers to support acceleration of new cyber-physical advancements into manufacturing facilities.

Despite the challenges facing many businesses, the defence industries in South Australia and across the nation adapt and continue to grow in these uncertain times. The industry is driven by innovation, and initiatives such as Line Zero will ensure the continued success and sustainability of the sector.

Visit www.defencesa.com to find out more about South Australia's defence industry.



READY AND RESILIENT

Fleet Commander Rear Admiral Jonathan Mead describes himself as “fanatical” when it comes to ensuring the fleet is seaworthy and ready for action. He tells **Lachlan Colquhoun** how Navy has improved in this area, and about the exceptional circumstances for personnel living and working through the COVID-19 pandemic.

That has never happened before,” says RADM Mead.

The pandemic restrictions have meant significant changes to fleet preparedness as Navy balances the risk to its personnel with operational needs.

HMAS *Sirius* is resupplying all of the ships with both fuel and food, with extra fridges and freezers installed in preparation.

Bandwidth capabilities have been increased on the ships, so personnel can communicate with their families, while the onboard reverse osmosis plants are working overtime to make sure there is an adequate supply of fresh water for drinking and washing. Fresh food has only been taken

Australia regularly participates in the Rim of the Pacific (RIMPAC) exercises with the United States and other nations, but this year’s RIMPAC in August was like no other.

Because of the restrictions brought on by the COVID-19 pandemic, Australia’s four participating ships and

the nearly 1,500 Navy personnel have been living and working in isolation and quarantine, creating what Rear Admiral Jonathan Meads calls “our own little maritime eco-system”.

“All up, our men and women can expect to do around 120 days at sea without any type of liberty onshore.

onboard twice, in Guam and Hawaii.

Additional spare parts have also been taken onboard with Navy personnel performing repair tasks often undertaken by commercial contractors.

"The crews are getting very good at board games, physical training sessions and running beard growing competitions," RADM Mead jokes.

"But seriously, this has been an unbelievable learning experience for us. I think that of all the nations involved, our fleet has travelled the furthest distance and will spend the longest time at sea.

"We have tried to make life as normal for the fleet as we can, but we are asking a lot of our people and have had to introduce several new concepts to be able to operate at sea like this."

From the RIMPAC 2020 experience, RADM Mead says, will come new insights which will help improve Navy's resilience and preparedness for the future.

In addition to all the ships at sea – not just in the RIMPAC operation but on other duties – another 800 naval personnel are deployed with Operation COVID-19 Assist with other Defence personnel and police to manage COVID-19 restrictions in Australia, living and working under challenging conditions near state borders in addition to some other tasks.

"It's only in these difficult situations that you can truly stress test the organisation," he says.

"You will always find some weaknesses and vulnerabilities, and we are learning from these, and that will drive improvement.

"But I have to say our staff are always stoic, professional and cheerful, and I am in awe of them."

FLEET READINESS

RADM Mead describes himself as "fanatical" on the concept of fleet readiness, and says Navy has made major advances in this area since

Navy's preparedness was found wanting during Cyclone Yasi in 2011.

"A number of years ago the operators believed they were first among equals. We learned the hard way in 2011 that this was not the case," he says.

"You cannot sustain any capability, seaworthiness or battleworthy levels without engineering and logistics support, communications and industry.

"If you don't have them all lined up, you are going nowhere."

Since then, Navy has had a critical focus on seaworthiness, and its improvement was on display during Operation Bushfire Assist in January 2020.

"The year started on 31 December, when I called up the Commanding Officer of HMAS *Choules* and said 'get your ship's company together, because we need you to deal with the bushfires,'" says RADM Mead.

"I said we don't know the location, we are unsure of the duration, but you need to leave tomorrow, New Year's Day."

While *Choules* was already fuelled and provisioned as the Navy's designated Humanitarian Aid and Disaster ship, the ship's company were on short leave. They rushed back to Sydney to embark.

"In 15 hours they got 200 people together from around Australia, and the rest is history," says RADM Mead.

"That typifies the agility and the resilience of Navy people, their flexibility and what we can do."

HMAS *Adelaide* was also involved in Bushfire Assist, sailing four days after *Choules* with civilian contractors on board who were reinstalling the ship's gas turbine engines.

"We took the contractors to sea, and they rebuilt that gas turbine and Adelaide went down to Eden and provided fantastic support," says RADM Mead.

"That doesn't happen overnight and doesn't happen by itself. We have been on a long journey towards this level of seaworthiness, not only with our people but across the enterprise with CASG and other agencies."

Navy, says RADM Mead, works to rigorous seaworthiness and battleworthiness readiness targets, and rotates assets through a scheduling cycle of maintenance and workup to full availability and readiness.

HMAS *Canberra*, for example, is at sea in 2020 but will go into maintenance once the second LHD HMAS *Adelaide* completes hers.

The Navy's next generation of ships, says RADM Mead, will improve the fleet readiness even further, because even though they are larger ships, they will be easier to maintain.

"They will have more standardisation and more automation. We will have commonalities in the systems that will bring better efficiencies," he says.

"This year, we commissioned HMAS *Sydney* and next year we will commission the first Arafura Class patrol vessel and NUSHIP *Supply*, so these are very exciting times for the naval shipbuilding plan.

"Navy is now very well positioned to provide options to Government." ■



Rear Admiral Jonathan Mead



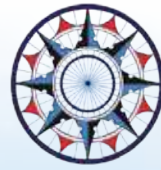
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NAVY BACK IN THE RACE

Lieutenant Commander Nathan Lockhart was central to Navy's return to the Sydney to Hobart in 2020 for the first time since 1998. He spoke to **Lachlan Colquhoun** about this year's results and plans for future races.

In an article in *The Australian* newspaper in 2018, the skipper of the Army Sailing Club's entry in the Sydney to Hobart race boasted that his crew always defeated the Navy, because the Navy did not enter a boat.

That article, and its not-so-subtle dig at Navy, was partly behind Navy returning to the iconic race in 2019, and not only defeating the Army boat *Gun Runner* but also taking out the coveted Oggin Cup, given to the fastest boat crewed by military personnel on corrected time.

But while happy with that result, Navy Sailing Team Captain, Lieutenant Commander Nathan Lockhart, says the achievement of the boat, *Navy One*, was not just about beating Army or even its finishing position in the race.

"We are never going to push for line honours or anything like that because it defeats the purpose of what we are trying to achieve and that is to represent the most people in the Navy who want to take part," says Lockhart.

"For us it's about building resilience and teamwork in our people, and one of our mandates in building a team is diversity in ranks, genders and experience."

Lockhart was central to Navy's return to the Sydney to Hobart in 2020 for the first time since 1998.

He says he went through some

mental health issues and got back into competitive sailing for his own personal reasons several years ago, and found returning to the sport after many years was positive for his state of mind and resilience.

When the idea came for Navy to enter a boat, Navy explored the idea of leasing a boat, but then the search focused on a boat Navy already owned and which was kept down at HMAS *Creswell*.

The Beneteau First 40 crossover racer and cruiser had already competed in the Sydney to Hobart under the name *Lunch Time Legend* in 2011, and came in 12th on handicap.

The cost of refurbishing the boat, says Lockhart, was the same as leasing a boat for one year but the advantage was that *Navy One* could then continue to race in subsequent events.

Support from Navy suppliers and contractors Serco, Thales, ASC, Verizon and Telstra also helped bring the boat up to a competitive standard, and the crew started training only four months before the race.

"It was a very short lead time, and we had to build teamwork very fast," says Lockhart.

"Some of the crew had never sailed, some had done Sydney to Hobart while others had been in Transatlantic sailing."

In putting together two crews, one to sail in the race and the second crew to sail back to Sydney, Lockhart says the mandate was to create teams with diversity.

"We didn't want it to be a boys' club at all, it wasn't necessarily about getting the best or most experienced sailors to win – it was all about diversity, teamwork and personal development," he says.

Ultimately, *Navy One* came inside the top 100 finishers after a dramatic last stage in the Derwent River when it passed eight other boats on the final night before arriving in Hobart at 5am.

"What was also fantastic was the reaction we got from other Navy people who had tracked our progress, and from all the people who came down to congratulate us, and that included Navy families and ex-Navy people as well as the public," says Lockhart.

While the COVID-19 pandemic is making preparation for 2020 difficult, the idea for future Sydney to Hobarts is to have a new person as skipper, and bring in fresh crew and give more Navy personnel a chance to experience the event.

Having been integral to the program, Lockhart plans to take more of a mentoring and planning role over the next few years as others take their turn on the water.

"The initial crew of 20 are so close, we are like a little family within Navy, and the idea is that other people can also have that positive experience," he says. ■

INTERVIEW WITH
**COMMODORE MICHAEL HARRIS,
COMMODORE FLOTILLAS (COMFLOT)**



2020 has been a year of disruptions for Navy exercises due to the implications of the COVID-19 pandemic. Even so, Commodore Michael Harris, the Commander of Flotillas and Fleet Exercises, tells how the Navy has continued to work on its preparedness throughout 2020.

The first main exercise for the year was the Fleet Concentration Period. Can you outline that exercise and the purpose it served for Navy?

A Fleet Certification Period 20 (FCP20) was conducted in waters of Bass Strait over four weeks in February and March and involved

more than 2,000 personnel.

The exercise was a high-end warfighting exercise, designed to certify that participating ships and their crews were ready to deploy.

Participating units were HMA Ships *Canberra, Hobart, Stuart, Arunta, Sirius, Diamantina, Huon, Collins* and *Farncomb*, and embarked Flights, with military aircraft from Australia, the United States and New Zealand also involved.

This exercise was led by Commodore Flotillas (COMFLOT), the RAN's Deployable Commander, as the CTG/OTC supported by his Maritime Component Command Element (MCCE) from the Fleet Battle Staff (FBS) with Commander Maritime Task Group (COMMARTG) supporting the task group warfare organisation; the exercise construct proving the RAN C2 model for maritime operations which supported a highly successful exercise.

Key competencies tested across a range of scenarios included high-end warfighting in the blue water ocean environment, amphibious operations, anti-submarine warfare and lessons learned from Operation Bushfire Assist.

The Australian Clearance Diving Team One also conducted very shallow mine countermeasures operations.

This was the first FCP that a Hobart Class destroyer had participated in, with Hobart notably acting as the Air & Missile Defence Commander (AMDC) and achieving a 12-hour period straight of ASW Towed Sonar (Tail) operations.

FCP20 demonstrated Navy's ability to project power at sea, to maintain freedom of manoeuvre and open sea lanes and protect Australia's borders and national interests abroad.

It also reaffirmed that Australia has adaptive and sustainable maritime task groups capable of accomplishing the full spectrum of maritime security operations.

Has the COVID-19 pandemic caused any modifications to your schedule of planned exercises?

The COVID-19 pandemic has dominated the focus of navies across the world. In Australia, our Fleet activity was reduced to Essential Activity, which impacted a number of exercises.

In 2020 the RAN was to have participated in the Ex Bersama Shield, Sea Explorer/Raider, Exercise Trident with Singapore and Exercise Keen Sword in Japan.

We have also cancelled our major international maritime exercise, Exercise Kakadu 2020. This was not an easy decision, as Kakadu has traditionally provided a high-end engagement opportunity for Australia's valued maritime partners. We will still conduct a series of bilateral at-sea activities with partners where we can, to keep our interoperability and friendships strong.

What can you tell me about the RPD20 passage exercises? This did go ahead from July 2020?

The ADF deployed into Southeast Asia and the Central and Western Pacific for a three-month deployment as part of routine operations prior to participating in Ex RIMPAC.

The Joint Task Group consists of HMA Ships *Arunta*, *Stuart*, *Hobart*, *Sirius* and *Canberra*, approximately 600 Army personnel, 4 x MH-60Rs, 1 x MRH-90, 4 x Army Tiger ARHs and RAAF P8A, as well as a vast RAAF contingent of E7 Wedgetail, F18 Super Hornet and KC30 tankers based in Guam.

The deployment demonstrates Australia's enduring commitment to the Indo-Pacific and our partners in Southeast Asia.

The deployment encompasses a wide range of activities, including bilateral and multilateral naval manoeuvres and military training serials with regional partners.

The Australian Joint Task Group conducted exercises with the Indonesian navy, the Republic of Singapore Air Force and with naval forces from the USN and JMSDF during a RAAF Supported Air Defence exercise out of Guam, with further regional activities planned before the deployment's completion.

All activities are conducted in accordance with protocols that mitigate COVID-19 related risks.

This includes the capacity to contribute to regional contingencies that may arise during the deployment such as humanitarian assistance missions.

The deployment is part of the Australian Defence Force's regular



military-to-military engagements throughout the Indo-Pacific, which are conducted each year.

Australia values the essential role that ASEAN plays in the security and stability of our region.

Has the RIMPAC exercise been modified and what form will it take?

The Australian Defence Force has deployed four ships (HMA Ships *Arunta*, *Stuart*, *Hobart* and *Sirius*) to take part in Exercise Rim of the Pacific in waters off the coast of Hawaii.

This year, Australia's attendance at RIMPAC is part of a wider Regional Presence Deployment through Southeast Asia to strengthen our longstanding security partnerships across the region.

Due to the ongoing COVID-19 pandemic, RIMPAC 2020 will be

an at-sea-only exercise in order to demonstrate likeminded navies coming together to operate ships, submarines and aircraft during crisis. The exercise events will take place during daylight only, and currently will not include any social events ashore. Continued planning will remain flexible as Navy leaders monitor and assess evolving circumstances.

Pacific Vanguard (PACVAN) is another Navy exercise which has a slightly different focus. Can you describe the exercise and its goals?

Exercise PACVAN involves Australia, Japan, the Republic of Korea and the United States, four likeminded liberal democracies and alliance partners of the United States working together to support our shared view of a free, open and prosperous Indo-Pacific.

INTERVIEW WITH **COMMODORE MICHAEL HARRIS, COMMODORE FLOTILLAS (COMFLOT)**

Cooperative maritime activities, like Exercise PACVAN, increase our ability to contribute to the peace and stability of the region.

Exercise Pacific Vanguard will enhance interoperability and strengthen practical cooperation between key regional defence partners.

Australia is committed to the stability and security of the Indo-Pacific region. This deployment is an opportunity to enhance our interoperability with key partners, and is not in response to the activities of any specific country.

Exercise Pacific Vanguard will enable the Royal Australian Navy to advance interoperability with Japan, the Republic of Korea and the United States by practising maritime manoeuvres as a multilateral task group.

Navy also conducts simulated exercises such as Viking Raider. Can you describe that exercise and its goals?

Exercise Viking Raider, held twice yearly, is a Synthetic Training Exercise (STX) with the United States Navy. Viking Raider is a Surface Action Group (SAG) level exercise designed to increase Unit, and SAG skills as well as develop interoperability with the USN.

Viking Raider sees USN assets in Japan connect to ADF assets in Fleet Base East, Fleet Base West, RAAF Williamstown and HMAS Watson to deliver high-quality training in the Synthetic environment.

The annual STX program includes Ocean Horizon, and Fleet Synthetic Training – Joint (FST-J), which are Task Force and Task Group level training events whereas the Viking Series which includes Viking Raider and Shield Maiden are designed to deliver SAG level training as indicated above, with Shield Maiden being an indigenous version of Viking Raider.

I'm interested in the role of simulation. Is it replacing the need to exercise or just making Navy more prepared and better trained for real exercises?

Synthetic training complements traditional exercises as it enhances training outcomes when conducted in conjunction with and as extension of traditional at-sea training.

Simulation removes the restrictions of the real world by allowing for increases in scale, density and complexity of the training environment. These extensions complement operations in a real world environment which cannot be simulated.

Simulation has, however, replaced some individual training activities at sea, in particular in the areas of Anti Warfare and Maritime Strike and Interdiction, in order to provide higher-quality, cost-effective training.

Synthetic exercises also allow Blue Force elements to execute a wider range of training scenarios with negligible real-world implications if they are unsuccessful, as opposed to committing resources at sea.

One of the biggest advantages of synthetic exercises is the ability to immediately play back the operation post-mission in data-driven slow time. We can break down any lessons into the causative factors. This allows significantly faster remediation to occur when the simulated adversary is getting ahead of us.

Are there any relevant innovations in the exercise program you'd like to highlight?

An area of progression in coming months is mine warfare, with the certification of the Mine Countermeasures Squadron's (MCDSQN) deployable staff and Task Group (MCMTG).

The certification event will test the MCDSQN and MCMTG under a multi-domain threat. Certification is important in that it provides an opportunity to mentor and mature key staff and processes important in waging war at sea.

It also acts as a yardstick to confirm where the organisation is at in being able to undertake such taskings. Mine warfare is also an element of warfare the RAN will have to negotiate and when we consider the threat that it poses to both civil and military operations in our area of strategic interest, it therefore must be exercised.

Additionally, like all other warfare skills, mine warfare has some very niche perishable skillsets that if not regularly tested become redundant.

Mine warfare is undertaking a number of innovations through

the introduction of systems and equipment that include improved C2 and situational awareness to the use of unmanned autonomous systems. These will increasingly be incorporated into Navy exercise events as these systems capabilities are matured and understood.

Some exercises are clearly about preparedness for war fighting, but others also have a diplomatic dimension, while others are about working with regional allies. It would appear there is a range of different exercises with different goals and benefits?

Yes, you are correct. Training is conducted for Raise, Train and Sustainment (of capability), Interoperability, or International Engagement (IE) purposes.

Firstly, we need to ensure that we are generating and certifying force elements across the full spectrum of maritime warfare to contribute to and enable the ADF to manoeuvre across the five domains of Land, Maritime, Air, Space and Information.

Our Fleet Force Generation Directorate is structured to focus on these domains and develop respective training outcomes. Sometimes that's through exercises with a single area we want to develop or it could be through large multi-focused events like the Fleet Certification Period.

Exercises such as Talisman Sabre, FST-J, Bersama Series, Pacific Vanguard and RIMPAC support development of our interoperability

with regional partners such as the United States, Japan, Korea, Singapore and Malaysia. These exercises develop common Tactics, Techniques, and Procedures, the ability to share information (and data), and importantly the understanding of the authorities required to conduct Combined operations.

Regardless of the size or complexity of exercises, overall diversity helps built a well-rounded force capable of interoperating with our partners and better placing us to respond to whatever the Fleet may face.

We seek whenever possible to contribute to or enhance regional security and maintenance of sea lines of communication. We seek to ensure ongoing regional access and freedom of navigation, including countering area-denial activities where appropriate.

There are also two separate biennial exercises with regional allies – Singapore and the Philippines. I'm interested in learning more about our collaboration with allies and how Navy works with partner navies.

Engaging with our regional neighbours is one of Navy's highest priorities.

The RAN exercises with many of our partners both here in events such as Kakadu and Dugong, and abroad in exercises like AUSTHAL, AUSINDEX and Paradise to name a very few of many.

These exercises support the development of capability and understanding of our regional partners, to help underpin the development of a Rules Based Global Order in the Maritime environment.

Singaroo in October is a bilateral biennial activity with Singapore hosted alternatively; this year sees its 25th anniversary and it is the major bilateral high-end maritime warfare exercise between AS and SG.

Ex Lumbas is a bilateral biennial activity conducted with Philippines; this year Lumbas will be conducted as a PASSEX during RPD 20.

Bilateral exercises provide opportunities for interoperability, war fighting capability and tactics development allowing shared interests of a secure maritime trading and a stable Indo-Pacific environment to collaboratively be developed.

Working with partner navies demonstrates that Australia supports a global rules based order and recognises that secure sea lines of communication are crucial to world economic prosperity.

By working with our partners, even during difficult times such as COVID, we demonstrate that Australia is a trusted friend in good times and bad and that the Royal Australian Navy is professional and gets the job done.

Significant maritime deployments such as the RPD demonstrate our leading edge capabilities and that we stand ready to lead or respond to crises. ■

OPERATION BUSHFIRE ASSIST ENDORSES SEAWORTHINESS JOURNEY

The rapid mobilisation of *Choules* and *Sycamore* and around 1,000 personnel was the culmination of several years of planning and change for Navy after the problems of Cyclone Yasi in 2011.

By **Lachlan Colquhoun.**



When HMAS *Choules* left Sydney on New Year's Day 2020, the ship's only instruction at that point was to pass through the Sydney heads and then turn right.

As the Navy's designated humanitarian and disaster relief (HADR) vessel,

Choules was fuelled and victualled and ready to go, and the ship's company were rapidly recalled from leave with other Australian Defence Force personnel.

Along with the versatile support and escort vessel MV *Sycamore*, *Choules* was directed to sail south and the operational

plan evolved as it was at sea.

"We had the ships brought to immediate notice not really knowing where the task would be, but we were pre-empting things and just trying to be ahead of the game," says Commodore Darren Grogan, who had only recently settled into his new position as Director General Maritime Operations (MAROPS) in December 2019.

CDRE Grogan had been co-ordinating Navy helicopters, largely from HMAS *Albatross* in Nowra, in the early period of the bushfires but as the situation became more serious it became clear that some form of shipborne assistance may be required.

"The logic we were using was that we would prefer to have them ready to sail and turn them off against not being ready," says CDRE Grogan. "And then once we got the request to go south we didn't have the details about Mallacoota but we knew it was down that way.

"We didn't have the task at that point, but we suspected that the worst case was that we were going to have to get some people out of there, and we were prepared for that, no matter where it was."

Choules was the designated HADR ship for Navy, but the smaller *Sycamore* with its shallower draught was more versatile and could be used, if necessary, as a 'ferry service' to link up with Navy RHIBS and other small ships to pick up people and take them to the larger ship.

In the conditions at Mallacoota, with its large sand bank, this versatility proved invaluable and the ships worked as 'sisters'.

The rapid mobilisation of *Choules* and *Sycamore* and around 1,000 personnel was the culmination of several years of planning and change for Navy after the

problems of Cyclone Yasi in 2011, when Navy had no amphibious capability available to respond.

CDRE Grogan says those events prompted a transformation in Navy's approach to seaworthiness, to ensure that the problems of Yasi never occurred again.

"Back in 2011 our people were ready but the ships weren't, and that was really disappointing for us," says CDRE Grogan. "But we proved how far we had come since 2011 during Operation Bushfire Assist."

While *Choules* and *Sycamore* were moving south, and it became clear that the task would be to evacuate people from the beach at Mallacoota, a decision was made to mobilise the LHD HMAS *Adelaide* despite the ship being in a maintenance period working on one of her gas turbine engines.

"We looked at her material state and did our comprehensive seaworthiness checks, and we agreed that she could safely proceed to sea" says CDRE Grogan.

"Under those conditions the civilian maintenance personnel sailed with her and completed final set to works on the engines as she was en route."

Unlike the ship's company for *Choules*, *Adelaide's* crew were called up from their end-of-year holidays on no notice, but such was the enthusiasm among Navy personnel that the crew were on board and the ship was sailing south less than a week behind *Choules*.

"Agility is not a word which is often used to describe Navy, but in this case I think the operation showed our agility and flexibility," says CDRE Grogan.

"*Choules* and *Sycamore* are very different ships, but were able to complement each other and work well together operationally.

"Then the LHDs are a very different type of ship and played a very different role, working with the other services and agencies to co-ordinate logistics and health services."



Today, the Navy has the "right classes of ships, and we are ready to respond in a timely fashion".

The dramatic success of Bushfire Assist has been well documented. Images of *Choules* and *Sycamore* evacuating people from the beach at Mallacoota went all around the world, and the exercise was hailed as a major success.

Choules completed two evacuation voyages from Mallacoota, taking on more than 1,000 people and around 150 pets, including a rabbit. The newly completed galleys in the ship were able to deliver 4,000 meals to hungry evacuees.

In the aftermath, CDRE Grogan says Navy has evaluated and assessed the operation, and is "satisfied we did

everything as well as we could".

"The fact that we haven't changed our approach to this upcoming fire period for the end of 2020 is an indication of our assessment," he says.

CDRE Grogan says the Navy's role in Bushfire Assist is now a source of pride for Navy personnel, giving them a "spring in their step".

"There was also a tremendous desire among Navy people to help their fellow countrymen," he says.

"During the operation I was continually inundated with offers of help from Navy people, either wanting to volunteer or to deploy their capability to assist.

"I had people knocking down my door, and now that it's over people are still talking about how good it felt to make a contribution and help."

As for HMAS *Choules*, she has made several return trips to Mallacoota and has "become a part of the community there".

"She's a very capable ship that has always worked hard and done amazing things; you could affectionately call her the 'hardworking ute' of the Navy," says Grogan.

While *Choules* might always be remembered for her role in the Mallacoota evacuation, she remains at the ready to help people again if required, wherever they are.



Commodore Darren Grogan

CHOULES AT THE READY

Long before HMAS *Choules* had a starring role in Operation Bushfire Assist in January 2020, she was known as RFA *Largs Bay*, and provided the same critical support to the UK government and their allies, alongside her three sister vessels, all maintained by A&P Group in the UK.

A&P Group has been supporting Bay Class landing vessels operated by the UK Ministry of Defence and the Royal Fleet Auxiliary since they entered service in 2005.

The company later assisted throughout the sale and transition of RFA *Largs Bay* when she became HMAS *Choules* and entered Australian Navy service in 2011. A&P Group played a key role in the early support for *Choules* and soon Atlantic & Peninsula Australia was established as an enduring presence within Australia with all the capabilities for long term In-Service Support.

The implicit knowledge, extensive experience and sovereign developed capabilities have enabled Atlantic & Peninsula Australia to keep *Choules* well prepared for action, as shown by the response to Cyclone Debbie in 2017.

"We had a tip-off on Friday afternoon that there was a chance *Choules* might have to sail. This was soon confirmed and Saturday lunchtime we were informed that *Choules* was required ASAP and was already scheduled for departure first thing Monday morning," says Scott Willey, Managing Director of Atlantic & Peninsula Australia.

"We were in the middle of an annual maintenance period, and despite the short notice we managed to stop all work and put her back together ready to sail safely and at full capability by 1800 hours on the Sunday. Our team, our suppliers and the ship's crew worked endlessly over the weekend to achieve

this incredible feat."

Atlantic & Peninsula Australia's interim maintenance contract was established soon after HMAS *Choules'* arrival in Australia. This contract was enhanced to a full In-Service Sustainment and Support Contract in 2015, and the scope of this contract was later increased to include the Capability Assurance Program (CAP) for HMAS *Choules* in 2019.

The CAP consists of 44 Capability Enhancement Areas and over 70 discrete engineering upgrades which will ensure that *Choules* is capable and supportable until her planned withdrawal date in 2031. The CAP also includes "Australianising" systems and support methodology as well as capability upgrades for the ship, including for self-defence.

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managing the design and installation of the upgrades and effectively integrating this with ongoing sustainment activities and the overall logistic support of the platform.

As part of the CAP, the company upgraded the ship's galley during the intermediate docking in mid-2019. This early intervention meant that *Choules* was better equipped and prepared to respond immediately to the bushfire emergency in early 2020.

"We received the call from our SPO about Bushfire Assist on New Year's Eve and were able to confirm that there was no outstanding work or defects and that she was 100% ready to go as the first responder. *Choules* sailed on New Year's Day and we were proud that the work we had completed throughout 2019 had prepared her for the role she and her crew fulfilled so well," says Willey.

The new galley came in particularly

useful during Operation Bushfire Assist, when it provided more than 4,000 meals to 1,000 civilian evacuees.

In total, *Choules* evacuated 1,117 people, 135 dogs, four cats and one rabbit from the bushfires in Mallacoota in Victoria, as well as making a number of urgent deliveries to other affected areas.

During the eight years of working on *Choules*, Atlantic & Peninsula Australia has worked with local Australian companies and built up a strong supply chain which keeps *Choules* prepared for action.

"Much of our success has been in building relationships and this is particularly so with our suppliers where we have developed a mature, flexible and resilient network," says Willey. "Our suppliers are happy to take a phone call and be on the ship that day, working whatever hours are needed to get the job done – I think the suppliers love the

ship as much as we do. There is a great culture surrounding *Choules* and this is seen with the ship's crew and Navy/CASG personnel alike."

Choules is scheduled for a major refit and dry-docking in 2021 when most of the CAP upgrades will be installed. Willey says the company would soon be issuing a call to industry to develop additional supply chain options and commence engagement for this work.

While Atlantic & Peninsula Australia's focus has been firmly on *Choules* since 2011, the company's Australian operation, and its supply chain, is well positioned to play an ongoing role in supporting other platforms in the Navy's new era of shipbuilding and sustainment.

Atlantic & Peninsula Australia is owned by Atlantic & Peninsula Marine Services which also owns A&P Group. ■

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The Northern Territory

Australia's Forward Operating Base

The Northern Territory has a long history as a strategic location for Australia's defence from which to mount, deploy and sustain military operations.

More broadly, Northern Australia has played an important role in the defence of Australia given its geographic location and support of the 'Forward Defence' policy – there is scope for great strategic collaboration across the north.

These roles take on a heightened importance given the 2020 Defence Strategic Update and the Australian Government's focus on the Indo-Pacific ranging from the north-eastern Indian Ocean, through maritime and mainland South East Asia to Papua New Guinea and the South West Pacific.

With the introduction of next generation defence technology and equipment, such as the F-35A Joint Strike Fighter and MQ-4C Triton, Northern Australia will remain the 'tip of the spear' to ensure a safe and secure Australia.

The Northern Territory will support these efforts by growing a professional workforce, nurturing a cutting-edge STEM ecosystem, delivering world-class maritime maintenance and sustainment through our Marine Industry Park and sovereign ship lift capability, developing a space industry across the north and supporting enhanced training range requirements. The Territory is positioned as a digital hub in the Indo-Pacific region, able to support defence and national security data requirements.

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NORTHERN AUSTRALIA: TIP OF THE SPEAR

The strategic importance of Australia's north to national and regional defence has long been recognised by government and policy makers.

Since the Second World War, northern Australia has been a critical contributor to Australia's security as well as a key stakeholder in the regional security architecture, including the Australia-US Alliance.

The north's proximity to the Asia-Pacific makes it a focal point not only for Australia's military security, but also in areas ranging from energy and natural resources to trade and border controls.

Building on its long history as a forward operating base for the Australian Defence Force (ADF) allies and partners, as well as border security agencies, the north is well positioned to maintain this role as we move into the next generation of warfare.

Military supremacy in the 2020-2050 era will be dictated by a force's ability to effectively employ fifth-generation capabilities, such as the Joint Strike Fighter and Triton, throughout the battlespace as we face an ever more complex and challenging strategic environment.

The global geopolitical environment is becoming more complex, and so too is warfare. The introduction of fifth-generation capabilities is likely to see potential combat spread across all the domains of land, sea, air, space and cyber.

The ADF is making significant investments into future warfighting capabilities, including 72 F-35A Lightning II aircraft, MQ-4C Triton high-altitude, long-endurance unmanned aerial system for the Royal Australian Air Force, manned P-8A Poseidon maritime patrol

and anti-submarine aircraft.

We are also likely to see an increased move to unmanned platforms, such as the Loyal Wingman drone and the ORCA Extra Large Unmanned Undersea Vehicle, which are able to engage in electronic warfare and intelligence, reconnaissance and surveillance missions.

In addition to new platforms, the ADF will also become more reliant on an integrated communications architecture and network. As we become increasingly dependent on networks and access to the electromagnetic spectrum, reliance on data, data assurance, processing and low-latency transmission, accuracy and deception will become critical to future operations.

The Northern Territory has unique characteristics that will help support the basing, forward operating, training, data support, and maintenance and sustainment for the ADF, US and other partner nations in this new environment. These include established electronic and traditional warfare training ranges, low to nil electromagnetic interference, established US training presence, proximity to Asia and the equator, abundant natural resources and large, sparsely populated land mass.

In addition, given developments in US strategic thinking, the importance of the north could well increase significantly in the coming years. Leaders in the US Congress, echoing regional policy specialists, are calling for the development of an Indo-Pacific Deterrence Initiative. This would see the addition of more US troops in the Asia-Pacific region, prepositioning of equipment, increased missile defence capabilities and new ISR assets. It would also see the requirement for more and

new training ranges.

It is feasible, therefore, that the Northern Territory could become the defence and national forward operating base for Australia because of the shortage of world-class training locations and support facilities, including the ability to test fifth-generation platforms and systems over specialised ranges far from population centres.

However, to support all of these activities, data connectivity and security are critical.

To address this capability gap in the north, Darwin will transform to a digital leader in the region through the development of a highly secure, high-speed terabit network. Using existing infrastructure with additional installations, the network will support the needs of government and defence.

A project is underway with planned fibre links that will connect Darwin and Port Hedland to Indonesia, East Timor and Singapore, providing contemporary high-speed, low-latency links through South East Asia. These fibre links are expected to be commissioned in 2020 and be operational by the end of 2022. There is also a planned fibre link to span the Indo-Pacific regions, providing the first subsea route to directly connect Darwin, Singapore, Indonesia and the United States.

All these exciting developments lead the way to the Northern Territory becoming the forward operating base for Australia's defence and the location of choice for our key allies and regional partners, such as the United States, Japan, South Korea and Singapore.

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FOSTERING COLLABORATION FOR THE COMMON CAUSE

Warrant Officer of the Navy Deb Butterworth says her goal over her three-year tenure is to “leave the place better than I found it”. She tells **Lachlan Colquhoun** how she thinks this can be done: through building up the capabilities of individuals and making them stronger contributors to Navy’s strategic goals.

// Wanting to be challenged and seeking adventure” were the reasons an 18-year-old WO-N Deb Butterworth gave for joining the Navy in 1989. Three decades later, her naval career has culminated in a significant honour: her appointment as the first female Warrant Officer of the Navy, making her Navy’s most senior enlisted advisor to the Chief of

Navy and a member of the Senior Leadership Group.

Her appointment as Navy's ninth Warrant Officer, following the tenure of now-Commander Gary Wight, came after a distinguished career in naval logistics, serving on HMA Ships *Jervis Bay*, *Success*, *Manoora*, *Newcastle* and also *Parramatta*.

As a Chief Petty Officer, she was awarded a Conspicuous Service Medal in 2006 in recognition of her service on HMAS *Newcastle* during Operation Catalyst, the reconstruction and rehabilitation of Iraq.

A bar was added to her CSM in 2014 in recognition of her service as Ship's Warrant Officer on HMAS *Success*, which during her time in the role deployed to Operation Southern Ocean, and later to the Middle East. She also served in the joint ADF humanitarian mission to Timor Leste.

"I have been really lucky and humbled to have had many different postings in Australia and to be deployed overseas numerous times in logistics roles, so yes, I think my original ambitions about being challenged and seeking adventure have been fulfilled," says WO-N Butterworth.

Asked for highlights, WO-N Butterworth nominates the Timor mission as part of a United Nations operation, and also her contribution to improving the culture on HMAS *Success*.

"I was very proud to have joined *Success* as the ship's Warrant Officer and at the time the ship had material and cultural concerns. We did a successful Middle East deployment and achieved a lot as part of a multinational taskforce, so I think that would be one highlight," she says.

"But every posting has been a challenge and I honestly think that my highlight would be the people I've met and worked alongside, the people who make up this organisation."



"I am focused on a collaborative Warrant Officer group which can promote understanding at every level of Navy on how people contribute, and how they can support commanders and managers."

WO-N Butterworth says that while she may not have been a leader as the 18-year-old who joined the Navy "to get out of Western Australia", leadership was something which evolved and developed along with her Navy experience.

"When you are a young sailor you are very much about getting a job done, and as you build through the leadership framework you start growing people and teams around you to support you and your role," she says.

"I think that leadership evolves as you find your own style and character, and it comes from your confidence in your ability to back yourself, and I think a lot of that comes from the people you work with as you develop your skills.

"I've learned so much from the

people I've worked with, from understanding what worked for them and I learned from leaders – both good and bad – and that is where I picked up my skills and attributes."



Warrant Officer of the Navy Butterworth

NAVY HAS CHANGED FOR THE BETTER

Navy today, she says, is a very different organisation than it was when she joined and the change has been positive.

“I’m really proud of the Navy I am in today,” says WO-N Butterworth. “It’s agile and innovative. It is a disciplined organisation and we value our individuals.

“We invest in our people and develop them, and are committed to their personal and professional development.”

Part of the change has been the evolving role of the Navy’s enlisted men and women, who comprise around 75% of the Navy headcount of around 15,000.

This evolution was recognised, and also given momentum, by the creation of the Warrant Officer of the Navy

position in 1993, which reflected the beginning of a change in thinking about the role of the enlisted sailors.

WO-N Butterworth’s focus is on fostering collaboration throughout Navy and driving individual and group contributions to the strategic Plan Pelorus to improve Navy’s agility, capability and resilience.

WO-N Butterworth has her own perspective on leading the enlisted personnel, and with a personal motto of “leaving the place better than I found it”, her focus is on an approach that is two-way – both as the voice of the sailors and as a conduit for Warrant Officers to the senior leadership team, and empowering them to understand how their work fits with strategic vision of the Navy.

“I am focused on a collaborative Warrant Officer group which can promote understanding at every

level of Navy on how people contribute, and how they can support commanders and managers,” she says.

“Warrant Officers contribute to a depth of experience. They are subject matter experts, the highest rank in their categories and have a balanced perspective they can contribute to the whole of Navy effort.

“I want to be a leader in an organisation where sailors understand when they go to work in the morning exactly how they are contributing to the Navy motto, ‘to fight and win at sea’.”

A key focus, she says, is on providing “clarity and context” where this may be lacking.

“I’m very much of the belief that if you understand why you are doing an activity, even if you are not happy with it, if you understand the intent behind



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it and have that full clarity then you will be able to perform and lead your team better.”

In achieving her goals, WO-N Butterworth recognises changes in Navy culture over her three decades, and how those changes are positive both for the careers of enlisted personnel, and also ultimately for the capability of Navy.

“Navy has reflected societal change, and the real shift has been valuing our people and the contributions they all make to a successful mission,” she says.

“The shift has been about getting the people piece right and the way we lead and develop our people, and if we do that right then the operational success will come.

“Our platforms are so complex the shift was essential to focus on investing in the people who



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operate the platforms and get the missions done.”

The ethos of the modern Navy, she says, is more collaborative than in the past, and the most junior workforce are encouraged to bring forward their own perspectives to the task in hand.

This, in turn, has helped foster agility and innovation and WO-N Butterworth cites recent activities, like Navy’s contribution to Operation Bushfire Assist, as an example still fresh in the public’s minds.

“If 2020, with bushfires and now COVID-19, has taught us anything it is about resilience and adaptability in changing environments,” says WO-N Butterworth.

She spoke of a sailor at HMAS *Albatross* who had completed his officer training on holidays waiting for pilot training, but asked to be recertified so he could “get back on the tools” and help during the bushfires.

“This example shows a real clarity of purpose and that is typical of our people, when they come together for a mission they demonstrate the amazing things we can do in a very short space of time.”

“Our people are really amazing and can adapt, and part of that is that they are happy to speak up and tell us when we are not getting it right, and we are happy to listen to that – just because you have rank, it doesn’t mean you have all the answers.”

WO-N Butterworth, who is based in Canberra, has also depended on this collaboration with her colleagues during the pandemic disruptions which have restricted normal movement around the country.

“I reach into my group on a daily basis because I need to understand what is going on throughout Navy and it’s hard to do that from Canberra,” she says. “So I rely on my cohort to give perspective and

feedback on what the core issues are at the waterfront.”

A MORE DIVERSE AND FLEXIBLE NAVY

Another cultural change in Navy has been towards inclusivity, and this also plays into the empowerment of personnel through recognition and respect.

“It does not matter what background someone has or what ethnic group or any aspect of diversity, whichever way you look at it they all bring their own skills and attributes,” says WO-N Butterworth.

“It’s about bringing everyone on the same journey and valuing everyone’s perspectives, because that will ultimately make us a far more high-performing team.

“If you don’t bring everyone on that inclusive journey they are not going to feel valued, and the organisation is going to be missing out on a different perspective and that will be to the detriment of the whole.”

The culture in Australia’s Navy, says WO-N Butterworth, has always tended towards a “more casual leadership style” than some other services, and this is often a positive on operations.

In East Timor, for example, she says it enabled easier and better connections and relationships with local civilians and local government authorities, all contributing to a better operational result.

“The Timor mission was a whole-of-government operation with the United Nations, and it went right through engaging with the local Timorese where we would go on a humanitarian rice run to someone in the islands,” she says. “So it was a lot of different levels of engagement but I think it is our casual and open nature which makes us successful in many of these situations.”

WO-N Butterworth again cites



“The shift has been about getting the people piece right and the way we lead and develop our people, and if we do that right then the operational success will come. Our platforms are so complex the shift was essential to focus on investing in the people who operate the platforms and get the missions done.”

Operation Bushfire Assist as an example of modern Navy capability at its best, with personnel through all ranks showing commitment, initiative and taking responsibility for their own roles but contributing to the team.

“If you had said to me a year ago that we would be sailing warships on New Year’s Day to evacuate Australian citizens from a bushfire-affected area I would have thought that was a unique concept,” she says. “But we got those ships to sea in much less than their readiness times, and we had so many people recalled in a short period of time to support the Australian population, and they all came together, they all knew what they were doing and why they were at sea.”

WO-N Butterworth gives the example of a sailor who was driving north to Hervey Bay in Queensland to spend Christmas and New Year with her family. After a three-day road trip the sailor was within 30 minutes

of Hervey Bay when she received a phone call about Bushfire Assist.

“She pulled over to the side of the road, rang her parents and told them she was going back to Sydney because she was going to sea,” says WO-N Butterworth.

Another positive to come out of Bushfire Assist was the seaworthiness of the ships, which were able to put to sea at a time of great need, reflecting the improved maintenance and sustainment since Cyclone Yasi in 2011, when Navy was not able to deploy an amphibious capability.

“It demonstrated the hard work we have done on our seaworthiness journey since 2011, and we are maintaining our platforms much better and the ships were available much faster,” says WO-N Butterworth.

“That also comes down to a unified effort with our industry partners, CASG and a whole-of-government effort to get those ships to sea.” ■

SOVEREIGN SHIPBUILDING CAPABILITY FOR AUSTRALIA

The **2020 Force Structure Plan** highlights continuous naval shipbuilding as a “truly national endeavour”. DMTC’s Maritime Program focuses on industrially-focused technology development and innovation, and is helping to build the capable Australian industrial base identified as a key enabler of Defence’s ambitious naval shipbuilding plans.

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RETENTION: THE PRODUCT OF RESPECT

A submariner by specialisation, Commodore Matt Buckley, RAN, assumed the position of Director General Navy People in December 2019 after two years as DG Maritime Operations and, before that, Commander of Australia’s Submarine Force. So he is intimately acquainted with the importance of the human dimension in everything the Navy does, an insight he has carried into his current job.

By **Gregor Ferguson.**

At the time this edition of *Navy OUTLOOK* was being prepared, the Royal Australian Navy recorded a total uniformed workforce of 15,218 personnel, its largest since 1993. CDRE Buckley does

not claim credit for what has been a years-long recruitment and retention effort, but he has responsibility for what happens next.

The Navy acknowledges it needs a robust workforce if it is to achieve

what the government asks of it. It needs to crew a bigger fleet of ships and submarines; it needs to oversee a continuous naval shipbuilding plan and sustain platforms already in service; and it needs to be able to maintain a high operational tempo – much higher than a decade ago – almost indefinitely. Because that is what the times demand, and that is what CDRE Buckley’s Navy People team must deliver.

2020 FORCE STRUCTURE PLAN

Defence’s new Force Structure Plan (FSP) was released on 1 July; this commits to an increase in Navy’s numbers of 650 personnel by 2024, with the potential for further growth foreshadowed thereafter. Against that background, CDRE Buckley was happy

to explain how the Navy got to where it is now, and how it will nurture and shape its workforce in the future.

"We've got the best retention figures in over two decades, which has allowed us to grow the Navy to the largest it's been in more than 25 years," he tells *Navy OUTLOOK*. Just two years ago that number was about 13,000 and refused obstinately to budge. Stronger recruiting has improved the annual intake and a reduced separation rate has been vital, he says. "It's now between 6% and 7%, and has been throughout 2020. That's a healthy figure."

However, even with a bigger workforce there are still some slightly 'hollow' areas where there simply are not enough qualified specialists for comfort, especially at the Leading Seaman, Lieutenant and Lieutenant Commander levels. Navy identified about 800 specialist positions and has reduced this hollow cadre to less than 400; that has helped recover some critical categories.

"They're people in critical trained roles at sea on ships and submarines and helicopters and Dive Teams, and so on," says CDRE Buckley. "We've still got work to do there. For us it's about being very surgical and targeting and generating specialists that are harder to get at. It's now about getting the right people in the right rank levels and the right work groups."

Personnel are also choosing to extend their service, says CAPT Virginia Hayward, Director Navy Workforce Strategy and Futures. "The median length of service in 2007 was six years; at the end of 2019 it was eight, and what we want in 2035 is to have that out to 12 years," she says. "That covers all of those critical ranks and categories and the recognition of how long it takes to grow leaders and experts."



DIRECTOR GENERAL NAVY PEOPLE

So how did his career as a submariner and then DG Maritime Operations prepare CDRE Buckley for the job of Director of Navy People?

"I've been very fortunate to work alongside some motivated and professional people who had a passion for their work," he tells *Navy OUTLOOK*.

"The Navy's also provided me with some tremendous leadership opportunities which have been complemented by professional education and development. As you move through your career it becomes apparent that the Navy prepares you really well for your next challenge. But in making the most of these opportunities, it's really critical to both believe in yourself and trust and empower the people who work for you – because as you climb the ladder of command it becomes clear the experts are actually the folk who work for you. So really, it's about bringing out the best in the people in your team. For this role, Director of Navy People, it's about stewarding this most

vital input to capability – our humans."

What did being a submariner teach him about people? "Submarines are ultimately about Trust, Teamwork and Tenacity," he explains. Aboard a submarine, every single human is critical to the success of the group as a whole; success or failure affects everyone the same way. "The other thing about submarines is the challenges you face require you to think laterally and without recourse to the outside world, and almost always



Commodore Matt Buckley



require great persistence in meeting them. I think these are really useful attributes to bring into something as complex as our people capability."

That is something he wants Navy to inculcate in its sailors, and especially a new generation of would-be submariners, given that the submarine workforce will need to grow quite significantly, he says.

"That is part of the spirit of submarines – and in fact the Navy more broadly. It's about a genuine belief and trust that we have in one another, it's all about everyone doing their job to the best of their ability, with professionalism every single step of the way."

"I think fundamentally, people join the Navy because they want to serve. They want to serve their country and they acknowledge – and we talk about that right up front – with service comes sacrifice. And we see that every day from our people, especially those who are at sea and separated from their families and friends, and they do it again and again in many cases."

The other side of the coin is that the Navy must recognise that service and sacrifice, says CDRE Buckley: "We need to help our people on their journey, we need to provide the appropriate support mechanisms for their families; we need to help them achieve their professional mastery; we need to provide them with assurance and stability in their career cycles."

THE MATTER OF DIVERSITY

The two extremes of current fashion are to either demand diversity for its own sake, at all costs, or deny its value completely and argue that recruiting women and ethnic minorities is simply a cynical move to boost numbers and pay lip-service to the concept of diversity. However, the Navy is an evidence-based organisation that has developed a very practical approach to diversity based on its own history, something with which CDRE Buckley has personal experience.

"When I joined submarines, we didn't have women. When I was about half-way through my submarine

career we admitted women, and it was profound to me just how much they enhanced the capability of the submarine, just by bringing a different way of thinking about problems, right across the board. And maybe it also brought a more compassionate edge to the organisation which was good for everybody," he adds.

"You need the full range of diversity because that's where you get those ideas, that one or two per cent that will make a difference.

"People from different cultural backgrounds really do bring an asymmetric advantage to any force because they bring diversity of thought. That allows you to be agile and adaptive, which is what you need to be as part of the fighting force. And at sea you've got a finite amount of human capital, so you want to make sure that you're not missing out on those important ideas. Those ideas need to germinate from within the ship or submarine or task group. So, we're not doing this for the sake of doing it: we're doing it because it

actually makes us a better and more effective organisation.”

Navy’s indigenous Australians bring an additional dimension, CDRE Buckley adds. “We’re on a journey now, understanding that Australia’s naval history goes back thousands of years, not just two hundred years; understanding the bonds that our indigenous people had with the sea and weaving those stories and threads into our organisation and culture.”

HOW TO ATTRACT AND RETAIN TALENT

Something that matters to the Navy, and to CDRE Buckley personally, is that the service mirrors the fabric of Australian society: “We are there to serve our government and our people, so when people look at the Navy they need to see themselves. It’s absolutely essential that we’re not an outlier.”

But the hard yards are never far ahead. In practical terms, Navy must continue to attract and retain high-quality people from across Australia. How?

A younger generation of Australians expects to be treated with dignity, fairness and equality, and valued for their professionalism, says CDRE Buckley. “I think that’s the key to it,” he tells *Navy OUTLOOK*. “We’ve just got to make sure we can convince a broad enough spectrum of the community that they’re the sorts of things they can expect when they join the Navy – both as an attractant to join, and also to stay.”

Luckily, human nature does not change: the spirit that drives youngsters to join the circus or run away to sea still exists, he says. “The spirit of adventure has not diminished over time, I don’t think, and each generation steps up. Some people always seek that road less travelled. We are always looking for people in the Navy more broadly who have that spirit of adventure. It’s still there and I

don’t think it will ever go away.

“We’re recruiting high-quality sailor and officer candidates. Some of our technical and officer categories are more challenging to fill, and that’s indicative of our broader social environment – if you’ve got people with high STEM skills it’s a tight market and many employers are after those,” he acknowledges. “We’re also focusing really heavily on getting that diverse mix of female and male candidates and extending the breadth of our cultural and linguistic backgrounds. And we’re doing pretty well in that space, with the ultimate aim of having a genuinely completely

“When I was about half-way through my submarine career we admitted women, and it was profound to me just how much they enhanced the capability of the submarine, just by bringing a different way of thinking about problems, right across the board.”

diverse workforce that is reflective of the broader society.”

Part of the secret is making sure that young women and people from diverse cultural backgrounds see the Navy and the ADF more broadly as the sort of environment where they can thrive and be successful. They need role models – successful women and successful people who have worked their way through the system, says CDRE Buckley. “We’ve found that our women’s leadership and mentoring program has been the single most important aspect of our retention because it’s helped many of our young women see where they can be 10, 20 years down the track with a career in the Navy, through mentors and guides and leaders and coaching.”

The separation rate for Navy’s female workforce is below 6%, which is very pleasing, CDRE Buckley says. “There’s been a huge amount of work go into that area with our women’s adviser and our women’s development and mentoring program, so that’s a real success. We have indigenous participation up to 3% now, which is really good, and we’re trending in the right direction there as well.”

What will success ultimately look like?

“We want to grow our people to be the best they can be, both professionally and personally, irrespective of how long they stay in the Navy,” says CDRE Buckley. “That, to me, is success. It’s about those factors that deliver a really professional and motivated workforce. Because if people are being well looked after, and they’re motivated and they’re getting the training, they’ll normally stay.”

The often-hostile maritime environment faced by sailors remains unchanging. How do you maintain time-honoured professional standards while introducing a culture that values diversity? “It’s got to be about respect and professionalism,” says CDRE Buckley firmly. “These things are going to be important to everybody in the Navy, it doesn’t matter what your demographic or background is.

“One of the things about Navy is that we serve at sea and we’re all equally and personally invested in the success of the mission. You’ve got to rely on one another to be professional. We have learned over time that to be compassionate and supportive of one another when we’re a long way from home for extended periods actually enhances our resilience. We are more resilient when we’re more diverse and more compassionate and understanding. We just have to remind our people that it’s all about having a positive and inclusive culture. And from that you will derive strength.” ■

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BUILDING THE NAVY'S FUTURE WORKFORCE

Captain Virginia Hayward, RAN, is the Navy's Director Navy Workforce Strategy and Futures, working directly for CDRE Anthony Klenthis, the Director General Future Navy Workforce. Her Directorate was formally activated on 1 January this year; she re-joined the Navy in September 2019 after 10 years out of the service working in emergency management, disaster resilience, security and human resources for the territory government. She is now one of the most senior of Navy's brand-new cadre of Maritime HR Officers (MHRO). By **Gregor Ferguson**.

Why does Navy need a Future Workforce branch when it already had a Director General for Navy People? Navy has a lot of growing to do over the next couple of decades: it will need a bigger workforce to both crew and oversee

the building of a new fleet of bigger ships and submarines, as well as to conduct sustained operations. And it needs to be more agile, diverse and asymmetrically superior than it has ever been. Part of CAPT Hayward's job is to undertake that planning for that new

workforce and the human resources capabilities and culture that make it sustainable without impacting the day-to-day operations of Navy people.

Navy's has some hard yards ahead to plan for the future workforce, CAPT Virginia Hayward tells *NAVY OUTLOOK*. Guided by Plan Pelorus's Outcome 4 – "Effectively Lead and Manage Our People and Culture", her team developed the Workforce Transformation Campaign Plan 2035 which was approved by the Chief of Navy (CN) in February this year. To ensure Navy is able to meet the deliverables of the Campaign Plan, a yearly Passage Plan outlines the immediate priorities.

On 1 July this year, Defence released the new Force Structure Plan (FSP) that committed to increasing Navy's workforce by 650 personnel by 2024, with potential to grow considerably thereafter.



The driver for this fundamental workforce change is the realisation that unless the Navy undertakes successful workforce transformation, it will not be able to crew all of its future ships and submarines.

The Transformation Campaign has five Lines of Operation:

- Line of Operation 1 – Achieve Support
- Line of Operation 2 – Set the Conditions for Success
- Line of Operation 3 – Win in the Market
- Line of Operation 4 – Counter Threats
- Line of Operation 5 – Transform the Workforce

According to CAPT Hayward, this Campaign will set up the Navy for success. “Line of Operation 1 is about committing to enduring change, to a well understood, transformative approach to ensuring the Navy is enhanced and ready for the future.”

‘Set the Conditions for Success’ is about building the organisational

foundations and making sure that the changes to come are all planned, integrated and synchronised.

Line of Operation 3 is “really about attracting and securing our talent and winning societal support”, she tells *Navy OUTLOOK*, acknowledging that this is a significant and enduring communications and growth challenge. “It’s an external line of operation and it’s basically ensuring that we’ve got support for Navy and a preference to join Navy. It’s about ensuring that mums and dads and aunts and uncles support Australia’s Navy. It’s about our reputation as a desirable employer and making sure people prefer to join and stay in the Navy.”

‘Counter Threats’ goes to the heart of Navy’s purpose says CAPT Hayward: “It’s about Navy’s ability to scale and shape and attract the right people for war fighting.” This is the goal of Navy’s workforce transformation and therefore includes protecting and sustaining that

change process into the future.

The fifth Line of Operation, ‘Transform the Workforce’, is about the cultural and employment changes that appeal to future generations. “That’s about the future Australian sailor and about committing to valuing and career-long investment in our people,” says CAPT Hayward.

Under Plan Pelorus, the Deputy Chief of Navy (as head of Navy People) has four workforce priorities: Stabilise, Recover, Grow and Transform. Navy is through the Stabilise phase, working through Recovery and has entered the Grow and Transform phases: “The Grow phase is about shaping the FSP Outcomes, increasing our Raise, Train, Sustain capacity and shifting the culture. The Transform piece – that’s our Campaign Plan where we want to ensure we have an engaged and professional workforce ready for the future fight. These are being planned in the face of some stiff headwinds:

strategic uncertainty and demographic trends. There is also the changing nature of work and career expectations – we are in the war for talent. And we’re planning for the young boy or girl in Year 1 – what is military service, or service in the Navy, for them in 15 years’ time? How do we ensure ongoing support for a profession that they want to join and stay with?

“Under the Campaign Plan that CN approved, we are well underway with the highest two workforce priorities which are, first, making a positive difference to the lives of our sailors and their families; and secondly, to contemporise and transform the training system to meet future requirements,” she says.

“We’ve also formed a Navy People Capability steering group which works as a subordinate group to the Navy Capability Committee.” This steering group is responsible for implementing the Campaign Plan and also ensuring that the interests of all parts of the Navy are considered as well. Its members are the Warrant Officer of the Navy, who represents the non-commissioned workforce; Director General Navy People, CDRE Buckley; CDRE Klenthis as the Chair; Navy’s Commodore Training, CDRE Charles Huxtable; and the Heads of Profession and Heads of Community across the Navy, encompassing all of Navy’s people from diverse careers ranging from engineering to warfighting to chaplaincy.

One of the biggest challenges is to keep a complex future workforce planning environment connected, says CAPT Hayward. “My role is not only to manage and govern the Passage Plan and Campaign Plan, but to integrate and coordinate people, plans and projects that are going on across Navy, to bring them under the umbrella and to connect them.”

MARITIME PERSONNEL COMMUNITY

Navy’s newest community, the Maritime



Captain Virginia Hayward

Personnel Community, includes the creation of the Maritime Human Resource Officer (MHRO) workgroup, and the transfer and alignment of the Maritime Logistics – Personnel sailor workgroup to the Maritime Personnel (MPO) sailor workgroup. This community was approved by the Defence Force Remuneration Tribunal and established in March this year. At the time of writing it employed 47 people who had transferred across from previously fragmented HR-related roles within the service. The MHROs will grow to 102 by the end of 2024, according to CAPT Hayward, and most of those new personnel will be at foundation level in fleet-facing positions.

Apart from a couple of senior officers, the MHROs will be employed across Navy at the Unit, Group, Force and HQ levels to provide enhanced HR and career support to Navy people, explains CAPT Hayward. They will have AHRI (Australian Human Resource Institute) certification qualifications. “They’ll be at sea and ashore, basically to ensure the workforce has a greater and relevant understanding of the maritime context and to design and implement contemporary HR policy and practices, and advice to commanders.”

To support Maritime Personnel Community operations, CDRE Klenthis’s Branch is also continuing to invest in the Athena workforce modelling and planning system, which will be available in October, CAPT Hayward confirms. Athena will allow a more sophisticated modelling approach to workforce structures and career development: a comprehensive, systematic analysis of Navy’s workforce needs and requirements.

The Director of Navy People, CDRE Buckley, agrees: “I think success for me is that we deliver a workforce generation system that actually gives predictable and sustainable deployment for our people: that’s what they’re asking for – particularly people in that first phase of their career, that first 10 years or so,” he tells *Navy OUTLOOK*. “The next part of success will be delivering next generation career management, providing people at all levels with a career management adviser they can talk to and a career development plan that addresses professional and personal development.”

NAVAL ENGINEERING CAREER CONTINUUM

One of the other catalysts for change, particularly in Navy’s Engineering Branch, has been the continuous naval shipbuilding program and the need to establish a Naval Construction Branch. CAPT Hayward acknowledges that Navy is now competing to some degree for the same talent as the naval industry – but the divide between the service and industry is not what it was, she says. “We’ve got to support them, because they’re supporting us to deliver the capability. It’s really got to be a collaborative approach. But if we know exactly what we need, and where we need to grow so that we’ve got suitably qualified and experienced personnel, then that puts us in a very strong position.”

Part of this process involves creating

career planning systems, according to CMDR Leigh Benning, Deputy Director Navy Workforce Management – Engineering. To identify both skills and shortfalls and help direct effort to ensure everybody's qualified for the job they do, Navy has introduced a Naval Engineering Career Continuum (NECC); a similar Maritime Logistic Career Continuum is now up and running and will be followed soon by one for Warfare Mastery.

The Career Continuum is not linked in any way to an individual's promotion prospects, says CMDR Benning. It is designed to help personnel and the service itself map their future careers, he tells *Navy OUTLOOK*. "So, if you want to grow a future HMS – Head of Maritime Systems at CASG – what are some of the pathways you could follow to get there? Do you want to be a Chief Engineer on a boat or a ship? It can give

you an idea of which positions you need to go through to gain the experience to fill that position."

NAVY CONSTRUCTION BRANCH

The Navy Construction Branch stood up in 2018 under CDRE Steve Tiffen, CSC, RAN; a part of Defence's Capability Acquisition and Sustainment Group (CASG), the new Branch comes under First Assistant Secretary Ships, Ms Sheryl Lutz. Personnel who worked on the Hobart Class DDGs (the so-called Air Warfare Destroyers) at ASC Shipbuilding's Osborne yard in Adelaide are transferring across and more will follow, says CMDR Benning.

The new Branch has spawned changes in the professional education of Navy engineers. Navy announced this year that students beginning their Mechanical Engineering Degree at ADFA would be able to specialise in

naval architecture during their third and fourth years, starting in 2022. They will still go to sea because all navy engineers need quality sea time to progress their careers, but exactly how much sea time a naval architect needs is still being determined. The new Branch will be based principally in Adelaide with a team at Henderson, WA, and should mature in time for the construction of the Hunter Class to begin; its pioneers have cut their teeth on the Hobart Class DDG and the new Arafura Class patrol vessels.

WORKFORCE GENERATION SYSTEM

To provide a more predictable career path and better work-life balance generally, Navy has also adopted a Readying, Ready and Re-set employment cycle. The aim is to create a new workforce generation system,

Delivering sovereign industrial capability on land, in the air, and at sea.



supported by a Crew Support and Ready Groups, to provide suitably qualified and experienced people in seagoing and deployable roles, as well as improved health and wellbeing for everybody. It is also supported by next Generation Career Management and Training Force innovations.

The potential benefits are significant, says CAPT Hayward: "The readying phase means that when individuals are posted to their ships, command has a more ready, trained and stable workforce. The benefits to individuals is more flexibility to weave in family and personal requirements to meet both career aspirations and seagoing requirements. Navy benefits by using the total workforce system to generate, support and sustain new capabilities. So, it's providing a degree of organisational discipline."

This model was approved by the

To provide a more predictable career path and better work-life balance generally, Navy has also adopted a Ready, Ready and Re-set employment cycle. The aim is to create a new workforce generation system, supported by a Crew Support and Ready Groups, to provide suitably qualified and experienced people in seagoing and deployable roles, as well as improved health and wellbeing for everybody.

Navy Capability Committee last year and will be implemented in the Patrol Boat, Submarine and Aviation Force Element Groups (FEG) by the end of this year; it will also be implemented for the surface combatants' Aegis combat system workforce, and then to other force elements in Navy.

On personal reflection of her return to Navy, CAPT Hayward says it is not many times in your career that you can join an organisation and do a job that has never been done before.

Navy needs to continue its reform, and to do that it needs to bring its people on the journey while attracting new generations. "We have a lot to offer because it's an amazing Australian organisation with a very highly energised, palpable leadership that I wanted to be part of again. Both my brothers joined the Navy; I left for a while and did other things, and came back because I knew it was my spiritual home. That's the reason I'm back." ■



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TRAINING TO FIGHT AND WIN AT SEA

The Navy motto “Fight to Win at Sea” has significant implications for training, according to Commodore Charles Huxtable. It means that the mission of the training force is to “Train to Fight to Win at Sea” and that ultimately means delivering the course content needed to enhance the skills of all mariners, with online delivery a key component.

By **Lachlan Colquhoun.**

When Commodore Charles Huxtable took up the role of Commodore Training for the Navy earlier in 2020, he came to the role with the mantra “deliver content to mariners”.

CDRE Huxtable was no stranger to training after previous roles as the Commanding Officer at HMAS Creswell with time also spent at HMAS Watson, but says he understood that the new job as head of Navy training was a much wider and all-encompassing remit.

As Commodore Training, CDRE Huxtable is responsible for delivering specialist individual training to all sailor categories and officer specialisations. He is also responsible for the delivery of collective training to Navy's ships.

Not only that, but the categories have become more specialised, training has broadened to embrace leadership and cultural training, and the way it is expected to be delivered has also evolved. The new generation of Navy personnel now often receive their training wherever they are, either on land or at sea, not just in the classroom.

The mantra "deliver content to mariners", says CDRE Huxtable, boils down his mission into an approach which is flexible enough to be relevant to every aspect of Navy training, and also defines the essence of what training is.

"We are growing Navy and that is a big challenge for the training force," he says. "So we need a lot more innovation in our approach to training to make sure we can expand the capabilities of that workforce on an ongoing basis, and that has been central to my role."

TRAIN TO FIGHT TO WIN AT SEA

The Navy motto "Fight to Win at Sea" has significant implications for training, says CDRE Huxtable. It means that the mission of the training force is to "Train to Fight to Win at Sea" and that ultimately means delivering the course content needed to enhance the skills of all mariners.

Online delivery is one key to this, and a major part of CDRE Huxtable's vision.

"My ambition for Navy is that everyone has an ADELE account, which is our learning management system," he says.

"They should have this account from the day they join and it should store all the training they ever do, so they can look back on their training and there is a record of all course material, a library of their learning so they can go back and



revisit it.

"We are moving to online learning, but we need to do it much more, and delivering blended learning, combining face to face with online is vital to improving the delivery of our training."

Part of that vision is to deliver the training to where the mariners are, so they do not necessarily have to physically leave their homes or jobs if the training can be appropriately accessed remotely.

"There is a time and a place for face-to-face training, and of course you can't build teams online, but we want to ensure that we add value by making the right courses available online and make that more efficient and accessible," says CDRE Huxtable.

"If people are at sea, it can make sense for them to access the training there, rather than make time to come down to *Creswell* or *Cerberus* and leave their ports or homes when they come back to land."

CDRE Huxtable has also identified a number of reform projects in a new Training Force Improvement Program, the first of which is around commercial innovation.

"I currently have about 70 contracts for outsourced delivery, and that is a large number, so I'm looking at ways we

might consolidate those contracts to provide a more scalable and sustainable model," he says.

"In this service delivery model, it allows me to move Navy people into developing course content and using innovation to deliver it.

"This will help ensure that the content is relevant and accurate because it has been developed by people who have been to sea recently and have that requisite knowledge."

A second project is around digital transformation, and this is focused on a better understanding of the training pipeline and making it more efficient.



Commodore Charles Huxtable

"I need to reduce the amount of time it takes for people to get from civilian life to delivering capability at sea," says CDRE Huxtable.

The third principle is workforce agility, which is about finding better ways to focus critical workforce skills towards high priority tasks.

"I've got some work groups that are short of people, so I need to be able to address that," says CDRE Huxtable. "And we also need to be able to update training faster, because the platforms are changing, and for me that means the ability to move workforce into priority areas and have greater control on where we move our resources."

This pillar ties into the fourth project, which is around organisational design and restructuring training force headquarters to provide a "stronger centre" for directing training force resources.

"At the end of the day, I don't train for the sake of training, I train to deliver people to the fleet which is my customer, and as their needs change I need to be able to change, match and respond," says CDRE Huxtable.

"So this means I need greater workforce ability and an ability to change in my organisation, and that means a stronger 'centre' which gives us more control about where we allocate resources, and that is something we will do as we do a redesign.

"We need to make sure we are adapting to the latest technology and using things like augmented reality, because no training organisation can exist without looking forward to the future, and what worked for me when I started my career is very different to what will work for the young men and women of today."

The final project, says CDRE Huxtable, is workforce development to ensure that Navy's training force keeps "evolving our people".

"We need to make sure they don't get stale, and that they are up to

date with technology so we can keep on advancing, and that means using technologies such as augmented reality," he says.

"Simulation, for example, is becoming very important and the bridge simulators at HMAS Watson are a great model for other areas of Navy.

"There you have a contracted solution which is delivering training very effectively to maritime warfare officers, and it is efficient in terms of the quality of training and their time, but also in terms of cost."

The bridge simulation, says CDRE Huxtable, is one example of how training has changed. In his day, islands in the simulator were "yellow triangles

"You don't need to have the title commanding officer to be a leader in the modern Navy, we are all leaders at different levels and our training reflects that."

on the horizon", while now they are in full detail and provide great realism.

This improves training quality, so that people can earn their certificates on the simulator and be ready to work on specific platforms when they go to sea."

CDRE Huxtable's remit includes not just individual training, but also collective training in sea training groups.

"This is where individual training meets ship training, and it all comes together to deliver our capability," he says.

"The Chief of Navy's strategy requires Navy to be able conduct sustained combat operations as part of a joint force, and we are critical in providing the people to conduct those operations.

"And for us it's about having a whole process and pipeline which delivers those people today, tomorrow and into the future."

"LEADERS IN THEIR OWN ROLES"

CDRE Huxtable has had a three-decade-long career in the Navy, and says that in addition to the technology and the ability to deliver online, the nature of the training has also changed in that time.

Today there is more emphasis, he says, on leadership and management at all levels of the organisation.

Training in these areas which was once delivered largely to officers is now available much more broadly, based on the principle that Navy personnel are leaders in their own roles.

"You don't need to have the title commanding officer to be a leader in the modern Navy, we are all leaders at different levels and our training reflects that," says CDRE Huxtable.

"Once people get an understanding of leadership roles, and are exposed to Navy's training, there is a thirst for increased leadership knowledge at all levels."

While the number of Navy categories has not markedly increased, a big change has been the increased technological complexity within the most categories which requires greater professionalism in the workforce, and for people to become deeper subject-matter experts.

This also has implications for training, which needs to be more ongoing.

"In the old days you were selected for promotion and would do a course, perform at that rank for four or five years and then get another promotion," says CDRE Huxtable.

"That was too long between training, and we need to look at training as an ongoing, never-ending, journey towards professional mastery.

"And this goes back to delivery, and why the online environment is so important as a way for our people to access training at shore and sea, and keep developing the skills we need to deliver Navy capability." ■

CERBERUS AT 100 LOOKS FORWARD TO THE FUTURE



Cerberus has long been the main centre for sailor training and celebrates its 100th birthday this year, along with a \$465 million upgrade. By **Lachlan Colquhoun**.

Captain Mike Oborn, the Commanding Officer at HMAS *Cerberus*, says that any sailor who went through the base for their training in the past will be amazed if they visit the base when the new renovations are complete.

"I think their jaws would drop because of the changes," he says.

"You walk into the front of the base and there is a whole new precinct there, and some of the new facilities we are putting in will be world firsts."

Cerberus, which takes its name from a warship purchased by the colony of Victoria in 1871 and later incorporated into the Royal Australian Navy, has long been the "Cradle of the Navy", where ever sailor starts their naval career, and celebrates its 100th birthday this year.

Up to 1,500 new recruits enter the Navy through HMAS *Cerberus* in 10 intakes each year. On completion of their recruit training at the RAN Recruit School, the majority of them remain at *Cerberus* to conduct their specialist category training. *Cerberus* is the home to the vast majority of the Navy's initial sailor specialisation training and a significant proportion of initial officer specialisation training.

Cerberus is proudly ADF, but unashamedly Navy. The ADF School of Catering, ADF Physical Training School and ADF Dental School are all housed at *Cerberus* and are just some of the tri-service training that is now conducted there.

"Most sailors under training don't look too fondly on *Cerberus* because they are indeed trainees, and the training can be tough," says Captain Oborn. "But when they come back to *Cerberus* as a staff member or for further training, it is amazing to see how they fall in love with the place. *Cerberus* is an incredible place and has a formative influence on the next generation of sailors."

The weather on the Mornington Peninsula might be severe and volatile, but that also teaches the positive value of resilience, Captain Oborn explains.

He says that while it retains much of the traditionally tough physical training, basic training for sailors also includes new elements which reflect the changing culture of the Navy in recent years.

"We need them to go from imposed discipline to self-discipline, and that is what our training is all about."

Modern training, he says, is also more focused on values than on rules.

"It's all very well to give sailors a big

book full of rules, he says, but we are better off to give them a moral compass and ethics."

The \$465 million upgrade will further modernise the nature of the training.

In addition to new sewerage, electrical and ICT infrastructure, the redevelopment includes a new Logistics Precinct, a new School of Survivability and Ship Safety, and a new Survival at Sea training facility which will be a world first.

"The survival at sea facility will be a 25 metre pool where we will teach people how to abandon ship in a controlled environment," says Captain Oborn.

"We will be able to darken the building, making it into night and add wind, rain, thunder and waves to simulate a storm.

"There will also be a crane holding a RHIB which will capsize on purpose and teach sailors how to escape, and that will be fantastic real-time training."

The infrastructure upgrades are phase one of the project, and were completed in 2020, while the other facilities are set to be completed by 2023. ■



Captain Michael Oborn



MAKING SHIPBUILDING A CAREER OF CHOICE

The Naval Shipbuilding College was established in 2018 to attract, develop, skill and retain an Australian workforce to successfully deliver and sustain the Australian Government's continuous National Naval Shipbuilding Enterprise.

Our vision at the Naval Shipbuilding College is to secure our nation through continuous naval shipbuilding and our mission is to develop the world's most advanced naval shipbuilding workforce.

Australia's Shipbuilding Enterprise encompasses over \$90 billion of investment in capability for the Royal Australian Navy. It comprises both the construction of advanced new naval vessels and also the sustainment, upgrade and modernisation of the existing RAN fleet. The four major new construction projects forming the core

of the Enterprise are:

- 12 Attack Class submarines to be constructed by Naval Group Australia at the Osborne shipyards in South Australia
- Nine Hunter Class frigates to be constructed by BAE Systems Australia at Osborne
- 12 Arafura Class Offshore Patrol Vessels to be constructed by Luerssen Australia and CIMMEC at Osborne and the Henderson Maritime Precinct in Western Australia
- Life of type extension of the existing six Collins Class submarines to be undertaken by ASC Pty Ltd

Also included in the Enterprise is a billion-dollar investment to create the world's most modern, innovative and technologically advanced shipyards.

Located at the Osborne Precinct in South Australia and the Henderson Maritime Precinct in Western Australia, the shipyards will embrace state-of-the-art manufacturing processes and possess the capacity to evolve with new technologies.

The successful delivery of the Enterprise will ensure the Royal Australian Navy will have a regionally superior capability to fight and win at sea, enhance our national security and deliver humanitarian assistance and disaster relief across the globe.

The projects are the largest capital investment undertaken in our country's maritime history and represent the greatest regeneration of Australia's naval capabilities since World War II.

They will embrace an unprecedented technical and industrial complexity. Critical to this unrivalled technology of design, manufacturing and sustainment processes will be Australian workers with highly specialised skill sets.

In collaboration with all spheres of government, industry, Defence and training and education providers, the College is leading the creation, delivery and sustainment of a cost-effective naval shipbuilding workforce for Australia now and into the future.

It is estimated around 15,000 workers will be required.

The workforce will be the driver of innovation, ingenuity, resourcefulness and the repository of the new learnings, skills and information. It will be one of the most skilled and technologically advanced naval shipbuilding workforces created in our country's history and result in careers with long term, stable employment and outstanding opportunities for advancement.

The College is committed to building a culturally diverse workforce



“The projects are the largest capital investment undertaken in our country's maritime history and represent the greatest regeneration of Australia's naval capabilities since World War II.”

which reflects Australian society and we are actively encouraging and supporting women, indigenous, culturally and linguistically diverse (CALD) peoples and Defence veterans, among others, to pursue careers in this exciting industry.

Employees on these programs will have the opportunity to gain training and qualifications across many high-end skills which will allow them to perform at the top of their chosen profession.

Developing this skill base will take time and require a new level of industry collaboration.

We will use the learnings and challenges from previous large-scale naval projects in Australia, including the Air Warfare Destroyer, Anzac frigates and Collins Class submarine

projects to advance our work in the areas of development and retention of skilled Australian workers.

To assist in offsetting the workforce risks, the College and six naval shipbuilding Prime contractors – ASC, BAE Systems Australia/ASC Shipbuilding, Lockheed Martin Australia, Luerssen Australia, Naval Group Australia and SAAB Australia – became signatories to the Naval Shipbuilding Industry Strategic Workforce Plan. This plan encompasses a four-step workforce planning model which includes Defining Requirements of Industry, Analysis of Training Needs and Supply, Design of the Workforce and Delivery.

It is a commitment to develop a cost-effective Australian naval shipbuilding workforce capable of delivering current and future maritime acquisition and sustainment programs.

Together, as a united industry working towards a common goal, we are documenting the skills and knowledge areas which currently exist in the Australian workforce and identifying any gaps in capacity or capability.

The College is also working closely with the Defence Science



“Retaining our skilled employees and positioning naval shipbuilding as an aspirational career of choice for Australians now and into the future will be crucial for Australia to maintain a continuous naval shipbuilding capability.”

and Technology Group and the Royal Australian Navy to identify the critical knowledge areas for naval shipbuilding, where it is essential that Australia possesses sovereign capability for protection of our nation and region.

As an Enterprise, we will need to know when to buy technology and when to develop it ourselves to create and sustain a national shipbuilding capability.

NATIONAL WORKFORCE REGISTER

Central to the sourcing of skilled Australian workers, the College created and operates the national Workforce Register.

The Register is the first port of call for people contemplating a career within Australia’s naval shipbuilding industry.

First-time entrants, people transitioning from adjacent industries or those wishing to upskill within

the industry can be connected with appropriate education and training providers across Australia that will enable them to become ‘job ready’.

All candidates receive weekly updates on available Enterprise-related jobs across Australia.

The register is approaching 3,000 candidates – from secondary school students to experienced workers – who have registered their interest in training and employment within the industry.

Each of these potential candidates is supported by an expert Candidate Engagement Consultant who works one-on-one with the person to identify their current skills, what they want to achieve in their employment future and supply them with training and education pathways to reach their goal.

The College operates as a ‘hub and spoke’ model with the hub represented by five business

units – Training and Development; Communications and Engagement, Industry Skilling and Assurance and Workforce Planning.

The College’s Training and Education Provider Network constitutes the ‘spokes’ in the model.

This network encompasses VET and higher education providers with representation in every state and territory in Australia and will assist with the upskilling of existing workers in the industry and ensuring future candidates can obtain the skills and qualifications underpinning the identified jobs across the Enterprise as required by industry.

Together we are determining the appropriate training and skilling needs to maintain a progressive, national workforce and to provide clear educational and upskilling pathways.

The College is working with our providers to identify and endorse current course offerings which meet the needs of the shipbuilding industry in quality and consistency.

By working together to contextualise courses to the needs of the industry, the College is ensuring there will be a pool of job-ready candidates with the required skills and training who are ready and able to contribute to the naval shipbuilding industry.

This criteria for endorsement may include curriculum, competence of trainers, engagement with the naval shipbuilding industry, access to specialist guest trainers/lecturers, work placements and tailoring of their courses for naval shipbuilding focus.

As the Enterprise is continuous, industry must look to the future while keeping one eye on the present.

EDUCATION AND CAREER OPPORTUNITIES

Retaining our skilled employees and positioning naval shipbuilding as an aspirational career of choice for Australians now and into the

future will be crucial for Australia to maintain a continuous naval shipbuilding capability.

We are developing strategies which will assist the industry to retain our skilled workers while also elevating the naval shipbuilding industry as a career of choice for future generations.

The College has partnered with online careers education platform Work-Ready to engage with educators and secondary school students across Australia about the future career opportunities available in our industry.

Through the Work-Ready program, educators and students will be able to access high-quality, industry-specific learning at no cost.

The College is also delivering a National Naval Shipbuilding Scholarship Pilot, supporting 20 students from the Queensland University of Technology (QUT) and 15 students from the Royal Melbourne Institute of Technology (RMIT).

The scholarships will help the tertiary students achieve their academic goals studying engineering and other naval shipbuilding-related programs with a focus on priority disciplines including computer software systems, mechatronics, mechanical, electrical and electronics, providing crucial workforce development at the initial phase of supply to the Enterprise.

Funds supplied in the third and fourth years of study can cover course tuition, student living and educational material costs. The scholarships also include a paid 12-week industry work placement.

The College has also pivoted quickly to lessen the impact of COVID-19 by bringing forward our plans for digital and remote learning education to support people impacted by the pandemic.

In collaboration with our education and training partners, the College has developed an online 'Shipbuilding Taster Course' aimed at anyone who is

considering a career within the naval Enterprise, or those who may have an interest in better understanding naval shipbuilding in Australia.

The course provides information on Australia's Naval Shipbuilding Plan, current naval shipbuilding projects, introduction to common shipbuilding terminology, production processes and roles within the Enterprise.

Through this introductory course, the College is reaching a diverse audience including secondary and tertiary students, workers from adjacent industries, ADF veterans, career guidance counsellors and the general public, to build awareness of the Enterprise and promote shipbuilding as a career of choice for Australians.

The College is also currently developing bridging courses which can help accelerate the transition of skilled workers from adjacent industries into naval shipbuilding to strengthen our skill base.

With momentum now on our side, Australia is positioning itself to successfully create and sustain a world-leading naval shipbuilding Enterprise and place ourselves within an elite group of nations which possess the capability to design, build and sustain their own naval vessels.

There has never been a more exciting time to join the naval shipbuilding industry. ■

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HOW THE NAVAL SHIPBUILDING COLLEGE WAS FORMED

In 2016, the Australian Government called for tenders to create and operate a Naval Shipbuilding College in Australia.

The College would take the lead, in collaboration with industry and the training and education sectors, to develop and sustain an Australian workforce with the skills required to successfully deliver the Australian Government's \$90 billion continuous National Naval Shipbuilding Enterprise.

The lead contract for the Naval Shipbuilding College was awarded and managed through the National Naval Shipbuilding Office, a part of the Department of Defence Capability and Sustainment Group.

The ultimately successful tenderer for the College was the Naval Shipbuilding Institute (NSI), a joint venture created between the largest naval shipbuilder in the United States – Huntington Ingalls Industries – and global engineering, procurement and construction company Kellogg Brown & Root (KBR).

The NSI established subcontracts and agreements with key stakeholders including Manpower Group, TAFESA and SMTAFE in WA to support the College's operations.

The Naval Shipbuilding College was officially opened at its headquarters at the Osborne Naval Shipyard in South Australia on 3 April 2018 by then Australian Defence Minister, Christopher Pyne.

The College has expanded its operations to include offices in Western Australia and has plans to open a further office in New South Wales.

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CHARTING THE OCEANS GOES HIGH-TECH

Commodore Fiona Freeman's 33-year career in the Navy culminated in her appointment as the first female commander Head of the Australian Hydrographic Office in 2017, known as the Hydrographer of Australia. She tells **Lachlan Colquhoun** about her career, and how data is playing an increasingly important role in hydrography, both for strategic use by Navy and the civilian community which the AHO also serves.

Commodore Fiona Freeman has always wanted to go to Antarctica and thought she had her chance about 20 years ago when, as a younger officer, she did her first posting to what was then called the Hydrographic Office RAN.

"I'd been posted to the Office and was hoping to go down to Antarctica in

the summer, but that was the year that the situation in Timor Leste broke and I got sent there instead," she says.

"Sadly that opportunity has never come up again, even though I've spent the last 12 months, whilst in this role, trying to find an excuse."

Her previous tenure in the Hydrographic Office, she says, gave her

invaluable experience and insights into the function of Australia's hydrographic responsibilities which she has been able to use in her current role.

Today, CDRE Freeman is Navy's senior officer at the re-named Australian Hydrographic Office, which since 2016 is now under the Australian Geospatial-Intelligence Organisation, part of the Defence Intelligence Group.

While the AHO conducts regular projects in Antarctica, CDRE Freeman's busy role sees her largely confined to the organisation's headquarters in Wollongong, where she heads a staff of around 150.

Of that group, roughly 120 are civilian public servants comprising cartographers, hydrographic surveyors, geospatial analysts and support staff.

Then there are around 30 naval personnel who deal with the defence



component of the AHO's mandate.

There are also AHO staff in Canberra, fully integrated into AGO and regularly liaising with all other aspects of the Defence leadership.

"The role of the office sits under the Commonwealth Navigation Act where we, on behalf of Defence, are the national representative producing maritime safety products," explains CDRE Freeman. "These are charts, tide tables, any critical product that the mariner uses to go to sea.

"We have historically, for 96 years, been part of the Navy but in 2016 that changed when we joined the Australian Geospatial-Intelligence Organisation in a separate group in Defence."

While the organisation is under Defence Intelligence, Defence's fleet of ships – which are based in Cairns in Far North Queensland – remain with and are operated by Navy.

CDRE Freeman, as head of the AHO, is responsible for generating tasking for these ships which provide data back to the office, but the ships themselves remain a capability in the Navy fleet.

They comprise two hydrographic

survey ships and four survey motor launches, and a number of deployable teams which can embark and operate from other Navy ships and platforms as required.

"So in addition to the products that we create for the civilian and commercial maritime industry, there is a second category of products we deliver, and these are for Defence and for Navy," says Freeman.

"The resources of the AHO are largely focused on meeting our requirements under the Navigation Act, but there is also a highly strategic element in what we do."

CDRE Freeman is proud of the "value add" the AHO makes to Defence and Navy's capabilities. This spans environmental information to data used in combat systems and new technology on ships which require a full suite of information to ensure they are able to perform at their best.

"That value add ensures that our warfighters have the best information at hand and that extra edge, and that is what we are trying to provide," she says.

"This is certainly not a new concept.

A major part of warfare has always been the search for the best and most efficient edge that can make the difference when it really counts.

"That is the strategic and competitive edge the Navy needs. In the Second World War you wouldn't be landing a ship on a beach without having done some environmental research and information collection, and it's no different today, but the way we are able to do it is more efficient."

The combination of these two remits, for civilian and military use, is part of what gives CDRE Freeman her job satisfaction.

"I love the fact that we are producing really tangible products which are used by everyone from the yachtie who might only sail out of the harbor on a weekend through to a big merchant ship bringing in thousands of cars, to a submarine deployed into an area for defence work," she says.

"I think that is the thing that keeps me motivated every day."

MODERN-DAY HYDROGRAPHY

Hydrography, says CDRE Freeman, is

a science but it is one that is always evolving due to the influence of technology.

While the first charts of Australia's oceans date from the late 18th century, the work of the Australian Hydrographic Office is very different to the pioneering work of forebears such as Matthew Flinders and Nicolas Baudin soon after European settlement.

As CDRE Freeman explains, today's hydrographers rely not only on surface ships but are increasingly taking their information from growing constellations of satellites orbiting the earth.

This enables them to not only deliver digital information to mariners, but to move towards the ability to update it in real time.

The AHO moved largely from paper-based to electronic charts several years ago, and this move has enabled more frequent updating of charts as new data is collected and analysed.

This is a major safety improvement for mariners who know they are working off the most recent information, rather than a paper chart printed on the basis of information collected some years ago.

Time is now a major factor to consider, as is the need to check the quality of data being collected against historical data.

"There is definitely that element of time, which demands that we ensure that the most accurate data is being promulgated," says Freeman.

"Then there is also our ability to put more detail into the electronic products, and that reflects the fact that now, within ports and along major shipping routes, there are larger ships able to do more over a longer period of time, and that has implications for us."

The underlying enabler in virtually everything the AHO does is data – and lots of it. Today, CDRE Freeman says the AHO is involved with a major data project with two components: one to support civilian charting products and the other for Navy and Defence.

"These are about what data is collected and how it is collected," she says.

"The first is a national project and we are doing that in collaboration with leading data management providers and the maritime industry."

The second component is around data collection for military purposes, and this is being considered through the lens of the larger Navy shipbuilding project.

"The volume of data we collect is extraordinary and one of our key challenges is managing the volume of this data and making sure that it is used to best effect," says CDRE Freeman.

"It is much more real-time than it ever was historically with paper charts, and is becoming increasingly so as geospatial and positioning technology develops further."

Information collected from space, says CDRE Freeman, provides valuable early information which can help in managing the survey fleet efficiently.

"Rather than just heading out and continuing to go up and down around an area, we can be better focused," says CDRE Freeman. "And in time we'll be doing more with robotic and autonomous remote systems, which is an exciting cutting-edge area that will become more important, and I have



Commodore Fiona Freeman

no doubt that we will be producing products predominantly based on remote sensing."

MODERN-DAY CHALLENGES

The good news, says CDRE Freeman, is that today's oceans are now a much safer place for mariners than in the past.

Mariners have more detail and increasingly updated information to act upon, but as the maritime industry grows and needs to put larger ships into "tighter areas" to meet new time frames, developments always present new challenges to hydrographers and





place new demands on their work.

"So while our work is always developing and improving, the maritime environment is becoming more sophisticated and we need to make sure we are ahead of these developments all the time," says CDRE Freeman.

Fortunately, the AHO is up to the challenge. Over its 100-year history it has acquired international respect for its capabilities and is a significant contributor to the efforts of the International Maritime Organization.

Australia, after all, is a major maritime nation surrounded by three of the world's largest oceans, and hydrography has played a significant role in the nation's development.

"Australia is very well regarded in what is effectively world hydrography's parent body, the International Hydrographic Organization, which is a body providing guidance and policy advice about all things hydrographic and navigation safety," says CDRE Freeman.

"In conjunction with the IHO we contribute a great deal to setting international standards, maintaining standards and improving standards in these international forums.

"There are 93 countries which are members of this organisation and the

headquarters are in Europe. Australia has always been very active and continues to be a major contributor in this space."

A THREE-DECADE NAVY CAREER

CDRE Freeman came to her role at the AHO after a three-decades-long career in the Navy. Originally from Brisbane, she commenced a teaching degree after completing her secondary education but never worked as a teacher.

"I was originally going to go to the Defence Academy, and at the time – as a 19-year-old – I thought I've just had 14 years of sitting in a classroom, do I really want another three years of that at university?" she says. "So I changed my mind and decided to look at other options, and I was offered the chance to join what was then called the Supplementary List. This was a short service commission and they said you can go straight to officer training at HMAS *Creswell* and find yourself at sea doing a job in nine months' time.

"I gave that a go, not really knowing what I was entering into, and here I am 33 years later and I've loved almost everything I've done."

In the 1980s, CDRE Freeman was one of the first female officers to go to sea, paving the way for many of today's

female officers.

Over her career she has had a particular link with hydrography, commanding two hydrographic vessels – a Paluma Class survey motor launch and a Leeuwin Class hydrographic ship – in addition to serving as the executive officer in a landing craft whilst on operations in East Timor.

CDRE Freeman was also on the HMAS *Jervis Bay* which was deployed to Somalia in the early 1990s in a humanitarian role during that nation's conflict, and has participated in border protection operations around the North-West Shelf area of Australia.

On land, she has spent time in Navy's career management agency, in the joint operations command headquarters, and as chief of staff to the Vice Chief of the Defence Force.

The AHO role, says CDRE Freeman, is an unusual role in that it is "very much a dual-hatted role" with most of the resources devoted to a national role, while there is still a significant military component and she still wears a Navy uniform.

"This has certainly been the pinnacle of my career in terms of promotion into Navy's senior leadership group," says CDRE Freeman.

It is a long way to come for someone who joined the Navy for excitement and travel after a childhood spent with a father who was a keen recreational fisherman.

"My father was a really keen fisherman and I was always out on the boat with him, so there was definitely that background," says CDRE Freeman.

"You could say that I grew up being no stranger to water."

CDRE Freeman is due to complete her post at the AHO at the end of 2020 and does not yet know what the next step will be in her distinguished career.

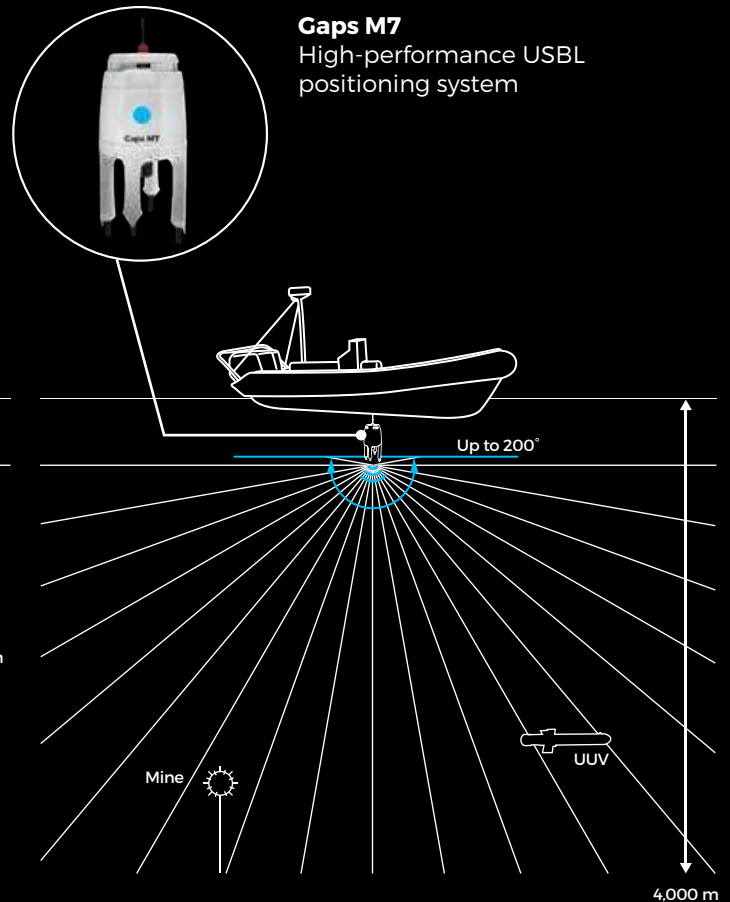
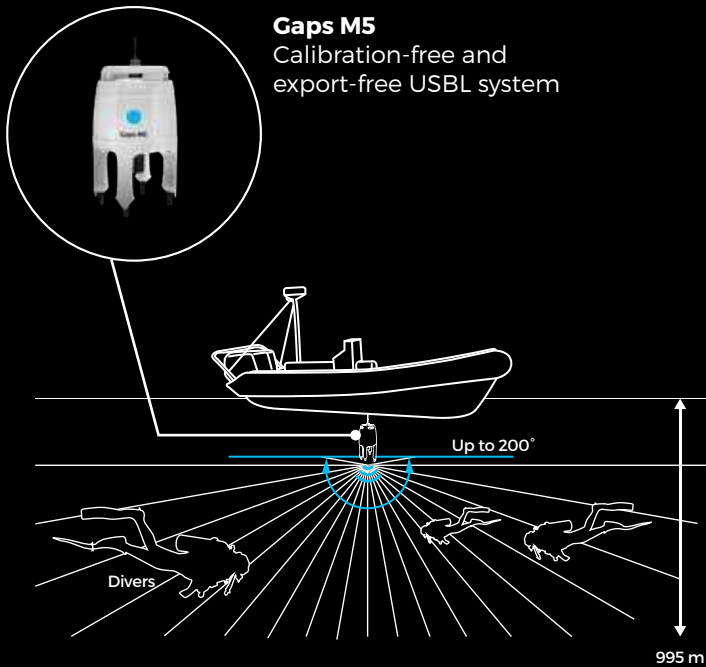
There are no immediate plans to go to Antarctica, but perhaps there will be an opportunity in the future to complete that life-long ambition. ■

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A BRIEF HISTORY OF THE AUSTRALIAN HYDROGRAPHIC SERVICE

By **Kevin Slade, PSM & John Perryman, CSM**

This article was written in collaboration with the late Lieutenant Commander Kevin 'Shotgun' Slade, PSM, RAN (Retd).

It was not intended to be a collaborative piece but when he passed away suddenly on 21 January 2020, I was approached as one of his many long-time friends, to review and complete the work.

Shotgun's experience in the RAN ranged from active service in Vietnam as a young sailor in HMAS *Sydney (III)* to serving in areas as far-flung as Antarctica and the Pacific as a member of the RAN's Hydrographic Branch.

His enthusiasm for capturing and recording the history of the 'doggies' was unbridled and his contribution over many years has helped to cement the role of the hydrographers in the annals of the RAN.

A commemorative service for Kevin Slade was held at Bulli, NSW on Tuesday 4 February 2020 – hardly surprisingly there was standing room only for those who came to pay their respects. Rest in peace old friend.

- **John Perryman**

Hydrographic surveying in Australia began with Lieutenant James Cook's first charting of the eastern seaboard in HM *Barque Endeavour*.

Cook's work was followed by voyages of exploration around the Australian coastline conducted by Matthew Flinders, Nicolas Baudin, Phillip Parker King, John Wickham, John Lort Stokes, Francis Blackwood, Owen Stanley, William Bligh, James Grant and others until, by the mid-19th century, the shape of the Australian continent and most of its coastal waters was known.

The story of the Australian Hydrographic Service from those early beginnings to the internationally respected organisation it is today is

one of resourcefulness and persistence, spurred on by the strategic and economic interests of our island nation.

ORIGINS OF THE RAN HYDROGRAPHIC SERVICE

Before federation, the Australian colonies contributed to the conduct of hydrographic surveys and from 1908 the Commonwealth Government paid the Royal Navy half of the cost of surveys carried out in Australian waters. Those surveys were later supported by staff in the Admiralty Chart and Chronometer Depot first established in Sydney in 1897 and later taken over by the Royal Australian Navy in 1913, at which time it became known as the RAN Hydrographic Depot.

WORLD WAR I

At the outbreak of World War I, the Royal Navy surveying ship on the Australian Station was HMS *Fantome*. Her surveying duties ceased in November 1914 when the ship was transferred to the RAN, armed and detached for blockade and patrol service operating chiefly in the Bay of Bengal, the Andaman and Nicobar Islands.

In the absence of Royal Navy survey ships on the Australian Station, very little survey work was undertaken by the RAN, an exception being a survey conducted by HMAS *Una* of Sewa Bay at Normanby Island, New Guinea in 1915.

Following the Great War, the Admiralty informed the Australian Government that “no increase in the Admiralty Surveying Service in ships or personnel can be hoped for and the immediate need for work in Home Waters renders it impossible to divert vessels for further surveying in the Dominions”.

THE INTER-WAR YEARS

The question concerning the creation of an Australian hydrographic

department came to a head in the 1919 Naval Defence Report, which provided the Australian Government with alternative models on which to base a hydrographic service – be it naval or civilian. It was subsequently decided that the RAN would form its own Hydrographic Service, funded from within the naval budget.

The RAN Hydrographic Service was officially formed on 1 October 1920, with Captain John F. Robins, RAN, being appointed its first hydrographer and Mr Cyril Woodhouse its first cartographer in January 1921. By that time, *Fantome* had resumed surveying duties, complemented by the sloop HMAS *Geranium*.

In 1922, the Hydrographic Office was re-located to Victoria Barracks, Melbourne, and for the next five years the Admiralty maintained a Royal Navy surveying ship in Australian waters, with HMS *Herald* replacing *Fantome* in 1926.

In response to calls for a modern survey of the Great Barrier Reef, HMAS *Geranium* was tasked to proceed to Queensland waters in February 1924. The strategic and commercial value of this task was of great importance to Australia and to aid in the assignment the ship was modified to carry a small Fairey III D aircraft for the purpose of aerial reconnaissance. She was later joined by HMAS *Moresby*, another former Royal Navy sloop, commissioned in the RAN on 20 June 1925.

In 1927, *Geranium* was paid off but *Moresby* continued the survey until the end of 1929, at which time she was placed in reserve following drastic Defence cuts owing to the Great Depression. With few vessels conducting surveys in Australian waters, it was hardly surprising that growing dissatisfaction among commercial shipping circles led to Ministerial intervention.

In 1937, the Ministers for Defence and Commerce appointed a technical committee to make recommendations

concerning increasing survey operations, having regard to safety of navigation, cost and the period over which survey work would have to be spread.

With a possible war looming, conditions in England required all services to be committed to rearmament and the Admiralty could offer little assistance. Moresby at that time was fully engaged on strategic surveys and if this important work was to continue, Australia would have to come up with other solutions. This would see a variety of RAN vessels and craft taken up from trade and take on surveying duties in the ensuing years, including a number of Bathurst Class minesweepers and Harbour Defence Motor Launches.

WORLD WAR II

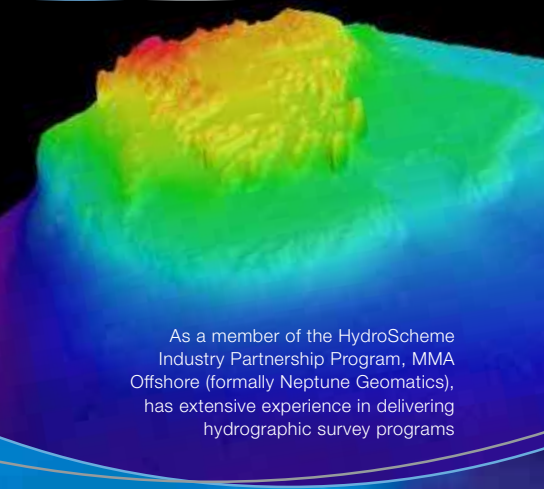
When the Pacific War erupted in December 1941, the Allies possessed very poor chart and map coverage of strategic areas including the Solomons, New Guinea and Northern Australia, where large areas remained unsurveyed. Rapid hydrographic surveys would be vital to making these reef-strewn waters safe for warships and this work was entrusted to various hydrographic and topographic units. In the South West Pacific, the task of surveying New Guinea was given to the Royal Australian Naval Surveying Service.

By then, *Moresby* was back in service performing escort duties, but at times she resumed her old trade, carrying out surveys of the Great North East Channel, Great Barrier Reef openings, Blanche Bay and Rabaul Harbour.

In July and August 1942, hydrographic information provided by the small surveying tender HMAS *Kwato* enabled ships to move into Milne Bay while preliminary surveys by HMA Ships *Whyalla*, *Stella* and *Polaris* were to prove invaluable during the Buna campaign.

As Allied armies advanced during 1943, RAN surveying ships were formed

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into Task Group 70.5, part of the US Seventh Fleet, and the Australian Hydrographic Service was designated the charting authority for Allied naval forces in the South West Pacific.

During 1944, Australian surveying vessels undertook several daring exploits as part of forces conducting initial operations preceding amphibious landings. The corvette HMAS *Shepparton* surveyed a channel through the Japanese-controlled Dampier Strait prior to the landing at Cape Gloucester. For the occupation of the Admiralty Islands, HMAS *Benalla* accompanied the invasion force undertaking a survey of Seeadler Harbour while it was still partly in enemy hands. In the landings that followed, surveying vessels routinely formed part of mine-sweeping flotillas, marking cleared channels and undertaking important preliminary surveys.

The Australian Hydrographic Service also participated in landings at Morotai, Leyte Gulf, Lingayen Gulf, Subic Bay, Zamboanga, Mindanao, Tarakan, Brunei Bay and Balikpapan. It conducted surveys across Australia's northern waters and through the Timor and Arafura Seas, including waters largely unsurveyed since the days of the early navigators. This work provided a swept navigational route for battleships transiting from the Indian to Pacific Oceans, and the mine sweeping and survey operations through the restricted waters of Torres Strait enabled ships of all sizes to safely use it by day or night.

Three notable hydrographic surveyors were killed in action during 1941 and 1942. Commander W.H. Martin, RAN, was lost when HMAS *Perth* was sunk during the Battle of Sunda Strait. Lieutenant Commander R.W. Rankin, RAN, was killed at his post while in command of HMAS *Yarra* when she was engaged by overwhelming Japanese naval forces while escorting a convoy south of Java; and Lieutenant G.W.A. Langford, RAN, was killed when a

German U-Boat torpedoed and sank HMAS *Parramatta* in the Mediterranean on 27 November 1941. Their loss was deeply felt across the fledgling surveying community.

Despite its small number, Australia's surveying service received an impressive list of awards and decorations during World War II, including two Order of the British Empires (OBE), 13 Distinguished Service Cross (DSC), four Distinguished Service Medals (DSM), 14 mentions in despatches, as well as United States Legion of Merit awards. In addition, Commander KE Oom, OBE, RAN, was awarded the Gill Memorial Award by the Royal Geographical Society of London in recognition of the RAN Surveying Service's contribution to the geographical knowledge of New Guinea waters.

By 1945, the Royal Australian Naval Surveying Service comprised the RAN sloops *Warrego* and *Moresby*; the frigate *Lachlan*; the corvettes *Benalla*, *Shepparton*, *Horsham*, *Echuca* and *Castlemaine*; the trawlers *Stella*, *Polaris* and *Winter*; the lighthouse tenders *Cape Leeuwin* and *Bangalow*; and three harbour defence motor launches.

THE POST-WAR ERA: 1946 TO 1960

The Australian Federal Cabinet considered the future of the Australian Hydrographic Service in 1946, determining that the RAN would remain the charting authority for hydrographic surveys of Australian waters and of Australian spheres of influence in the Pacific. Cabinet also endorsed a 25-year program to achieve this purpose.

HMA Ships *Warrego*, *Lachlan* and *Barcoo* were employed as survey ships between 1946 and 1948, surveying the southern Great Barrier Reef, Spencer Gulf, Bass Strait and the north-west coast of New Guinea. Three years later, manning and other difficulties forced the RAN to reduce the surveying ships' complements but harbour surveys

continued from ships immobilised at Sydney.

In 1947, the RAN Hydrographic Service commissioned the unusually named HMAS *Wyatt Earp* to support Antarctic exploration. Under Commander K.E. Oom, RAN, she sailed from Hobart on 26 December for Antarctica. Her objectives included a reconnaissance of the coastline of King George V Land, to evaluate the prospects of establishing an Australian base in the Commonwealth Bay area. However, while to the south of Macquarie Island, she was plagued with mechanical defects and ordered back to Williamstown, Victoria. She sailed again on 8 February 1948, carrying out a running survey of the Balleny Islands. On her return voyage she called at Macquarie Island, rendezvousing with HMA *LST 3501* that was landing an expedition on the island.

For three years, no progress was made on the national survey but in 1952 surveying was resumed by HMA Ships *Warrego* and *Barcoo*. In 1958, HMAS *Paluma* commissioned, joining them in this important endeavour.

On 22 June 1959, the river Class frigate HMAS *Diamantina* recommissioned as an Oceanographic Research Ship, under the command of Lieutenant Commander Bruce D Gordon, RAN. Over the following two decades she undertook oceanographic survey duty, mainly off the Western Australian coast and in the Indian Ocean and Java Sea. During those surveys she carried scientists from the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and assisted the Australian Army Survey team on the north-west coast of Australia.

In February 1960, scientists aboard *Diamantina* discovered a fissure in the ocean floor west of Cape Leeuwin that dropped to depths of over 4,000 fathoms. Now known as the *Diamantina*

Trench, it is believed to be the deepest recorded water in the Indian Ocean.

RAPID CHANGE: 1961 TO 1973

Discoveries of large mineral deposits led to a dramatic increase in Australia's export earnings during the 1960s and early 1970s. It also changed the type and size of shipping used to transport Australia's export commodities. The opening of new ports and a rapid increase in the tonnage of shipping was to shape the work of the AHS for the next 15 years.

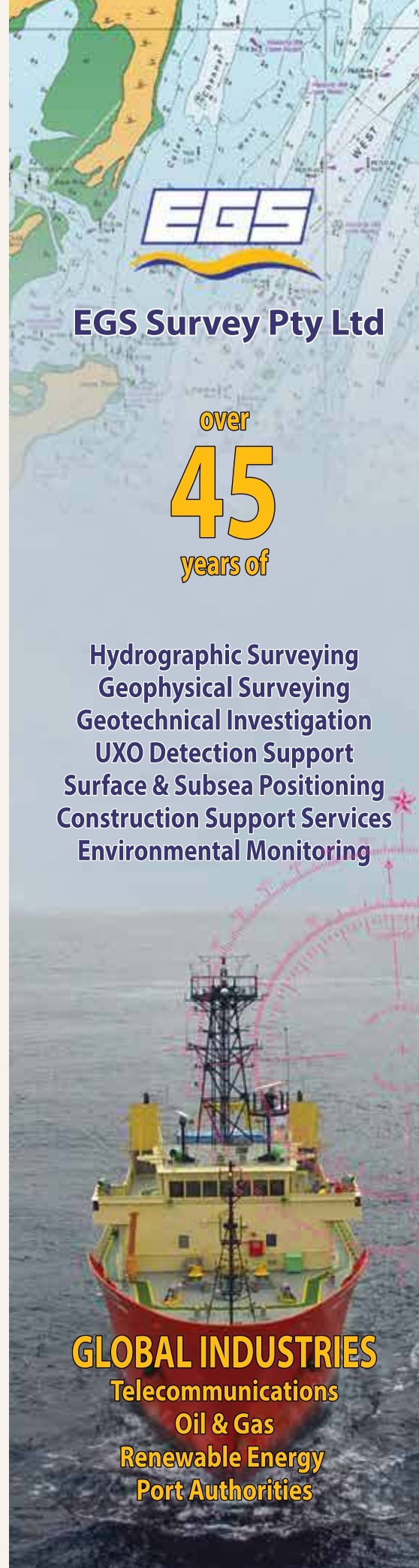
HMA Ships *Barcoo*, *Warrego* and *Paluma* subsequently conducted surveys of new deep draft shipping routes through the Great Barrier Reef, Torres Strait and the Gulf of Carpentaria and of the approaches to the new mineral ports of Weipa, Port Hedland, Dampier and Gove. The commissioning of HMAS *Moresby (II)*, Australia's first purpose-designed survey vessel, replaced *Barcoo* and *Warrego* in 1964. By 1992 she had attained an impressive 1 million nautical miles in the course of her surveying duties.

In 1966, the RAN Hydrographic School was established at HMAS *Penguin*, Mosman, NSW. Today it is known as the Maritime Geospatial Training Centre and it continues to train naval officers and sailors to international standards.

During the 1960s, the face of hydrographic surveying changed with the fitting of Decca, LAMBDA and HI-FIX electronic position fixing systems to survey ships. These systems replaced visual and radar position fixing, remaining in service until the late 1970s.

NEW TECHNOLOGY AND OPPORTUNITIES: 1973 TO 1993

By the mid-1970s, the surveys of main deep draught shipping routes and approaches to key mineral ports around Australia had been completed to modern standards, clearing the way for increased usage.



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On 27 April 1973, a new hydrographic survey ship (small) HMAS *Flinders* commissioned in the RAN as a replacement for HMAS *Paluma*. Named after the famous Royal Navy navigator and cartographer, she was to spend much of her service life surveying the Great Barrier Reef, Papua New Guinea and the Coral Sea. In 1974 she was the first RAN ship to enter Darwin following the devastation caused by Cyclone Tracy, clearing the way for seaborne relief efforts.

Transit Satellite Navigation systems entered service in 1973 for offshore surveys, followed by shore-based systems to establish geodetic control. LAMBDA and HI-FIX were replaced by Cubic Western ARGO with thermal generation power supply, Motorola Mini-Ranger became the new short range electronic position finder with wind and solar power generation, and new shallow and deep water echo sounders replaced systems which had been in use for 30 years.

The Hydrographic Logging and Processing System (HYDLAPS) was installed in RAN hydrographic ships

in the years that followed and the Autochart System entered service in 1978 for the production of nautical charts. The Global Positioning System (GPS) replaced other electronic position fixing systems in the late 1980s.

Complementing the work of the RAN's hydrographic ships was the oceanographic research ship HMAS *Cook*. Commissioned in the RAN on 28 October 1980, she replaced HMAS *Diamantina* in the oceanographic research role. *Cook* was the first RAN ship specifically designed for oceanographic duties, remaining in commission until 1990 having undertaken a number of important scientific deployments.

A Laser Airborne Depth Sounding (LADS) capability was introduced in 1993. The system used the difference between the sea surface and the sea floor as calculated from the aircraft's altitude to generate hydrographic data. Initially, a modified Fokker F27 aircraft, supported by a ground-based processing and validation unit, was used. Later the system was refitted to a Hawker De Havilland Dash 8 in 2010.

In relatively clear coastal waters, LADS proved to be highly effective. Its productivity and area coverage was so good that surface units were routinely not tasked to these areas. In regions of poor water clarity, LADS was a complementary capability to surface survey units. More than 26 years after the first experimental laser flew, this Australian-designed system remained at the forefront of both laser-based systems and hydrographic survey systems in general. In total, the LADS Flight flew more than 3,000 sorties, conducting 186 surveys and covered an area of more than 50,000 square kilometres. It was withdrawn from service on 6 November 2019.

In 1979, the Australian Government instituted a program to establish a hydrographic capability in the Solomon Islands under the Defence Co-operation Program (DCP). This saw a Chief Petty Officer Survey Recorder (CPOSR) posted to the Solomon Islands Marine Division (SIMD) in Honiara. The AHS also chartered a Department of Transport vessel, MV *Cape Pillar*, and with a small contingent of hydrographic personnel

embarked, conducted surveys in the waters of the Solomon Islands, Vanuatu and Samoa from 1982 to 1989.

A similar program operated in Vanuatu from 1987 to 1995, while in Fiji several hydrographic officers assisted in supporting that country's hydrographic program during the 1980s. Australia also assisted South West Pacific countries by providing hydrographic and cartographic training at the Hydrographic School in Sydney.

In 1985 the AHS resumed Antarctic operations, conducting survey reconnaissance at various Australian Antarctic stations. The Hydrographic Office Detached Survey Unit (HODSU) commenced annual deployments in 1987, which continued for 15 years using the Survey Motor Boats *Deliverance* and *Wyatt Earp*. When not on Antarctic duties, HODSU conducted surveys throughout Australia, deploying on active service during the INTERFET Operation in East Timor in 1999-2000.

From 1989 to 1990, four new survey motor launches (SML) HMA Ships *Paluma*, *Mermaid*, *Shepparton* and *Benalla* were commissioned in the RAN. Designed for operations in the shallow waters of northern Australia, they generally operate in pairs with their twin hull design providing good stability in most conditions. Each SML carries the latest in survey and computerised hydrographic data processing equipment and is fitted with the latest navigation aids.

1994 TO PRESENT

In 1994, the Australian Hydrographic Office moved to its current location in Wollongong. It remains a repository for hydrographic information in Australia, preserving many original surveys, hydrographic and oceanographic data and archival copies of published Australian and British Admiralty charts.

In 1997, HMAS *Moresby* decommissioned and *Flinders* followed soon after in 1998. Two new vessels,

HMA Ships *Leeuwin* and *Melville*, commissioned in Cairns in 1999, and along with the survey motor launches, LADS flight and Deployable Geospatial Support Team (DGST), they assumed responsibility for the hydrographic survey of Australia's area of charting responsibility.

Throughout the first two decades of the 21st century, the Australian Hydrographic Service continued conducting frequent surveys around the Australian coast and in the South Pacific. At times its ships and personnel have also contributed to constabulary, humanitarian and military operations.

Between October 2008 and December 2009, one of the Hydrographic Branch's most senior members, Commodore Bruce Kafer, AM, CSC, RAN, was appointed in command of two combined task forces, CTF158 and CTF152, in the Arabian Gulf. There he was responsible for the coordination and execution of maritime security and interception operations in the Middle East Area of Operations. He was later appointed the commandant of the Australian Defence Force Academy from 2009-2013.

Several of the RAN's hydrographic ships performed important border protection duties in support of Operation RELEX. Others rendered assistance to the civil community in the wake of natural disasters such as Cyclone Debbie that crossed the coast of Queensland in 2017. In other maritime operations, hydrographic ships have actively participated in a number of major exercises, proving their worth in simulated minefield lead-through operations and other specialised tasks.

On 6 August 2017, HMAS *Melville* was instrumental in locating the wreckage of a United States Marine Corps (USMC) MV-22 Osprey aircraft that ditched in the vicinity of Shoalwater Bay during exercises killing three US Marines. Using the ship's Towed Lightweight Side Scan Sonar, the wreck of the aircraft was discovered in short order in 59 metres

of water. This enabled the aircraft and the remains of those on board to be recovered. *Melville's* crew was among 107 ADF personnel whose efforts were recognised through the award of a Meritorious Unit Citation later presented by the USMC.

On 16 October 2017 the Defence Legislation Amendment Bill 2017 was passed, receiving Royal Assent to consolidate the Australian Hydrographic Office into the Australian Geospatial-Intelligence Organisation (AGO). Later that year, in December, Commodore Fiona Freeman, RAN, was appointed the first female Australian Hydrographer.

Today the Australian Hydrographic Office is responsible for providing Australia's national charting service under the terms of SOLAS and the Navigation Act 2012. This role requires provision of nautical charting and associated services in support of maritime safety, the coordination and determination of policy and standards that cover both hydrographic surveying and charting, as well as contributing to the coordination, exchange and standards related to maritime geospatial data in general.

The AHO is also responsible for providing direct support to the Australian Defence Force (ADF) by providing hydrographic, charting, oceanographic and meteorology services.

Over the last 100 years, the RAN's hydrographic personnel have contributed significantly to preserving maritime security in peace and war. Their work often takes place in the remote far reaches of Australia and its surrounds, well out of sight of the many who make use of the charts and other important navigational data produced by them. When warships of the RAN fleet deploy, they do so confident in the navigational data provided by the ships and personnel of the Navy's survey fleet. ■

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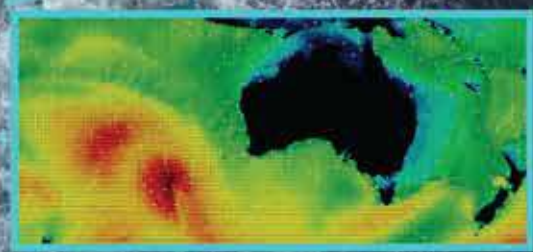
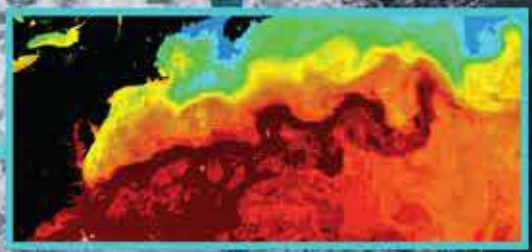
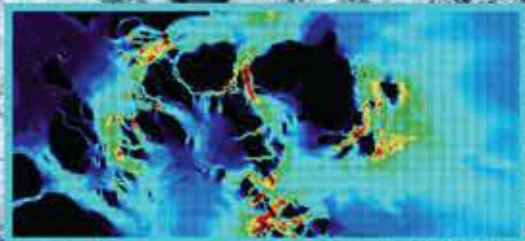
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HYDROGRAPHIC OFFICE: LOOKING TOWARDS THE FUTURE FROM THE PRESENT



The Australian Hydrographic Office has celebrated a number of milestones and events this year, and is looking ahead towards future advancements.

Defence is currently preparing proposals for Government regarding the delivery of new capabilities to support the conduct of Military Survey activities. These activities will provide invaluable environmental data to the AHO to continue to support Defence operations, activities and exercises in the Australian maritime operating environment. Originally announced by MinDef in 2018 as

the Project SEA2400 Phase 1, or the Hydrographic Data Collection Capability, a new ship will be constructed at the Henderson shipyards in Western Australia. A potential candidate for a vessel to undertake this role is a variant of the Arafura Class OPV. The Arafura Class ships are based on the PV80 design and will be built in Australia by German shipbuilder Luerssen in partnership with Australian company

Civmec in the joint venture, the Australian Maritime Shipbuilding and Export Group (AMSEG).

20TH ANNIVERSARY FOR HMAS LEEUWIN AND HMAS MELVILLE

Currently, the AHO operates two ships, HMA Ships *Leeuwin* and *Melville*, which both celebrated their 20th birthdays in 2020, at the same time as the AHO turned 100.

Both vessels have had distinguished careers, and this was acknowledged by *Melville's* Commanding Officer, Commander Michael Kumpis, as he marked the 20th anniversary milestone.

"The last 20 years has seen these vessels take on a greater role within



“Our supporting role is to collect, decipher and disseminate to those who require it for decision making purposes, either in real time or the traditionally known methodical surveys.”

Navy, shifting from a primarily national charting focus towards border protection, enhanced regional engagement and the provision of maritime military geospatial information in the operational environment,” Commander Kumpis said.

Initially painted white, the *Leeuwin* Class ships were built by NQEA in Cairns, North Queensland, where they are also currently based.

At the time of entering service, the *Leeuwin* and *Melville* were a significant advance in terms of their ability to gather high quality hydrographic information at a much faster rate than the ships they replaced.

Due to their versatility, size and endurance, they proved themselves capable of an impressive variety of maritime tasks, and reflected their respective ships’ mottos “I Shall Maintain” for the *Leeuwin* and “With Determination” for *Melville*.

During their service, both ships supported whole-of-government

border protection operations *Relex* and *Resolute*, in addition to other bespoke tasking.

For their core hydrographic role, the specialised survey ships give the Navy fleet a significant capability across a number of disciplines, either operating alone or as part of a task group.

“The *Leeuwin* Class, with a world’s best hydrographic sonar system and the ability to deploy *Scaneagle* (the unmanned aerial vehicle built by Boeing subsidiary *Insitu*), added to the multidisciplinary versatility of the platform, makes the Hydrographic Survey vessel a valuable fleet asset,” said Commander Richard Mortimer, Commanding Officer of the HMAS *Leeuwin*.

The ships have proved on several occasions that they are more than surveying platforms.

During Exercise *Talisman Sabre* in 2017, the Hydrographic Survey ‘Blue Crew’ on HMAS *Melville* were awarded

a Meritorious Unit Commendation for their role in the location and recovery of a US Marine Corps *Osprey* Aircraft which tragically crashed and sank off the Queensland coast.

Blue Crew were also awarded the Duke of Gloucester’s Cup – recognition as being the most effective and efficient ship in the entire Navy fleet – for 2017 by HRH Prince Charles, the Prince of Wales, for a series of multi-discipline activities around the Australian coastline and through the SW Pacific and SE Asia.

Both *Leeuwin* and *Melville* have been deployed internationally as part of the Enhanced Regional Engagement Program across the South-West Pacific and South-East Asian regions, undertaking valuable relationship-building work with Australia’s neighbours.

“The *Leeuwin* Class Hydrographic Ships have provided outstanding service across a wide range of changing and expanding roles over the last 20 years, including non-core roles in Border Protection and Regional Engagement,” said Captain Bryan Parker, Commander Mine Warfare, Hydrographic and Patrol Boat Force.

“The adaptability of their crews to meet these challenges with success has been of great credit to them and to Navy.”

WORLD HYDROGRAPHY DAY 2020

World Hydrography Day was held on 21 June and HMAS *Melville* marked the occasion at sea performing ongoing survey operations in the vicinity of Shoalwater Bay.

Melville’s work will improve the quality of charts and strengthen the knowledge of local tide dynamics, information which is crucial to the continuing understanding of the environment.

The work will also have a practical application for naval operations, with Exercise *Talisman Sabre* conducted every two years in the same area.

“With a foremost understanding of the

surrounding space above and below the water, the war fighter can take advantage of the information provided both tactically and strategically, to allow them to gain the edge over an opponent," *Melville's* executive officer, Lieutenant Commander Adrian Eddy, told Navy Daily in June.

"Our supporting role is to collect, decipher and disseminate to those who require it for decision making purposes, either in real time or the traditionally known methodical surveys."

In 2019, *Melville* first deployed three Slocum Gliders as part of the SEA2400 trials, to collect oceanographic data from the sea surface to depths approaching 1,000m over a four-week period for use in better understanding and exploiting the marine environment.

These UAV were deployed once again on World Hydrography Day, in keeping with the 2020 theme of autonomous technologies.

The benefits of a better understanding of the marine environment are two-fold: they allow for a significantly increased understanding of the risks for maritime units entering questionable or unfamiliar waters, allowing them to operate more safely and efficiently, while at the same time it provides Navy and Defence an incredible strategic, operational and tactical advantage over an adversary to maximise the effectiveness of weapon systems and warfighting manoeuvre.

NAVAL OFFICER IN GEOSPATIAL TRAINING

The second Navy participant in the Army's Geospatial Officers' Course graduated from the Defence Force School of Intelligence in Sydney in June 2020.

Lieutenant Andrew Taylor, a Maritime Geospatial Officer – Hydrography – who is posted to HMAS *Melville*, completed the eight-week course which covers geospatial theory and products in addition to capability and command.

The course culminated in a four-day

scenario-based assessment, which delivered insights and skills which Lieutenant Taylor said would be invaluable for his work on HMAS *Melville*.

"Course highlights included the opportunity to work with my Army geospatial colleagues and visit several civilian geospatial organisations," he said.

"It provided a valuable insight into the role of Geospatial Officers in the wider Australian Defence Force."

AHO INDUSTRY PARTNER TO SURVEY GULF ST VINCENT

Survey and geotechnics company Fugro has been selected to chart the waters of South Australia's Gulf of St Vincent and Investigator Strait as part of the Australian Government's HydroScheme Industry Partnership Program (HIPP).

The 998km2 survey will be conducted on behalf of the Australian Hydrographic Office (AHO), which will use the data to update nautical charts for safer navigation. Data will also be shared with scientific agencies, including Geoscience Australia and the national AusSeabed community.

This area within Gulf of St Vincent and Investigator Strait is the major waterway for the approach to Port Adelaide and features adjacent marine parks and habitat protection zones of national environmental significance.

Fugro will deploy a new uninhabited surface vessel (USV), Fugro's Autonomous Surveyor-900 (FAS-900), to expedite data collection – the first time this technology has been deployed in Australia for the AHO – and a demonstration of the innovations being developed to improve the safety and efficiency of data collection in the marine estate.

Fugro will also utilise other technologies developed in Australia, including remote operations centres (ROCs) and Back2Base data transfers, to achieve significant environmental, safety and efficiency gains.

"Fugro is proud to be supporting

the AHO as part of the HIPP," said Mark Sinclair, Director of Hydrography for Fugro in Asia-Pacific. "Long-term strategic partnerships help support innovation, such as our USV for faster data acquisition, and contribute to developing an enduring national hydrographic industry."

The nautical charts of the Gulf of St Vincent and Investigator Strait that support marine traffic, fishing, tourism, recreational boating and environmental management currently consist of historical data of varying reliability, some going as far back as Matthew Flinders and Nicolas Baudin in the early 1800s.

US OCEANOGRAPHER IN APRIL VISIT

Rear Adm. John Okon, Commander, Naval Meteorology and Oceanography Command (NMOC), travelled to Australia in March for an engagement and familiarisation visit with the AHO, the Australian Geospatial-Intelligence Organisation (AGO) and Royal Australian Navy (RAN) Meteorology-Oceanography (METOC) activities.

It was the first visit by the head of the United States Navy's operational meteorology and oceanography command in more than 20 years.

"RAN/AGO and Fleet METOC are great friends. Our partnership is critical because we cannot, and should not, go it alone sensing, collecting data and predicting the physical battlespace. We must leverage each other's capabilities to build a stronger partnership and maximise our combined resources," Admiral Okon said.

Commodore Fiona Freeman, Hydrographer of Australia and Director-General Hydrography and METOC, offered the invitation after Royal Australian Navy and AGO visits to United States Naval Oceanography commands highlighted opportunities for further collaboration.

Rear Adm. Okon's four-day trip included visits to the AHO, Fleet Base

East in Sydney, Australian Defence Headquarters in Canberra, AGO and HMAS Cairns Naval Base.

He was able to visit the lead ships of two Classes of Navy's Hydrographic and Oceanographic survey ships: HMAS *Leeuwin* (A245), lead ship of the *Leeuwin* Class of deep ocean hydrographic survey vessels, and HMAS *Paluma* (A01), the lead ship of the *Paluma* Class shallow coastal survey vessels.

"These vessels are impressive and agile. The professionalism of the crews and the capability are world-Class," Okon said.

HYDROSCHEME INDUSTRY PARTNERSHIP PROGRAM COMMENCES

A long-term partnership between Defence and members of Australia's hydrographic industry was announced in February with the commencement

of the new HydroScheme Industry Partnership Program.

Chief of Navy, Vice Admiral Michael Noonan, AO, RAN said that through the program, industry will be able to use the latest hydrographic techniques and state-of-the-art equipment to deliver quality hydrographic data to Defence, which charts and disseminates this information.

"The HydroScheme Industry Partnership Program is a \$150 million government investment in Australia's commercial hydrographic industry over the next five years," Vice Admiral Noonan said.

"This is the first step in an ongoing partnership with Australia's commercial hydrographic industry."

Under the International Convention for the Safety of Life at Sea 1974, the Australian Government has an international obligation to provide hydrographic services covering the Australian Charting Area.

AHO HOSTS SOUTH-WEST PACIFIC PARTNERS

Shaping strategic policy in the fields of hydrography, nautical charting and related navigational safety was the focus of the South West Pacific Hydrographic Commission Meeting, held in Wollongong in February 2020.

Members of the South West Pacific Hydrographic Commission worked together to improve maritime safety through hydrographic capacity building and forging strong connections as a maritime community.

Commodore Fiona Freeman, RAN, Hydrographer of Australia, hosted the event and said it presented an opportunity for delegates to discuss developments in surveys, charting and maritime safety information.

"The Australian Hydrographic Office is the nation's official hydrographic agency, responsible for meeting Defence's



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obligations for provision of nautical charts, products and services under the Navigation Act," Commodore Freeman said.

"Defence, through the Australian Hydrographic Office, is working with its counterparts to strengthen the South West Pacific region's hydrographic capability and safe use of the maritime environment, which are important to the region's security and economic development.

"Australia is a maritime nation, and we share a reliance on the Pacific Ocean with our neighbours in the region. The South West Pacific Hydrographic Commission meeting provides us with a unique opportunity to engage as partners in this vitally important area.

"I welcome the government, international organisations and industry representatives from 15 nations as we work together to optimise the safe use of the maritime environment."

PROPULSION UPGRADE ON HMAS MELVILLE

Engineering innovation by technical sailors onboard HMAS *Melville* has resulted in an increase in the maximum propulsion power available to support the ship's involvement in task group operations while improving the normal operating conditions for essential machinery.

The Propulsion Motor Room (PMR) in hydrographic ships houses the ship's main motors and gearboxes.

This equipment generates heat through its normal operation and the maximum propulsion output of the ship has previously been defined when operating in tropical climates by how effectively this heat can be dissipated.

Under the leadership and technical guidance of Petty Officer Marine Technician (POMT) Ryan Schweitzer, the technical department in *Melville* undertook a technical

investigation to determine if the PMR could be cooled more effectively, thereby allowing the ship to operate its drive train at higher speeds.

A broad cross-section of the ship's technical department was involved in thermographic mapping, airflow analysis and ambient air monitoring in order to prototype enhanced ventilation systems for the compartment using resources available on board in innovative ways.

Following testing and refinement of the enhanced ventilation system, analysis showed that the enhanced ventilation design reduced the localised build-up of hot air around sensors and drive equipment.

This allowed the ship to achieve greater performance from its drive train, allowing *Melville* to travel at higher average speeds while giving the added benefit of reducing the load on the propulsion train when operating at lower speeds. ■

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BUILDING FOR THE FUTURE: NAVAL SHIPBUILDING AND FLEET SUSTAINMENT

The period between now and at least the mid-2030s will be a busy time for the Royal Australian Navy in terms of shipbuilding and sustainment.
By **Nigel Pittaway**.



At the present time there are no fewer than five onshore build programs underway, with another two vessels shortly to arrive in Australia for completion and fit-out. In addition, Navy has recently taken delivery of its third and last Hobart Class destroyer, HMAS Sydney, and its Anzac Class frigates are undergoing significant capability upgrades.

The National Naval Shipbuilding enterprise is currently overseeing construction of five different Classes of vessels for the RAN, Australian Government and Australia's Pacific neighbours. These include Attack Class submarines at Osborne in South Australia; Hunter Class anti-submarine warfare (ASW) frigates at Osborne; Arafura Offshore Patrol Vessels (OPVs) at both Osborne and Henderson in Western Australia; and Guardian and Cape Class Patrol Boats at Henderson. In addition, the first of two Supply Class Auxiliary Oiler Replenishment (AOR) ships will arrive in Western Australia later this year for completion and fit-out, following construction by Navantia in Ferrol, Spain.

Against this backdrop of shipbuilding activity, the current fleet needs to be adequately sustained to ensure it is capable of meeting its days at sea requirements while the new ships and submarines enter service. To achieve these parallel requirements, Navy's partnership with defence industry is of paramount importance and even beyond the current COVID-19 restrictions there are significant challenges ahead. One major challenge involves growing a skilled workforce capable of sustaining the drumbeat of ships and submarines entering the water while ensuring sustainment levels meet current and future fleet requirements.

NATIONAL NAVAL SHIPBUILDING ENTERPRISE

To oversee the national naval

shipbuilding plan, a recent step has been the creation of the position of Deputy Secretary, National Naval Shipbuilding within the Capability Acquisition and Sustainment Group (CASG).

The position was created in 2018 on the recommendation of the Naval Shipbuilding Advisory Board, under the current leadership of Chairman Don Winter, which provides independent advice to government on naval shipbuilding matters. The present Deputy Secretary Naval Shipbuilding is Tony Dalton, who explains the organisation was initially formed within Defence to provide a higher level of focus on the enterprise, before being moved across into CASG.

"I am responsible to Secretary of the Department of Defence Greg Moriarty for the delivery of the National Naval Shipbuilding Enterprise, and that includes the delivery of Hunter, Arafura, Attack and Success Class vessels. I am also responsible for the sustainment of the current fleet and the maintenance of the policy framework that enables it," he says.

"The National Naval Shipbuilding office was set up in the centre of the enterprise to act as the policy organisation and co-ordinator across all the different activities within the enterprise. It is a means of standardising our approach to industry across what is quite a diverse range of activities. There are currently a lot of differences between the way we conduct some of our activities between different Classes of ships and submarines, across both acquisition and sustainment."

The standardised approach aims to both reduce complexity across the organisation and reduce costs which may in the past have transferred to industry because of different strategies used to achieve similar outcomes.

The National Naval Shipbuilding

office under Andrew Byrne is one of four divisions within the overarching Naval Shipbuilding Enterprise, which also includes the Ships Division, which looks after the acquisition of Navy's surface fleet and headed by Sheryl Lutz; the Submarine Division, responsible for both the acquisition of the Attack Class boats and Collins Class sustainment and upgrade, under Greg Sammut; and the Maritime Systems Division, led by Rear Admiral Wendy Malcolm, which is responsible for all of Navy's current surface fleet sustainment activities.

"Clearly, there is a very close relationship between the Ships



Tony Dalton



Rear Admiral Wendy Malcolm

>> Continued on pg.91



Steel in... Ships out at Osborne Naval Shipyard

The Osborne Naval Shipyard (ONS), formerly known as Techport, has expanded significantly over the past two years, now stretching across 109 hectares of the Lefevre Peninsula in South Australia.

Formed in March 2017, Australian Naval Infrastructure Pty Ltd (ANI), a Government Business Enterprise, was tasked with providing state-of-the-art shipbuilding infrastructure to facilitate the build of major surface combatant vessels and submarines in support of the Federal Government's Naval Shipbuilding Plan. ANI has acquired the existing shipyard, surrounding lands and buildings, and Common User Infrastructure, and has commenced the expansion and modernisation of the newly rebranded ONS into a world-class shipbuilding precinct.

The first expansion project – the Osborne South Development Project – commenced in late 2017 when ANI was handed a 90% design – developed by Capability and Sustainment Group (CASG) and Denmark designers,

Odense Maritime Technologies (OMT) – for a generic shipbuilding production facility. Lendlease was appointed by ANI as the managing contractor for the construction of the OSDP following a competitive tender process soon after, and OMT and its Australian designer partner, Aurecon, were appointed to continue their project involvement under a novated agreement.

The desired outcome was to expand the existing southern shipyard to enable 'end-to-end', fully integrated shipbuilding capability using the latest in automated and high production equipment and systems. The outcome has been achieved, and the new southern yard now supports a continuous build program for future vessels up to a 10,000T displacement, such as Destroyer class vessels.

The OSDP comprises four new industrial halls: a Steel Fabrication Hall, Block Assembly Hall, Blast and Paint Hall and Ship Consolidation and Erection Hall.

The new full-service Steel Fabrication Hall, fitted with the latest in steel handling, manufacturing and fabrication equipment from around the world, including fully-automated robotic welding stations, enables end-to-end Steel in... Ships out capability for the first time at the ONS.

The Block Assembly Hall facilitates the assembly of large blocks up to 400T and substantially increases the capacity and production capability of the southern yard overall. The Blast and Paint Hall, much larger than the existing facility, can now accommodate blocks up to 400T and operates in five modes.

At 50m high, 180m long and 90m wide, the Ship Consolidation and Erection Hall was built in sections on the ground, then rotated and lifted into place using strand-jacking. This methodology minimised the need for working at heights, improving safety



outcomes, and provided significant productivity benefits towards ensuring the project was delivered on time. Assembly and installation of two massive 200T overhead gantry cranes in this facility supports construction of vessels under cover, compared to previous open, dry berth consolidation and ship erection construction at the yard.

The ability to construct vessels inside these halls provides extensive gains in productivity through installed manufacturing and lifting equipment, reduced exposure to weather, and the ability to implement extended shifts for increased production if required.

Other buildings constructed as part of the OSDP include a new canteen with a large, fully equipped commercial kitchen, modularised change room buildings with solar and recycled water, and sound-proofed offices and staff amenities attached to each of the new halls.

Completed on time and within budget, the OSDP has now been handed over to ANI's Operation Team and a staged handover to shipyard operator, BAE / ASC Shipbuilding has since commenced. Prototyping for the Hunter Class Frigate Program is scheduled to commence later this year.

The next stage of development for the southern yards is the modernisation of the existing facilities, and the first building is scheduled for refurbishment and repurposing into a pipe workshop from September 2020.

In November 2018, delivery of Early Works (Phase 1) of the Osborne North Development Project (ONDP) – a bespoke submarine yard designed and constructed to suit the specific production needs of the Attack class submarine program – commenced.

The Early Works comprise two new land-based test facilities, a HV substation and fire pump station constructed on the northern section of the proposed Future Submarine Site at Osborne.

Planning and design of the Main Works (Phase 2) is also progressing, and Early Works and site preparation for this Phase of construction has commenced. The Main Works comprise production support halls, a main assembly hall and supporting ancillary buildings and workshops. This northern yard is significantly larger than the OSDP and will also provide end-to-end Steel in... Subs out capability.


The majority of these works are being delivered through ANI's appointed managing contractor, Laing O'Rourke, and design lead KBR, working in a collaborative manner with our future submarine yard operator, Naval Group Australia and CASG.

The largest ever infrastructure investment of its type in Australia's history, this is a revolutionary program of works at the ONS that supports the Government's commitment to building a strong, sustainable and innovative Australian naval shipbuilding industry.



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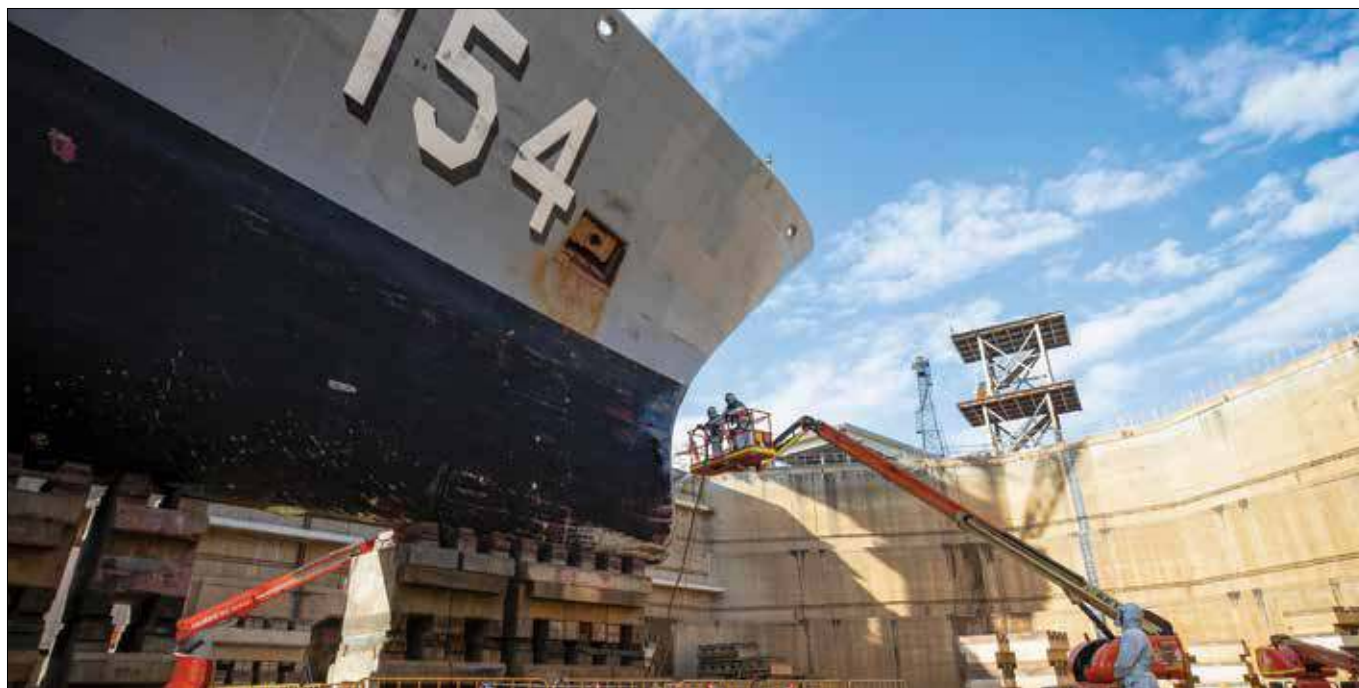
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>> Continued from pg.87

Division, which is acquiring surface ships, and Maritime Systems Division, which is sustaining them,” Dalton adds. “RADM Malcolm has parts of her team embedded with the acquisition organisation, because you need to have sustainment people on the ground from the very beginning.”

EXECUTING THE NATIONAL NAVAL SHIPBUILDING PLAN

From a Navy perspective, the three major shipbuilding programs are the Arafura Class OPV under SEA1180 Phase 1, Hunter Class ASW frigates under SEA5000 Phase 1 and the Attack Class submarines, being acquired under the overarching SEA1000 program.

SEA1180 Phase 1 is acquiring 12 OPVs based on Lürssen’s OPV80 design to replace Navy’s ageing Armidale Class Patrol Boat (ACPB) fleet. The first two vessels are under construction by ASC Shipbuilding at Osborne and the lead vessel, HMAS *Arafura*, is expected to enter service in 2021. Assembly of the third ship has now begun at Cvmec’s huge

new facility at Henderson and all subsequent vessels will be built in Western Australia.

SEA5000 Phase 1 will oversee construction of nine highly capable ASW-optimised frigates, to be built at Osborne by ASC Shipbuilding. The reference design for the Hunter Class ships is BAE Systems’ Global Combat Ship (GCS), which also forms the basis for ships under construction in the United Kingdom for the Royal Navy (Type 26) and in Canada for the Royal Canadian Navy (Canadian Surface Combatant). Prototyping construction of hull blocks is due to begin at Osborne in December and steel is expected to be cut for the first ship in December 2022.

Twelve large, regionally superior conventional submarines will be delivered by SEA1000 to replace Navy’s six Collins Class boats. The Attack Class submarines will be built at Osborne by ASC, in partnership with Naval Group Australia and work is continuing on the preliminary design. Construction work on the pressure hull of the first boat is expected to commence in 2024.

From a governance perspective,

Dalton explains that, while the naval shipbuilding enterprise is being led by Defence, it is actually a whole-of-government activity. Overseeing the program is the Secretary’s Committee for Australian National Naval Shipbuilding Enterprise (SCANNSE), currently chaired by the Secretary of the Department of Prime Minister and Cabinet, Philip Gaetjens.

“The committee includes the Secretaries of the Departments of Finance and Defence, the Chief of the Defence Force (CDF) and it picks up all the principal areas fundamental to the success of the enterprise, such as industry, employment and education,” Dalton says.

“So, we have a mechanism which has proven very effective in setting the framework for the success of the enterprise and, while it is not a risk-free environment, it does mean we have whole-of-government engagement.”

MANAGING THE RISK

Balancing Australia’s diverse and complex shipbuilding programs comes with significant risk and the task has not been made easier by the



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impact of COVID-19 and associated restrictions. However, Dalton says all the major programs are currently executing as expected.

"What we're seeing right now is that COVID-19 is not having a huge impact on our shipbuilding program, we're doing a lot of work with the industry primes to look at supply chain vulnerabilities," he explains.

"At this point in time, while some of the international logistics processes have become more challenging, they are all still working and the good news is that the long-lead items we need typically don't come to Australia by air freight. While the biggest impact on our logistics chain at the moment is a reduction in air freight, sea freight is still continuing."

Beyond COVID-19, an enduring challenge is to raise and sustain a skilled naval shipbuilding workforce to sustain five different and simultaneous shipbuilding activities focused in Osborne and Henderson, but which also have activities across Australia.

The Federal Government has created the Naval Shipbuilding College (NSC) at Osborne, managed by the Naval Shipbuilding Institute (NSI) – a joint venture between Kellogg Brown & Root and Huntington Ingalls Industries. The college is responsible for the co-ordination of education and training of personnel, beginning in 2018 with the establishment of industry workforce requirements.

"Through the college we engage with the tertiary institutions that support our professional workforce and the vocational educational training system that supports our blue-collar workforce. We also pick up the unions, the industry primes and our sub-contractor base and we regularly engage with them," Dalton says.

"We're managing a number of high-risk activities and, while each of the projects has strategies in place to

manage their risk, we need to consider it from an enterprise perspective as well. The largest strategic risk to the enterprise is the workforce risk and a lot of effort has been put into what our workforce demand is, particularly at the prime contractor level."

While the shipbuilding enterprise has traditionally competed with other industry sectors, such as mining, the impact of COVID-19 on workforce security may possibly work to Defence's advantage in the long term.

"It might actually be that we will go from an environment where it was difficult to attract individuals to shipbuilding, to one in which the long-term surety of a Commonwealth-backed series of projects becomes more attractive than it might once have been," Dalton adds.

"As a result, some of our risk calculations are changing, based on how the employment environment is changing in response to the pandemic."

SUSTAINING THE CURRENT FLEET

In parallel with the largest naval shipbuilding program in Australia's history, the current fleet needs to be sustained at a level to ensure fleet units remain available to meet sovereign tasking requirements. In addition to the ongoing operational sustainment activities, several major units, including the eight Anzac Class frigates and six Collins Class submarines, are the subject of current and/or future upgrade programs.

As a result, the sustainment activities are subject to similar challenges to that of the shipbuilding enterprise and rely heavily on partnerships with industry to meet Navy's requirements.

Recently, these challenges have also included restrictions imposed on society by COVID-19 but, as the person responsible for the ongoing upkeep of the fleet, Rear Admiral



Wendy Malcolm, Head of Maritime Systems Division, says fleet availability has seen no interruption.

Underlining this was the departure of seven ships from Fleet Base East in Sydney and Fleet Base West in Western Australia in June, for a series of post-refit trials and training activities. Some of those ships are also due to participate in the multi-lateral Rim of the Pacific (RIMPAC) exercise off Hawaii, in what is planned to be an extended deployment without a port visit.

“Right now, there has been no interruption to Navy availability at all, our assets deployed as planned. We wanted to make sure we had as many ships available and ready to sail as possible, so we tried to do as much of the planned or ongoing maintenance as possible,” RADM Malcolm adds.

“We needed industry’s help with that but we also looked within our own supply chain to see how we can get repairable items out into industry more quickly or make part-payments in order to help to have those repairs done more quickly. Industry has been very supportive, and they are working hand-in-glove with us. We have seen a really positive approach by both sides to deal with the challenges of COVID-19.”

INDUSTRY PARTNERSHIPS

A recent example of industry’s close partnership with Navy in the fleet

sustainment space occurred prior to COVID-19, when the Australian Defence Force was called upon to support local communities during the severe 2019/2020 bushfire season.

The Navy’s amphibious warfare ships were deployed at short notice to support threatened communities in southern New South Wales and eastern Victoria in December 2019, as part of the ADF’s Operation Bushfire Assist.

HMAS *Adelaide*, one of Navy’s two LHDs, was undergoing a maintenance period alongside at Fleet Base East when the call came. The ship was on 72 hours’ notice to put to sea and in the final stages of having one of her GE LM2500 gas turbine engines replaced and distribution fans repaired, with the assistance of personnel from General Electric Marine and Shadbolt Group. Despite this, the ship was required to sail to participate in Bushfire Assist within 48 hours of the call.

Although the maintenance work had not been completed, HMAS *Adelaide* sailed through Sydney Heads on task as directed, with the industry team still aboard and assisting their Navy colleagues, to ensure engineering and technical support was maintained. The six contractors remained aboard for the duration of the LHD’s assistance to Bushfire Assist and earned the praise of Adelaide’s Commander Engineer, Commander Tom Doherty.

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“Both GE and Shadbolt have provided professional, reliable and consistent quality technical support,” CMDR Doherty commented after the operation. “They have integrated well with the Marine Engineering Department and they are treated as part of the team in the ship.”

After the deployment, the contractors were personally thanked by Chief of Navy, Vice Admiral Michael Noonan and Minister for Defence Linda Reynolds. “It is a really great example of how we work hand in hand with industry,” RADM Malcolm comments. “Industry was just as keen to support us and make the ship operational as our Navy personnel were. They took great pride in doing that and they were an integral part of the success. Industry are often our silent partners in keeping the fleet at sea and it was great to see them in this case get the recognition they deserved, they did a terrific job.”

Other recent examples include industry contractors flying to the Middle East to assist with technical issues aboard one of Navy’s Anzac frigates and others are supporting the Pacific and Guardian class Patrol Boats operated by Papua New Guinea.

“We really want to try and use those best-of-class lessons across the fleet, but the biggest challenge for me, as we start building those new ships, is that we’re ready with well-understood and consistent approaches and we bring those ships into service as seamlessly as possible.”

THE FUTURE OF FLEET SUSTAINMENT

The sustainment methodology for each class of ship has traditionally been a bespoke approach, but the recently announced Plan Galileo seeks to take the best-of-class lessons from each of the individual activities and bring them together in a consolidated approach to future fleet sustainment.

“We really want to try and use those best-of-class lessons across the fleet, but the biggest challenge for me, as we start building those new ships, is that we’re ready with well-understood and consistent approaches and we bring those ships into service as seamlessly as possible,” RADM Malcolm says.

“I am working closely with (head of Ships Division) Sheryl Lutz to make sure we have learned those lessons from the past and we are ready.”

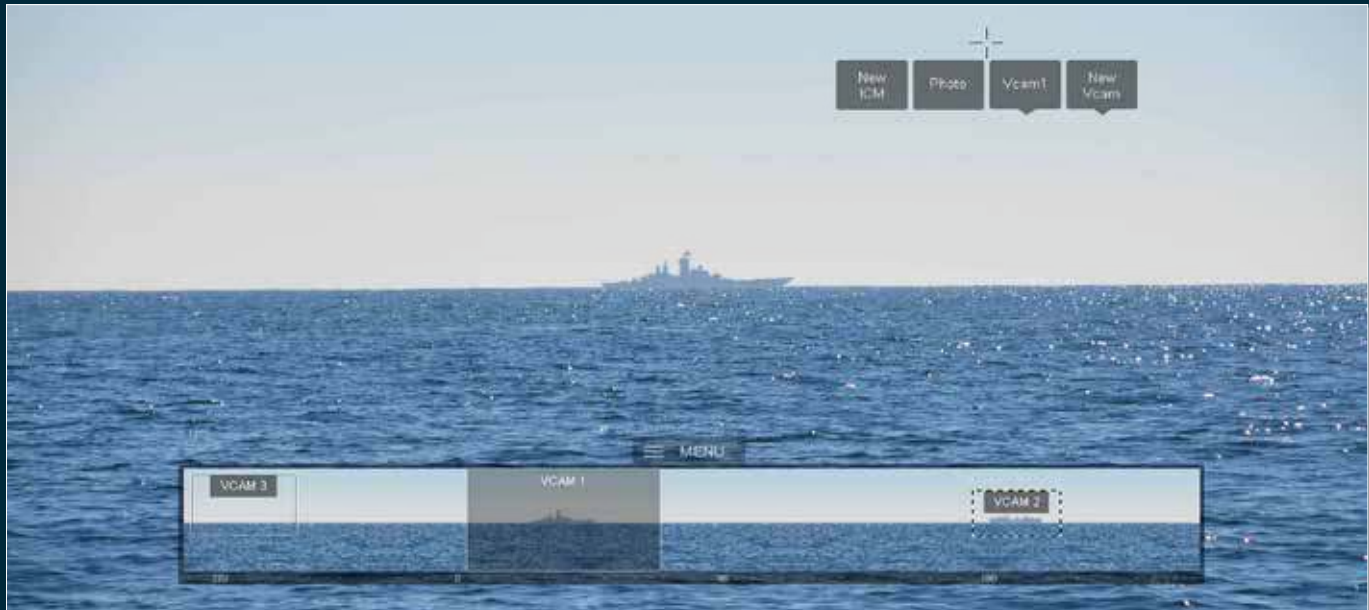
The replacement of much of Navy’s surface fleet in the coming two

decades will assist this approach, as will technological advances such as digital design and digital shipyards, both of which are features of the Hunter class and which provide opportunities to embed sustainment and logistics specialists early in the design process.

“We are utilising what we are learning out of the shipbuilding space and we are looking to take that into the sustainment space. We’re looking at gathering data for asset management, in terms of onboard monitoring of components and systems,” RADM Malcolm adds.

“There are also some great opportunities in the area of additive manufacturing for example, and we’re looking at how we might improve our supply chains, where we have vulnerabilities. There’s a lot of work going on and we’re looking to maximise the efforts that have gone on in shipbuilding from that perspective.” ■

FUTURE COMBAT SYSTEM DEVELOPMENT IN AUSTRALIA



When most people think of how a naval platform fights, the first thoughts are of guns, missiles and radar. These elements form part of the platform's combat system and they are essential to achieving any navy's mission to fight and win at sea. At the heart of the combat system is the combat management system (CMS), which integrates sensor information and provides situational awareness and decision support to the war fighter in both defensive and offensive action. This technology must be flexible and adaptable to enable rapid integration of new technologies to meet evolving threats.

Saab's 9LV CMS is the core of the combat capability on board the Royal Australian Navy's current Anzac class frigates and Canberra class LHDs and will soon enter into service with the new Supply class replenishment ships. Saab has been selected to

provide a 9LV based situational awareness system for the new Arafura class offshore patrol vessels. The Royal Australian Navy's fleet of nine Future Frigates and the three upgraded Air Warfare Destroyers will be equipped with US Navy's Aegis combat management system, with an Australian interface developed by Saab Australia. When commissioned, this commonality will provide the RAN with unique advantages in training, operation and support of the fleet.

Saab has built a solid reputation and formidable presence in Australia on the back of 9LV CMS delivery and performance. The company has the in-country capability of developing a range of new applications and features to evolve the 9LV system to meet the current and future unique requirements of the Australian customer.

What can we expect in the future

then? The major shift in combat system integration has been the evolution of the systems being interfaced. In the past the sensors and weapons had custom physical interfaces requiring complex hardware and software. They also had limited functionality and simply 'did what they were told'. The new generation of systems have digital interfaces and have a much higher degree of built-in intelligence, which both simplifies and complicates the integration task.

An example would be a decoy countermeasures system. In the past the decoy simply fired its rounds on command, with the optimisation of the deployment of the rounds done by the CMS, taking into account such factors as threat type, the current tactical picture and location of high value units. The latest generation of decoy countermeasure systems do their own threat processing,

target prioritisation and launch optimisation. It expects the CMS to feed it the necessary tactical data to calculate its response. That sounds great except that due to the proprietary nature of the algorithms in the decoy system, Saab has worked closely with its suppliers to understand how their systems work so they are integrated to provide the best solution.

So how will the CMS deal with emerging threats, such as hypersonic missiles, railguns and swarming drones? One way to counter these is to reduce the visible and electromagnetic visibility of the platform. A weapon that cannot see the target is ineffective. Future warships will need to be very stealthy and the CMS will need to know precisely the probability of detection against every type of sensor under real-time environmental conditions. Saab has had success in integrating sensor performance models, which provide real-time data on the performance of both ownship and hostile sensors in the current geographic location and environmental conditions.

New generation CMS will also incorporate Game Theory, using mathematics to model human decision making in competitive situations. It is ideally suited for analysing military situations because it depicts the realistic situation in which both sides are free to choose their best 'moves' and to adjust their strategy over time. The ship's combat team can analyse tactical probabilities and optimise the ship's course, speed, emission state and sensor settings for both individual assets and an entire task group.

Removing the fog of conflict will also play a major role in reducing

the probability of detection. One example has been integrating intelligence data with track correlation functions. For instance, when multiple sensors detect a potential threat it is automatically identified as a hostile fighter with a known specific search radar and weapons. The CMS automatically initiates a response ranging from electronic countermeasures to long-range engagement to neutralise the adversary before it can become a threat. Currently Saab is developing an extension of this response capability to Force Level Coordination of force assets across all warfare domains. This includes Force Planning, Intelligence, Task Group C2 and Force Operations.

Integration of unmanned systems is also a high priority for CMS development. Unmanned systems can dramatically extend the sensor and weapon footprint of a warship and offer great tactical advantage in littoral operations. New generations of air, surface and subsurface

unmanned vehicles are appearing which all require integration with the CMS to optimise the display and utilisation of their valuable data in a way that is seamless to the command team. Increasing levels of autonomy through artificial intelligence drive similar challenges for the CMS in fully understanding the likely behaviour or response of any unmanned system to the tactical situation.

The next generation of warships and their combat systems will see even greater advances in utilisation of high bandwidth networking such that the CMS will be a node within that network. This will revolutionise interoperability and the exchange of tactical data and communications in general.

Saab Australia continues to work closely with the Royal Australian Navy and the Defence Science and Technology Group, its supply chain and academic partners to explore and further develop these and other capabilities to meet the rapidly evolving threats in naval warfare.



OBSERVATIONS WORKING WITH SMEs

By **Mark Purcell AM**



AUSTRALIAN SOVEREIGN INDUSTRIAL CAPABILITY

The 2018 Defence Industrial Capability Plan signalled a new era in the engagement between Defence and Industry, with increased engagement not only with large companies, but also with small to medium enterprises (SMEs). Since that time, a shift in the engagement with Australian Industry has been quite visible, with a real focus on Australian content, technology transfer as well as industry development – all of which have proven to be prudent given the current environment we find ourselves in with travel and workspace distancing restrictions.

In this article, I would like to discuss some personal perspectives after having worked in the Defence delivery groups of CASG and CIOG, and now having spent time in Industry working with both large and small organisations which are seeking engagement on Defence programs.

In particular, my perspectives will cover the cultural differences in project controls between European primes and Australian requirements; provision of services vs products for Defence; SME engagements with primes and industry associations; the Maritime Environmental Working Group (MEWG); opportunities for improved collaboration between Defence and Industry through the sharing of key concept documents during the needs phase; improving future procurement visibility through AusTender; and some recommendations as to how these areas could be improved.

There is no doubt that the 2017 Naval Shipbuilding Plan, Plan Galileo and the subsequent 2020 Force Structure Plan have created a massive demand to grow the Australian Maritime sector, laying the foundations for a prosperous next century. As a result, there is an opportunity for Australian Industry to engage in this sector and become part of the national endeavour. In order to achieve this, collaboration between Defence and Industry is imperative.

PROJECT CONTROLS AND CULTURAL DIFFERENCES WITH EUROPE

Project controls and some of the metrics of project success include elements such as cost and schedule performance, delivery on budget and on schedule, and the delivery of the required capability. These have been the subject of multiple reviews over many years and go to the heart of transparency in the planning and delivery of Defence capability.

For complex capability projects, the controls used in CASG projects revolve

around Earned Value Management (EVM) and the Australian Standard AS 4817:2019 which is based on the International Standard ISO 21508:2018. Now, before you nod off to sleep, there is an important point to be made in the context of the programs being delivered in Australia which goes to a cultural difference between how projects are delivered in Australia and Europe.

EVM has its genesis in the US Department of Defense and while the Australian programs are working to the US DoD and International Standard, outside of the US and Australia, the formality of EVM is rarely adopted to the same scale. For example, a typical US/AU frigate construction program may have a Contract Master Schedule with 40,000 individual line items, while a similar frigate construction program in Europe may have a contract master schedule with just 600 line items.

Both types of programs have demonstrated success in delivering ships on budget and on schedule, but they are different approaches. So, imagine if you will that you have a European shipbuilder working to Australian requirements in an Australian shipyard with an Australian supply chain – the difference in approach may not be fully appreciated and could become an underlying cause of tension.

SME ENGAGEMENT PRODUCTS VS SERVICES

SMEs in Australia deliver a range of products and services and it is no different in the Defence sector. A range of supporting activities from organisations such as the Centre for Defence Industry Capability (CDIC) are good at assisting Australian businesses

in becoming 'Defence-ready' and helping them build the networks required to win work on Defence programs. However, I propose that the Next Generation Technologies Fund and the Defence Innovation Hub could gain greater relevance across the Australian supply chain if, in addition to the traditional base of product suppliers, they were more inclusive of Australian service providers.

In light of COVID restrictions, traditional engagement through trade shows is now severely limited. While the delivery of online industry development is improving, some method of engagement is still required to market yourself and your capabilities to Defence and the prime contractors.

These prime contractors should also have a similar consideration with the advertising and awarding of work packages through their own portals and those such as the Industry Capability Network. When accessing the opportunities on the relevant industry portals, I see limited opportunities for professional services, yet they remain an essential component of any capability delivery program. With engagement through trade shows now limited, some prime contractors are doing well in remaining engaged with the industry base, while others are limited in their ongoing engagement.

MARITIME ENVIRONMENTAL WORKING GROUP (MEWG)

The reimagined MEWG got off to great promise in 2020, with the stand-up of the new Navy Industry Engagement Strategy. It goes without saying that it has been a year of exceedingly high Op Tempo which I suspect has constrained the ability for the MEWG to engage, but demand remains high for details on current and future programs and how Industry can get engaged. Now is a great opportunity for a COVID-safe MEWG to host online seminars and workshops to explore where Defence

and Industry need to work together into the future, particularly given the reset outlined in the 2020 Force Structure Update.

Some potential workshop areas that the future MEWG could support include:

- Operational concept industry collaboration; Pacific support vessel, multi-role sealift and replenishment ships, mine countermeasures and hydrographic survey vessels, and
- Logistic support concept industry collaboration; Arafura class, Hunter class and Attack class.

CONCLUSION & INDUSTRY COLLABORATION SUGGESTIONS

Now is an exciting time to be involved in the Maritime Defence sector. The Government has set a clear demand signal for the volume, scale and complexity of future capability programs, as well as the intention to utilise Australian Industry to deliver and support this capability over the long term.

Collaboration is essential for Defence and Industry to be jointly successful in this national endeavour and this collaboration is underpinned by the 2019 Navy Industry Engagement Strategy.

Some suggestions for greater Defence and Industry collaboration include:

1. Establish the MEWG in a COVID-safe online forum including workshops and seminars.
2. Collaboration between Defence, Navy and Industry (Defence could release documentation as 'draft subject to change')
 - a. Operational concept (Pacific support vessel, multi-role sealift and replenishment ships, mine countermeasures and hydrographic survey vessels)
 - b. Logistic support concept (Arafura class, Hunter class, Attack class).
3. Defence Annual Procurement Plan – foreshadow 2020 Force Structure Plan projects' Approach to Market (ATM) activities.

4. Prime contractor COVID-safe Industry collaboration – products and services.
5. Project controls (cost and schedule – Earned Value Management)
 - a. EU primes have culturally different approaches to project controls
 - b. Australian and CASG requirements are inherited and enhanced from US DoD
 - c. Australian SMEs available to link between EU and Australian programs.

ABOUT MARK PURCELL AM

A former Rear Admiral in the Royal Australian Navy, Mark Purcell AM, specialised in Naval Engineering and Information and Communications Technology. Mark's last appointment in Defence was as the Head of Maritime Systems in the Capability Acquisition and Sustainment Group.

Mark has also held senior executive and project management positions within the Defence Materiel Organisation and the United Kingdom Defence Equipment and Support. As the Head of the Rizzo Reform program, Mark re-invigorated Navy's engineering and maintenance practices. He also served as the Head of Navy Engineering and the Chief Architect and the Director General of Sourcing Reform, in the Chief Information Officer Group.

Since his separation from Defence in 2016, Mark has worked as an independent contractor undertaking a number of ICT and Engineering consultancy roles in Australia and New Zealand. During this time, Mark began working as a Defence Specialist for TBH (Tracey Brunstrom & Hammond), an Australian project delivery consultancy with over 55 years' experience delivering defence projects. To find out more about TBH, please visit tbhconsultancy.com. ■



EM SOLUTIONS DISCUSSES SEA CHANGE IN DEFENCE INDUSTRY POLICY



Interview with **Rowan Gilmore,** **CEO, EM Solutions**

The Australian Navy announced its Navy Industry Engagement Strategy in 2019. How is that working for you so far?

The Chief of Navy's vision through the Navy Industry Engagement Strategy is for Navy, industry and academia to become trusted partners with deep transformational relationships so they can seize an unprecedented opportunity to contribute to nation building. The goal is for all stakeholders to build a maritime capability that can underpin the long-term security and prosperity of Australia and our region.

It's a real encouragement to Australian industry. EM Solutions' engagement with the Navy began in 2014 with a Capability and Technology Demonstrator (CTD) project that resulted in the first Cobra tri-band maritime satellite communications terminal trials on the Cape class patrol boat. Six years later we have a growing installed base and are collaborating even more closely through a new

Defence Innovation Hub project, to develop a future maritime satellite communications terminal that far surpasses any existing capability.

By working collaboratively with the Navy we have better understood their requirements and been able to include numerous innovations that will future-proof communications in its fleet. Through this, the Navy will achieve exceptionally resilient and fast communications from a sovereign supplier, and EM Solutions has benefited by developing and fielding leading-edge technology that is globally competitive.

What has EM Solutions achieved in the past few years?

Following Navy's sponsorship of the Cobra terminal certification for access to the Wideband Global Satellite (WGS) network, the Cobra system has been installed on both the Border Force's and RAN's Cape class vessels, the RAN's two new Auxiliary Oiler Replenishment supply class ships, the Anzac frigates, and in 2019 it was announced that this system will be installed in the Arafura class offshore patrol vessel. We have just completed factory acceptance testing of these first three ship sets.

How has this resulted in improved sovereign capability?

EM Solutions design, develop, manufacture and support our terminals entirely from our Brisbane factory. Customers buy our terminals because we achieve operability across multiple frequency bands and certification on multiple satellite systems, which offers resilience and higher communications availability. We are the only terminal manufacturer that designs and builds its own antennas and feeds, RF components, transmitters and receivers on a specially developed stabilised platform, and then assembles, integrates

and tests the entire satellite shipboard system – including the power systems, modems, terminals and switches.

This sovereign, vertically integrated IP enables us to adapt our system to quickly meet specific customer needs. We are then able to provide full through-life support and sustainment.

The JP9102 program will provide a new Australian Defence Satellite Communications System as part of a \$7 billion investment in sovereign space communications capability, and we envision our terminal segment will fit perfectly into a future where all elements of satellite communications can be under sovereign control and offer common sparing and support right across the ADF.

What export success have you had?

EM Solutions has historically derived approximately 60% of its revenue from exports, and this success still continues. In our earlier years we delivered on-the-move land terminals to the Spanish Army and to Japan, and RF systems to customers in the US and Europe, but our exports really accelerated after the Australian Navy adopted our Cobra terminals and sponsored their WGS certification. In early 2020, we received our largest ever export orders from three European NATO navies and a Middle-Eastern navy, and this in turn is generating intense interest from other allies. There is no doubt that support in our home market has proven a boost to exports.

EM Solutions and the Royal Australian Navy are a great example of industry and Navy working together for the long-term security and prosperity of Australia.



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CURRENT AND FUTURE NAVY CAPABILITY



Together with the current National Naval Shipbuilding Plan, the 2020 Defence Strategic Update (DSU) and 2020 Force Structure Plan (FSP) released in July will oversee a planned capability investment in Australia's maritime capabilities of approximately \$75 billion over the next decade.

DSU AND FSP

The DSU advises Australia's strategic environment has deteriorated more rapidly than forecast by the 2016 White Paper and notes the Indo-Pacific region is in the midst of the most consequential strategic realignment since the Second World War.

The document calls for strengthening of engagements while deepening the already close alliance with the US, but directs Australia must also be capable of projecting military power and deterring actions against it. The update therefore provides three new strategic objectives: to shape Australia's environment, deter actions against Australia's interests and respond with credible military force.

The plan reaffirms the government's commitment to 12 regionally superior Attack Class submarines, nine anti-submarine warfare-optimised Hunter Class frigates and 12 Arafura Class OPVs. In addition, it forecasts acquisition of capabilities such as maritime strike and advanced surface to air weapons systems, including long-range anti-ship and land strike weapons, advanced lightweight and heavyweight torpedoes and participation in directed energy weapon development.

From a shipbuilding standpoint,

The RAN is undergoing its largest expansion since the Second World War, thanks to the government's National Naval Shipbuilding Plan which will deliver new patrol vessels, surface combatants and submarines over the next three decades. To find out more about proposed enhancements to Navy capability, **Nigel Pittaway** recently spoke with Head Navy Capability, Rear Admiral Pete Quinn.

Navy has recently taken delivery of its third, and last, Hobart Class destroyer and replacements for its Armidale Class patrol boats, Anzac Class frigates and Collins Class submarines are now either in their design or construction phases.

In addition, two large underway replenishment vessels, built in Spain but completed in Australia, will join the fleet in the next 18 months to replace Navy's fleet oiler, HMAS *Sirius* and the now decommissioned Auxiliary Oiler Replenishment vessel, HMAS *Supply*.

it forecasts local construction of a replacement for Navy's Hobart Class destroyers on completion of the Hunter build program; design and construction of two multi-role sealift and replenishment vessels to replace the Landing Ship Dock, HMAS *Choules*; life extension of Australian Defence Vessel Ocean Protector, acquisition of an ice-rated replacement vessel; and enhancements to Navy's mine countermeasures and tactical hydrographic capabilities through acquisition of up to eight locally built ships, potentially based on the Arafura Class OPV.

FUTURE NAVY CAPABILITY

The FSP notes this expanded future maritime force will provide "greater capability for ASW, sealift, border security operations, maritime patrol and reconnaissance, air warfare, area denial, sea control and undersea warfare".

To find out more about proposed enhancements to Navy capability, including the upgrade of the Collins Class submarine until it is replaced by the new Attack Class boats in the next decade, Navy *OUTLOOK* recently spoke with Head Navy Capability, Rear Admiral Pete Quinn.

"The FSP is a deliberate exercise undertaken every four years that conducts a holistic review and evaluation of everything Defence has planned. FSP reaffirmed that the key elements of future Navy outlined in the 2016 Defence White Paper remained sound and fit for purpose for the changing strategic environment, including the transition from the Collins Class to Attack Class submarines, the Anzac Class frigates to the Hunter Class ships and Arafura Class OPVs replacing the Armidale Class patrol boats," RADM Quinn says.

"The continuous naval shipbuilding program is foundational and it is

understandably the subject of a lot of attention, but for me the key for Navy's future will be how we continuously evolve our sensors, weapons and combat systems, remote and autonomous systems, and our cyber, electronic warfare and communications systems, to keep pace with an increasingly demanding operational environment.

"These are the things we've been doing a lot of work on and there are several key proposals Navy will be taking through the approvals process over the next couple of years, that will lay out our roadmaps and capability plans for these areas."

An example will be the transition from the current Raytheon SM-2 medium-range surface to air missile, to the SM-2 Block 3C weapon, which features active terminal homing; and the planned acquisition of SM-6, which can provide terminal defence against ballistic missiles, a long-range anti-ship capability and extended range air and missile defence.

"We have a significant focus on increasing our offensive lethality. We have some excellent defensive systems – such as Nulka missile decoys, RIM-162 Evolved Sea Sparrow Missile and SM-2, but we are concentrating on long-range offensive strike capability, in accordance with the deter and respond objectives of DSU," RADM Quinn adds.

"What we are doing for guided weapons is transitioning from individual projects into a long-term maritime guided weapons program, via which we will obtain program-level approvals for enhancements of Navy's surface, above water and undersea combat capabilities. Obtaining approval for this new program approach is a near-term objective."

One of the key technologies highlighted in FSP is that of uninhabited and autonomous systems, and RADM Quinn highlights two



Rear Admiral Peter Quinn, Head of Navy Capability

programs. The first is Navy's Maritime Tactical Unmanned Aerial System (MTUAS) capability being delivered under SEA129 Phase 5 and the other is the future mine countermeasures and tactical hydrographic capability to be delivered under SEA1905.

"In the future we will see a much greater use of autonomous systems, particularly for roles such as mine warfare, hydrography, communications relay and electronic warfare. We will adopt a rolling development approach to autonomous technology because it is the only way we will be able to keep up with rapidly occurring advancements in those technologies and the threats they will be designed to counter. Strong, long-term industry collaboration will be essential," RADM Quinn says.

"We've already embarked on rolling the development approach for our combat systems and I expect you'll see a broader range of key Australian industry players in the tent with Navy, CASG and DST – to assist us in defining our future direction, then delivering future maritime capabilities in a much more integrated partnership arrangement than we've seen in the past. It really will need to be a 'Team Australia' effort." ■

RHEINMETALL OFFERS SOVEREIGN NAVAL WEAPON CAPABILITY FOR AUSTRALIA

Rheinmetall will manufacture and sustain its Millennium 35mm Gun in Queensland under its offer to the Commonwealth of Australia to deliver a single weapon system to meet current needs of the Royal Australian Navy fleet as well as future-proof against emerging self-defence and mission requirements.

While the Millennium Gun system – currently in service with nations including Indonesia and Denmark – is currently designed and manufactured in Switzerland, Rheinmetall has proposed to transfer technology from Europe to its new state-of-the-art manufacturing facility in Redbank, Queensland as part of its offer to the Commonwealth.

Millennium is a highly flexible and powerful weapon that is unique in its capability for effective self-defence against threats to own ship at close range. In particular, the ability to engage a broad spectrum of air and surface threats from high speed Anti-Ship Missiles to UAVs, fighters, rotary wing aircraft as well as small, highly manoeuvrable fast inshore attack craft.

A proven 'multi-tool' like the Millennium will significantly aid in the survivability of the platform in any multi-threat scenario. Millennium's accuracy and high rate of fire delivers superior fire power, lethality and cost-per-kill ratio compared to others in the 20-40mm calibre bracket, with a significant range advantage over in-service 20mm CIWS or 30mm based surface effectors and at comparable ranges to any 40mm system.

Rheinmetall's new facility in Queensland is the cornerstone of the company's commitment to building Australian Industry Capability (AIC) and is designed to produce military hardware for the Australian Defence Force and for export. Also known as the



Military Vehicle Centre of Excellence, the facility is purpose-built for design manufacturing with test infrastructure including an EMC chamber, small calibre (up to 35mm) firing tunnel and prototyping workshop.

Capability across the new precinct runs from heavy manufacturing to a clean room for Rheinmetall's Electronics Division as well as a sophisticated armour manufacturing shop, featuring a state-of-the-art press that will produce an array of composite ballistic materials; in short, a self-protection production capability for ballistic protection for ships and vehicles.

Millennium's unique AHEAD air burst ammunition will also be produced in Australia, delivering critical sovereign capacity. Precise programming for each individual AHEAD round maximises hit probability and energy on target at extended ranges to enforce a keep-out zone around a vessel. AHEAD sub-projectiles also have a significant destructive effect on electro-optic sensors, which provides for a tertiary

Anti-Submarine Warfare capability for Millennium, particularly when submarine optronic mast exposure is likely to be high when operating in littoral waters.

Integrated with a number of combat systems and associated radar and electro-optic sensors, Millennium is proven and in service at sea today. The 35mm Millennium Gun requires no deck penetration. It offers a range of versatile mounting options including the 'containerised' ISO Mount option, which allows deployment of Millennium as a mission module on almost any class of ship without any major structural alterations.

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AEGIS AT SEA: HOBART CLASS AIR WARFARE DESTROYERS

The third and last Hobart Class DDG to be constructed in South Australia for the RAN, HMAS *Sydney*, was commissioned on 18 May 2020 and is now undergoing a period of test and evaluation which will ensure her crew's proficiency in the operation of the cutting-edge Aegis combat system.

Based on Navantia's F-100 design in service with the Spanish Navy as the Álvaro de Bazán Class, the 7,000-tonne Hobart Class ships are optimised for air defence but also have a range of advanced capabilities, including anti-submarine warfare (ASW) capability. In this regard they are, and will remain, Navy's most capable surface asset, until the introduction of the Hunter Class ASW frigates in the early 2030s.

At the heart of the ship's design is the Lockheed Martin Aegis combat system and AN/SPY-1D(v) phased array radar system which, together with Raytheon

Technologies' SM-2 missile system, provides Navy with an advanced air defence system, capable of protecting a surface task group out to ranges in excess of 100km.

All three ships were built at Osborne in South Australia by the Air Warfare Destroyer Alliance under Project SEA4000. The lead ship HMAS *Hobart* (D39) was launched in May 2015 and commissioned in September 2017, followed by the second vessel, HMAS *Brisbane* (D41), which was commissioned in October 2018, and finally HMAS *Sydney* (D42) in May 2020.

Head Navy Capability, RADM Quinn says the Hobart Class will form the core of air defence capability for Navy as it continues the transition to integrated maritime task group operations.

"Navy commissioned HMAS *Sydney* at sea off the coast of New South Wales, which is something we haven't done since the Second World War. We did that in the light of the COVID-19 restrictions, and it shows that, in spite of a global pandemic, Navy remains ready to deploy maritime capability whenever required by Government," RADM Quinn says.

"The ship was delivered earlier in the year and the finish of it is superb, the number of deficiencies was tiny in comparison to early in the program, which shows how Australia's shipbuilding capability has rapidly matured over the past few years."

Before *Sydney* was delivered, the modifications required to operate the Sikorsky MH-60R Seahawk maritime combat helicopter were incorporated. These modifications, including changes

to the ship's flight deck, hangar, magazine and external lighting systems, had been incorporated into HMAS *Hobart* and HMAS *Brisbane* in a retrofit process after delivery.

"We took the opportunity to use the skilled-up workforce in Osborne to incorporate those changes, which has helped us to advance when the ship will be fully functional," RADM Quinn adds.

Both of the earlier ships have enjoyed a busy operational period over the last 12 months, with HMAS *Brisbane* deploying to San Diego to perform her combat systems sea qualification trials, which proved the functionality of the Aegis combat system, and *Hobart* conducting a successful deployment to Asia.

More recently, HMAS *Hobart* joined a group of Navy warships in July on a deployment for exercises in South East Asia, before sailing to Hawaii, where they will take part in the US Navy-led Rim of the Pacific (RIMPAC) multi-lateral exercise.

"It will be quite a lengthy deployment and it is the intent that they will be at sea for almost all the time they are away," RADM Quinn explains. "They will conduct at-sea, self-sustaining operations, both within Task Group resources and with allied replenishment vessels. The Task Group is demonstrating that the impacts of COVID-19 will not stop Navy from continuing to deploy into the region and collaborate with our allies and friends as a stabilising regional presence" RADM Quinn explains.

The DDG capability is now fully integrated into Navy's surface fleet and is a key component of the task group capability. Final Operational Capability (FOC) is expected to occur in 2021, once *Sydney* has completed her own deployment to San Diego to qualify her combat systems.

"All in all, we have a great capability with the destroyers in the fleet now and the advantages they bring; in particular,



the Aegis combat system has been quite a step-change in Navy's operation of those high-end units," RADM Quinn explains.

"There is a lot of pre-planning you need to do before you go to sea, to make sure your systems and people are ready, and the right information and intelligence is available to complete the mission successfully. In the future we will continue to see big changes in Navy, as we develop increased maritime and land strike capabilities, in addition to extended air and missile defence and [with the future introduction of the Hunter Class frigates] an all-Aegis surface combatant fleet.

"We will learn a lot of lessons over the next few years which will set us up very well as we transition to a 12-ship Aegis fleet, which will also be the largest Aegis fleet outside the US Navy, when we introduce the Hunter Class frigates."

Looking to the future, the *Hobart* Class Aegis combat system will be upgraded to the latest Baseline 9 configuration, which is the same capability as the Hunter Class frigates and is also the version now being rolled

out to the US Navy.

"The work we do to implement the [Saab Australia] Australian interface in the *Hobart* Class will effectively be the same work we'll be doing in the *Hunter*," RADM Quinn adds. "We're going to take an integrated combat system approach across the both Classes."

RADM Quinn points out the DDG's capabilities should not be considered in isolation, but in the context of other high-end capabilities now being introduced into Australian Defence Force (ADF) service. "Other key joint force maritime capabilities will include Air Force's F-35A, which will achieve Initial Operational Capability (IOC) this year, the Wedgetail airborne early warning and control platform, Poseidon, Growlers and other capabilities in the future," RADM Quinn adds.

"The *Hobart* Class is Navy's key component in developing the connected future force, where the integration of maritime platforms, sensors and weapons will see the ADF evolve into a truly fifth generation defence force." ■

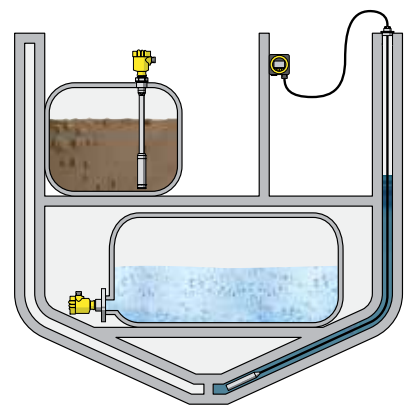


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HUNTER CLASS FRIGATES: NAVY'S SILENT KILLERS

The nine Hunter Class frigates being acquired under SEA5000 will represent a step-change in anti-submarine warfare capability (ASW) in the Indo-Pacific region when they begin entering service early next decade.

The ship is designed to be ultra-quiet when it is hunting submarines, but more than that, the Hunter Class frigates will also be delivered with a world-leading air defence capability, thanks to the combination of an advanced CEAFAR2 phased array radar, developed by Australia's CEA Technologies, Lockheed Martin's Aegis Baseline 9 combat system and an Australian interface developed by Saab Australia.

The Hunter is based on BAE Systems' Global Combat Ship design, which also forms the basis for the UK's Type 26 now under construction, and it was the Royal Navy's requirement for a high-end ASW replacement for its Type 23 frigates – regarded by some as the quietest ASW ships in the world today – which drove the need to be stealthy.

The Australian ships will be built in three batches of three vessels by ASC Shipbuilding at Osborne in South Australia, with prototype hull



block manufacture scheduled to begin in December. Steel for the first ship is expected to be cut in December 2022 and the program is currently on track for it to be delivered at the end of the 2020s.

"The development of the ship is going well, but it is a challenging project," says Head Navy Capability, RADM Quinn. "The first Type 26 for the UK won't be launched until 2021 and we're seeking to incorporate changes to the reference design, with the CEA radar, Aegis Combat System, Saab Australian interface, the MH-60R maritime combat helicopter and different weapons, to meet the demanding requirements of Australia's operating environment.

"We're also doing it to a tight schedule. We're learning a lot and there's a lot of work to do to keep it on track, but we are on schedule to begin those prototyping activities later this year."

The Hunter Class ships will be constructed in a purpose-built shipyard at Osborne which has recently been

completed; however, some of the final site acceptance tests of the complex shipyard machinery imported from Europe have been delayed by travel restrictions to Australia caused by the COVID-19 pandemic. However, these delays have been mitigated and all equipment will be operational by early October.

"We're also on track to commence the build of the first ship at the end of 2022. ASC Shipbuilding is growing its workforce for the program, but there is risk associated with the key skills sets that are difficult to find in Australia – complex project managers, naval architects for example – but excellent support is being provided by the Naval Shipbuilding College to help Australian industry incrementally grow those core skill sets," RADM Quinn says.

In October 2017, the federal government announced an enterprise approach to combat systems development and for major surface combatants – comprising Navy's current Hobart Class DDGs and Hunter

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- Royal Australian Navy's Hunter class frigates* ▪ Canadian Surface Combatant* ▪ Japanese Maritime Defense Force's 30FFM frigates
- Royal Navy's Type 26 Global Combat Ship and Queen Elizabeth class aircraft carriers ▪ Republic of Korea Navy's Daegu class frigates
- United States Navy DDG-1000 Zumwalt class destroyers and Littoral Combat Ship Freedom class variant ▪ Italian Navy's Landing Helicopter Dock

*Type 26 Global Combat Ship design selected for Australia and Canada



Class frigates – it is the Aegis/Australian interface combat system combination.

“That will form the basis of our enterprise approach to combat system development and we’re well advanced on forming those long-term partnerships with industry, and in particular with ASC Shipbuilding, Lockheed Martin Australia and Saab Australia, to be able to do that work,” RADM Quinn explains.

“That’s moving ahead well; there is a new branch within the Capability Acquisition and Sustainment Group known as the Combat Management Systems and Payload System Branch, and they are working very closely with Navy and industry.”

A further feature of the GCS design is a large mission bay, which is fitted with lifting equipment, electrical power and cooling systems to accommodate a range of capabilities, including future integration of modular and autonomous air, surface or undersea systems.

“Many of the mission packages we’re developing for the Mine Countermeasures and Military Survey

vessels under SEA1905 will also be able to be integrated within the Hunter Class mission bay,” RADM Quinn adds. “Hunter is very well designed to accept different modular systems.”

Because Navy has adopted the batch build approach to the Hunter Class, as technology advances and lessons are learned, the ships’ capability will evolve over the life of the construction program.

“As we add capabilities we will also be concentrating on the maintenance of the material margins of the design – the weight margins, electrical power and cooling systems and the like – to support future weapons capabilities like directed energy weapons, additional robotic and autonomous systems, and new weapons we may employ from the Mk.41 Vertical Launch System,” RADM Quinn details.

“Some platform changes will occur as the batches are built. We intend to lock down a number of improvements or technology inserts for each batch, incorporate those changes and begin the process again for the next batch.”

Beyond the nine Hunter Class ships delivered under SEA5000, the 2020

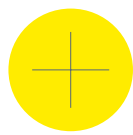
Defence Force Structure Plan released in July forecasts that \$75 billion will be spent on maritime capability in the next 10 years, and up to \$2.4 billion will be spent in the 2030s on the design of a future destroyer to replace the Hobart Class DDGs. The FSP predicts the new ships will be built following the completion of the Hunter build program, to sustain Navy’s air warfare capability while continuing the national naval shipbuilding program.

“There will be a decision on whether the Hobart replacement is a derivative of the Hunter Class or a new design, but that decision likely won’t be made until well into the 2020s or perhaps the early 2030s,” RADM Quinn says.

DESIGNING AND BUILDING THE HUNTER

From an industry standpoint, ASC Shipbuilding Managing Director Craig Lockhart says that after the completion of the new shipyard at Osborne and the process to build a skilled workforce, the next phase is to enable the supply chain to support the build.

“That’s going well; we’ve let the first contract to Blue-Scope Steel



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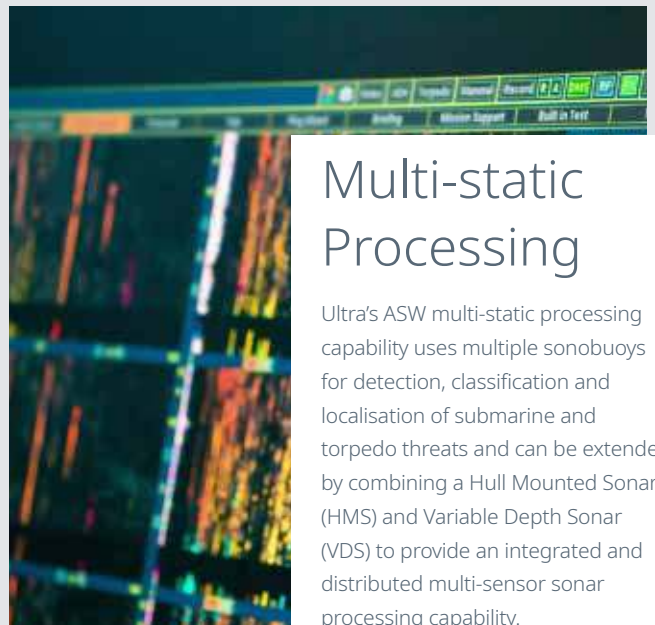


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recently and we're on target to deliver everything we set out to do in mobilising that supply chain. If we deliver on everything that's in the pipeline at the moment, measured across materials and labour, we'll be in excess of 90% Australian Industry Content (AIC) across prototyping alone," Lockhart says.

"I have huge confidence in the Australian supply chain, and we are seeing great engagement from the small to medium enterprise (SME) community in terms of their involvement in the Hunter program. They're basically handling everything we're throwing at them at the moment."

The prototyping work will see the construction of five hull blocks at Osborne, with the first two being the UK Type 26 design as constructed by BAE Systems in Glasgow, allowing ASC Shipbuilding to start with known design entities. The other three will be Hunter blocks of increasing complexity and the concept is to prove and certify the workforce, shipyard and work processes ahead of steel being cut on the first ship in December 2022.

The Hunter design program is continuing in parallel with preparations for construction and Lockhart says ASC Shipbuilding is working closely with Navy, CASG and key industry partners such as CEA Technologies, Lockheed Martin and Saab. This initial work is due to conclude with a Systems Definition Requirements Review in March 2021, where the mission systems specifications will be agreed and set.

"That will allow us to release into the Preliminary Design Review (PDR) and progressing with spatial design, really looking into the details of how we bring this ship together. An example of this from a design perspective is the mast, in terms of establishing the capability requirements, which means we consider everything from power



distribution to cooling systems and how that works from a whole-of-ship perspective," Lockhart details.

"We're into the depths of agreeing upon all of the key decision points in the combat management systems line, which is on the critical path, as well as getting all the early ASW requirements agreed with partners such as Thales and Ultra Electronics. We're working to clarify US Foreign Military Sales (FMS) requirements around the Aegis system and then integrating the agreed requirements against the whole-of-ship considerations."

Because the Australia-specific changes differ in size, power, cooling requirements and weight to the GCS reference design, the need to remain within the material design margins of the Hunter design is of critical importance to retaining the performance characteristics of the ship.

"My role is to make sure this all comes together and that the ship is fit for purpose and she absolutely meets the performance criteria that we set out at the start, in terms of speed, range, durability, interoperability, damage control, seakeeping and all of those things – and there's nothing at the moment to challenge those design marks," Lockhart adds.

"I am comfortable that, with the design changes we are working through with the customer, we have more than enough design margin to be able to do that. The Hunter Class frigate will at least be the equal of, if not better than, the reference design. The CEA radar capability is world-Class, Aegis is a well-proven plug and play capability and as far as ASW is concerned, the platform is equal to that of the UK's Type 26. It is a very capable platform." ■



GUARDING AUSTRALIA'S NORTH: ARAFURA OPVs

Some of the first ships to be delivered under the federal government's continuous naval shipbuilding plan are 12 Arafura Class Offshore Patrol Vessels (OPVs), now under construction in South Australia and Western Australia.

The Arafura OPVs are being acquired under the \$3.6 billion Project SEA1180 Phase 1 and will replace Navy's ageing Armidale Class patrol boats (ACPBs) and Cape Class patrol vessels from 2021, with primary roles of border surveillance and protection of Australia's northern approaches.

In November 2017, Luerssen was announced the winner of the SEA1180 tender process with a 1,640-tonne vessel based on its OPV80 design, similar to the Darussalam Class patrol vessels recently constructed for the Royal Brunei Navy.

The Navy's new OPVs will represent a significant increase in capability over the older Armidale ACPBs, including

the Saab Australia 9LV combat system, a helicopter flight deck and the ability to embark and operate Unmanned Aerial Systems (UASs). The 80-metre vessels will be capable of speeds up to 20 knots and will have a range of over 4,000 nautical miles (7,400km). The main armament is an OTO Marlin 40 (40mm) gun.

The prime contractor is Luerssen Australia in partnership with shipbuilders ASC in South Australia and Cvmec in Western Australia. The first two vessels, HMAS *Arafura* (OPV1) and HMAS *Eyre* (OPV2), are currently under construction at Osborne by ASC, and construction of the third vessel, HMAS *Pilbara* (OPV3), has now begun at Cvmec's facility at Henderson. All subsequent ships will be



built in Western Australia by Cvmec.

Speaking at a ceremony in Perth to acknowledge Luerssen Australia's 100 small to medium enterprise (SME) suppliers in January, the company's CEO Jens Nielson noted that when it signed the SEA1180 contract on 31 January 2018, Luerssen Australia committed to an Australian Industry Capability (AIC) of 60%. "Today the company has achieved 62.7% but it will not stop us from continuing to achieve more," he said.

Construction of OPV1 began in November 2018 and a keel laying ceremony was conducted at Osborne in May 2019, followed by the joining of the two halves of the vessel in May 2020. Construction of OPV2 began at Osborne in June 2019 and the first steel was cut on OPV3 at Henderson at the end of March.

"We now have two vessels under construction in South Australia and they are on track. Earlier this year we commenced construction of the third ship in Western Australia, at the new

Cvmec shipbuilding hall at Henderson, which is one of the largest of its kind in the southern hemisphere, and that ship is also on track," explains Head Navy Capability, RADM Quinn.

"We haven't seen a significant impact on their construction throughout the COVID-19 pandemic to date, because right from the very beginning Luerssen, ASC and Cvmec immediately put into place some very sensible social distancing measures, which has enabled them to hit their milestones on schedule. We are seeing some impact on our global supply chain for these vessels, but this is being well managed by the industry team."

The OPVs are being built to a tight drumbeat, which has precluded a batch approach to design and all 12 will be delivered to Navy in basically the same configuration. "The 12 Arafura Class OPVs will all effectively be the same, other than the regular system updates we will undertake over the next decade to the ships' combat and communications systems, and any work that might be done to continue to improve AIC," RADM Quinn explains.

One of the key strategies announced in the Defence Strategic Update and 2020 Force Structure Plan in early July was the acquisition of up to eight vessels for mine countermeasures and tactical hydrographic operations, which will be built in Australia and potentially based on the Arafura OPV design. The additional vessels will be capable of accepting role-specific modules, which will allow operational flexibility while based on a single hull design.

"If design work is successful, we intend to build the Maritime Mine Countermeasures and Military Survey vessels in parallel with the Arafura Class OPVs," RADM Quinn explains.

If approved by Government, the new strategy will replace Navy's current Maritime Mine Countermeasures (SEA1905) and Hydrographic Data Collection Capability (SEA2400) projects

under a combined program, which is likely to retain the SEA1905 title. The new program is valued up to \$5 billion and will run between now and 2035, to replace the Navy's current Huon Class Minehunter Coastal (MHC), Leeuwin Class Hydrographic Survey Vessels (AGS) and Survey Motor Launches (SML).

"In essence we will be proposing to Government that we take a new approach, which will join the mine warfare and the military survey component of the hydrographic tasks together in a single project," RADM Quinn details. "It will focus on the use of robotic and autonomous systems, combined together into a 'toolbox' of capabilities."

Under the concept, each of the modular role-specific systems – and their operating specialists – can be regarded as a mission 'brick', allowing the individual capability to be operated from one of the multi-role Mine Countermeasures and Military Survey vessels or other Navy ships such as the Hunter Class frigates – which will feature a large mission bay – and even ashore.

"The Mine Countermeasures and Military Survey vessels, like the Arafura's, are being designed to be multi-role vessels that can take different containerised systems to perform a range of different roles. We're intending to build very flexible platforms," RADM Quinn says.

A further advantage of this modular strategy using a single hull design is that it will reduce the number of ship Classes operated by Navy across the patrol vessel, mine countermeasures and hydrographic roles from five down to potentially just one, with the benefit of somewhat simplifying future fleet commonality, training and sustainment.

Studies into the suitability of the basic Arafura design to be adapted for the new roles are ongoing and RADM Quinn says he anticipates a decision on whether or not to proceed by the end of the year. ■

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MAINTAINING REGIONAL SUPERIORITY: COLLINS UPGRADE

According to the current schedule, the first of Navy's 12 new Attack Class submarines will be delivered in the early 2030s and, until then, the existing Collins Class boats will need to maintain a capability edge across the region.

This will mean that at least five, and possibly all six, Collins Class submarines will undergo a life extension activity from 2026, but Head Navy Capability, RADM Quinn says the fleet is currently performing extremely well and has come a long way since it was a Project of Concern. He says the turnaround in availability of the fleet has largely been due to the implementation of a range of recommendations from the Coles Review, which began in 2012 and resulted in the removal of Collins from the Projects of Concern list in 2016.

"The Collins Class has really hit its

straps over the last three years or so, as the full Coles Review reforms were implemented. Indeed, for the last couple of years the Collins Class has consistently exceeded our benchmark availability and they are deploying consistently into the region – it is a huge change from five years ago," RADM Quinn explains.

"That increased availability we're getting from the new usage upkeep cycle as a result of the reforms we've undertaken in partnership with ASC and others, has allowed us to support the building of our workforce."

RADM Quinn says Navy's submarine workforce is now slightly ahead of its planned numbers and is on a trajectory to over 950 submariners by 2025, to begin transition to the Attack Class.

"We've come from around 400 submariners five years ago to over 800 today, which is really an excellent capability increase," he adds.

From a capability standpoint the Collins fleet is currently going through a major docking cycle, which will upgrade the submarine's sonar and communications systems, in conjunction with combat system and Mk.48 Advanced Capability (ADCAP) heavyweight torpedo spiral

development programs.

"The first boats are now being fitted with their new sonar system, so all the 'wet end' components are being replaced and we're performing a full communications upgrade and they're all going well," RADM Quinn explains.

"We're also continuing with the evolution of key systems through our co-operative program with the US Navy. Last year we entered into a new memorandum of understanding (MOU), which extends collaboration on the combat system and Mk.48 torpedo for another 15 years."

Five, and possibly six, of the Collins submarines will undergo an additional full cycle docking activity which will also extend the life of each boat by a further 10 years and ensure transition to the Attack Class submarines is de-risked.

"We need to underpin the excellent capability we're getting from the submarine and we need to ensure it remains reliable and supportable for that additional 10-year period," RADM Quinn says.

"That will assure our ability to maintain our current impressive level of submarine availability as the Attack Class transitions into service." ■

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SUSTAINMENT AT SEA: SUPPLY CLASS REPLENISHMENT VESSELS



The first of two 19,500-tonne underway replenishment ships (AOR) for the Royal Australian Navy is due to arrive in Western Australian waters in September for completion and fit-out, following construction by Navantia in Spain.

The two vessels, to become HMAS *Supply* and HMAS *Stalwart*, will respectively replace Navy's current fleet oiler (AO) HMAS *Sirius* and the recently decommissioned support ship (AOR) HMAS *Success*, providing a step-change in capability for the surface fleet.

Based on the Spanish Navy's Cantabria

Class ships, the new vessels are being acquired under SEA1654 Phase 3, the contract for which was signed in May 2016. Both ships will be completed in Western Australia before joining the fleet in 2021 and 2022 respectively.

NUSHIP *Supply* was launched in Ferrol in November 2018, followed by NUSHIP *Stalwart* in August 2019. Although the arrival of the first vessel has been delayed by the restrictions imposed by COVID-19, Final Operational Capability (FOC) is planned to occur on schedule in 2022.

"We're expecting to see *Supply* delivered to Western Australia around September, which is a delay of a few months, and we'll be doing more of the production work in Australia than we'd planned to, including integration of some of the combat system and communications elements," explains Head Navy Capability RADM Quinn.

"She's tracking towards an Initial Operational Capability (IOC) in the latter

half of 2021, which will position us to be able to pay-off HMAS *Sirius*. But we're planning for contingencies and if *Sirius* needs to run on, we'll do the required maintenance to extend her."

RADM Quinn says the two new vessels will deliver capabilities the Navy has not enjoyed to the same level with its earlier replenishment ships.

"They have twin hangars, a large flight deck, they can carry munitions and vast quantities of stores and fuel, including aviation fuel," RADM Quinn says. "Because they are based on the Cantabria ships, they are well designed to operate with both the Navy's Hobart Class DDGs and Canberra Class LHDs, both of which are also based on Navantia designs, but also provide improved support to the Anzac Class FFHs. Due to their common design with the DDGs and LHDs, they will be part of an enlarged support system beyond either *Sirius* or *Success*."

As part of this step-change in capability, the new vessels will also be fitted with the Saab Australia 9LV combat system, in use in the Anzac Class frigates and LHDs. This will be common across all Navy surface vessels in the future, including the Hobart Class DDGs and the Hunter Class frigates, which will have a version of the Saab system as their Australian interface. The Supply Class ships will also have Rafael Typhoon 25mm weapons and the latest Phalanx Block 1B Baseline 2 Close in Weapons System (CIWS).

"They are well-equipped ships, in terms of capability, which is something we really haven't had in our tankers before, except perhaps for the short time we fitted *Success* with CIWS during the first Gulf War in 1990/1991," RADM Quinn adds. "This will be a much more integrated solution than we've ever had aboard a support ship [and], with a proper combat management system. We're eagerly anticipating bringing the *Supply* Class online." ■

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NAVY'S PATHWAY TO ENHANCED ROBOTIC AND AUTONOMOUS CAPABILITIES

One of the keynote areas for future investment highlighted in the recent *2020 Defence Strategic Update* is that of robotic and autonomous systems.

The document specified the greater use of such systems to ensure Australia has a “potent, networked force able to undertake a wide range of activities across huge distances”. It is also perhaps worth noting that almost every future major platform acquisition program will have some element of autonomy associated with it.

Navy is aiming to embrace the autonomous revolution, with major acquisition programs in the air,

surface and undersea domains already underway and it has a strong legacy of sponsoring trials and demonstrations, such as its rolling Autonomous Warrior program starting in October 2020 and linked to Navy exercises such as Kakadu and RIMPAC.

In the surface and undersea domains, Navy is conducting several projects which will harness the application of robotic and autonomous systems in day-to-day use. These include SEA1770 (Rapid Environmental Assessment), SEA1778 (Deployable Mine Countermeasures) and SEA1905 (Maritime Mine Countermeasures and Military Survey).

Under SEA1770, Navy has acquired Hydroid (BlueZone) Remus 100S Autonomous Underwater Vehicles (AUVs) for hydrographic charting quality, seabed search and mapping, and it has also acquired Slocum Glider AUVs for oceanographic observations for up to 60 days. The Slocum Gliders are currently operating north-east of Cairns in the Coral Sea and being remotely piloted by

Navy from Marine Tech Systems facilities in Perth.

Under SEA1778, Navy is acquiring General Dynamics Maritime Systems Bluefin-9 and larger Bluefin-12 AUVs, together with Steber International 11.6 metre support vessels – of which some will be configured as Unmanned Surface Vessels (USVs). Additional technologies being developed include the long-endurance Bluebottle USV, developed by Australia’s Ocius Technology.

“We’re introducing our first AUV and USVs into the fleet through SEA1770 and SEA1778 now,” Head Navy Capability, RADM Quinn explains. “And we’re sponsoring new technologies including multiple Ocius Bluebottle long-duration USVs to develop teaming technologies and concepts.”

RADM Quinn says Navy’s next major step into autonomous systems will be under SEA1905. “The heart of remote mine warfare is autonomous surface vessels, operating within mine danger areas towing, or launching or recovering other advanced systems such



as side-scan sonars, influence sweeps and AUVs. The autonomous surface vessels are likely to be fairly large units – we’re talking about 12-15 metre boats weighing up to 20 tonnes to deploy the sorts of capabilities we need,” he says.

In the medium term, Navy will lead the development of an integrated undersea surveillance system, to provide persistent undersea surveillance of our northern approaches and proximate sea lines of communications. When delivered, this will enable Defence to better detect, deter and respond to submarines and other undersea threats, as well as improve our contribution to regional anti-submarine warfare.

This project will augment existing and planned ADF forces through the delivery of an enhanced command and control system and dedicated undersea surveillance platforms and sensors. The makeup of these systems, platforms, sensors, support facilities and delivery schedule will be defined as the project is initiated and developed. Uncrewed systems (UxS) are expected to complement current and future

Classes of crewed platforms to improve the effectiveness, capacity and reach of missions in the undersea domain – the key challenge will be to mature these systems through research, development and experimentation. Navy plans to invest in these activities to identify and explore opportunities for enhanced undersea warfare, which will de-risk future projects.

Follow-on investment in appropriate UxS technologies linked to the undersea combat and surveillance mission will ensure Defence maintains a capability advantage in the undersea domain. The new capabilities will likely require organisational changes and new skill sets that will build on the knowledge base of submarine operations, wide area surveillance and operations of UxS across the Joint force.

As an activity primarily intended to de-risk and support the delivery of an integrated undersea surveillance system, Navy will work closely with Defence Science and Technology personnel on the Remote Undersea Surveillance STaR Shot (Science, Technology and Research

Shot). This STaR Shot will develop above and below water sensors, information processing, communication and data fusion systems for remote surveillance for undersea environments.

This activity aims to progressively demonstrate sensor technology, data science and distributed integration that can provide wide area undersea domain situation awareness.

Successive outcomes would see an increase in system complexity towards an autonomous surveillance network that can provide an agile, persistent and resilient wide area undersea operating picture that supports superior decision-making.

In the air domain, Navy already operates both fixed and rotary-wing unmanned systems, in the shape of Insitu Pacific’s ScanEagle and the Schiebel S-100 Camcopter, which are flown by 822X Squadron at HMAS Albatross.

The ScanEagle conducted First of Class Flight Trials (FOCFT) aboard the amphibious warship HMAS Choules in 2016 and deployed to the Middle East

for the first time aboard the guided missile frigate HMAS *Newcastle* the following year. Most recently, ScanEagle has been conducting trials over Jervis Bay, using hyperspectral imaging technology developed for a range of operations.

Both platforms are operated by 822X Sqn to inform future maritime AUV acquisition to be made under SEA129 Phase 5. Deployment of the rotary wing Camcopter has up until now been delayed by the development of a heavy fuel engine, but this work has now been completed and the S-100 system began FOCFT aboard the Anzac Class frigate HMAS *Ballarat* in mid-2020.

“We have developed a different strategy to deliver SEA129/5 but we hope to make a broader approach to industry in the second half of 2020, with the particular aim of gaining a better understanding of exactly what capabilities Australian industry is currently able to deliver,” RADM Quinn explains.

“We’re very keen to develop as much capability in Australia as possible, so we’re going to do some more work with industry to see how we can assist them to develop applicable capabilities for a maritime UAS for about midway through this decade.”

Navy is experimenting with the ScanEagle and S-100 today and while RADM Quinn predicts the next tranche of UAVs to be acquired will most likely be enhanced versions of those sorts of platforms, or similar types, the future is likely to offer a lot of different capabilities to choose from.

“We are planning to have a program which incrementally takes up new technologies in an agile way and meets the evolving operational circumstances. SEA129 will be a good example of that; we will continually evolve capability in tranches, getting the right capabilities to the fleet at the right time,” RADM Quinn adds.

“We have a rolling development

methodology for many of our future programs, where we will continue to evolve the technologies, starting with the small things first. We will be developing our artificial intelligence (AI) capabilities and intend to evolve to an Australian Common Control System and, when we have those foundational things established, we will be well-positioned to build up to whatever capabilities we will require in the future.”

From an industry perspective, Managing Director of Schiebel Pacific Fabian Knechtl says his company has been supporting Navy’s S-100 Camcopter operations under Navy Minor Project 1942 since the platforms were delivered in 2017 and it is also interested in SEA129 Phase 5 (Maritime Tactical UAS) and Army’s LAND129 Phase 3 (Tactical UAS) programs.

“We are committed to increasing our local footprint and we are committed to establishing a production line and engineering presence in Australia,” Knechtl says. “Australian Industry Content has always been an important

consideration for us, but one thing the COVID-19 pandemic has taught us is that it is now crucial to have a sovereign logistics support and training capability. While Schiebel Pacific is part of the Schiebel group of companies, we want to show that it is an Australian company, which uses Australian know-how to produce Australian equipment for Australia.”

Schiebel has recently developed and certified its in-house S-2 engine for the S-100, which uses heavy fuel and is therefore optimised for shipboard deployments. Operational trials with the new engine have been conducted at Jervis Bay Airfield, paving the way for the successful FOCFT aboard HMAS *Ballarat* in July.

Beyond the 3.11 metre, 110kg S-100, Knechtl says Schiebel is considering a larger platform, which he says may be of interest to Navy for SEA129 and Army for LAND129. “We know there’s a demand across the world for a larger platform with a longer endurance and more payload,” he says. ■



AUTONOMOUS MINE COUNTERMEASURES: THE LONG GAME

Over 20 years ago a discussion began between Navy, Thales and other organisations within the defence industry around the potential use of unmanned and autonomous platforms – a revolutionary method of force multiplying the Navy's fleet. Analysis conducted by Navy and independent parties all agreed that these ideas, if put in place, could give Navy significant strategic and operational advantages. Two projects were commissioned by Navy as a result of this analysis – SEA1778 and SEA1770 – that aim to bring capabilities utilising autonomous systems into service, centring on mine countermeasures (MCM) and hydrographic survey.

R&D Projects Manager for Thales Underwater Systems (UWS) Daniel Dent says that when the first acquisition program came into play, the idea was to develop deployable MCM that could be explored and serve as a basis for specifying future capabilities.

"SEA1778, Deployable MCM, was always about informing future capabilities to be acquired by Navy," he says. "It is about testing a basic level of autonomous systems in preparation for the generational change that is to come."

Business Development Manager and former Mine Warfare and Clearance Diving Officer Gavin Henry says that Navy is to be applauded for taking this approach.

"You have to admire Navy for having the courage and foresight



to initiate these conversations, and then to follow them through with SEA1778 Phase 1 as well as those major projects now on the horizon such as SEA1905 and SEA2400," Henry notes. "With any new concept

there are always going to be obstacles to overcome in order to achieve the desired operational outcome. These may include integrating autonomous and unmanned technology challenges, existing acquisition and

sustainment practices, redefining force operational structure and training, and defined concepts of operation and risk profiles to name but a few. In the long run, however, the benefits to Navy will be immense, de-risking MCM activity and providing a serious force multiplier effect – they will be truly game-changing.”

The last significant change to mine countermeasures was during the early 1990s when the first of six Thales-built fibreglass hull minehunters, which were also fitted with Thales sonars, came online. Prior to that there was little change in the technology in use following the Second World War with the aluminium coastal mine-hunting vessels and later, Mine Hunter Inshore (MHI) vessels.

“Turning technology into capability is an ongoing evolution,” says Dent. “Over time the technology has continued to develop, and rather than replacing the fleet with newer versions of the same type of vessel, Navy is moving towards autonomous MCM capabilities to not only do the work the minehunters were doing, but to enhance their operational capabilities. This is a significant change for the force, and it will take time for everyone involved to figure out the best way to do it.”

Dent says that this new type of technology is a generational change akin to other game-changing technologies we have seen evolve over the years.

“Take for example the smartphone,” he notes. “Isaac Asimov predicted the use of smartphones back in the early 1980s – a time when computers were extremely big and bulky. The idea that one day people would be able to use them in the palm of their hand was unheard of. But a few scientists and forward thinkers believed it was possible, despite the technology not being around at the time.

“Today, that technology has revolutionised the way we live; what was once a mere idea is something society may now find difficult to live without. The evolutionary nature of technology requires investment in not only research and development, but also in the next generation of engineers. It’s important to foster

“Today, that technology has revolutionised the way we live; what was once a mere idea is something society may now find difficult to live without. The evolutionary nature of technology requires investment in not only research and development, but also in the next generation of engineers.”

this new wave of thinkers as they’ll likely be the ones who shape its future direction.

“We’ve brought on young, vibrant, innovative engineers from a variety of disciplines who are bringing their expertise and a new way of thinking to mine countermeasures solutions. They have been educated, and acquired their skills, in a period of unprecedented technological change; perfectly equipping them to respond to customer needs and the evolving landscape with ease now and into the future.”

Thales is also investing globally in mine countermeasures capabilities, notably in the Franco-British Maritime Mine Countermeasures (MMCM) program. This program, the first of its kind in the world, develops an end-to-end solution for detection and neutralisation of sea mines and underwater improvised explosive devices.

“This is an ambitious, potentially revolutionary project that our European colleagues have embarked on, as an enterprise with their respective defence organisations,” Henry adds. “Their collaborative efforts, as capability partners to

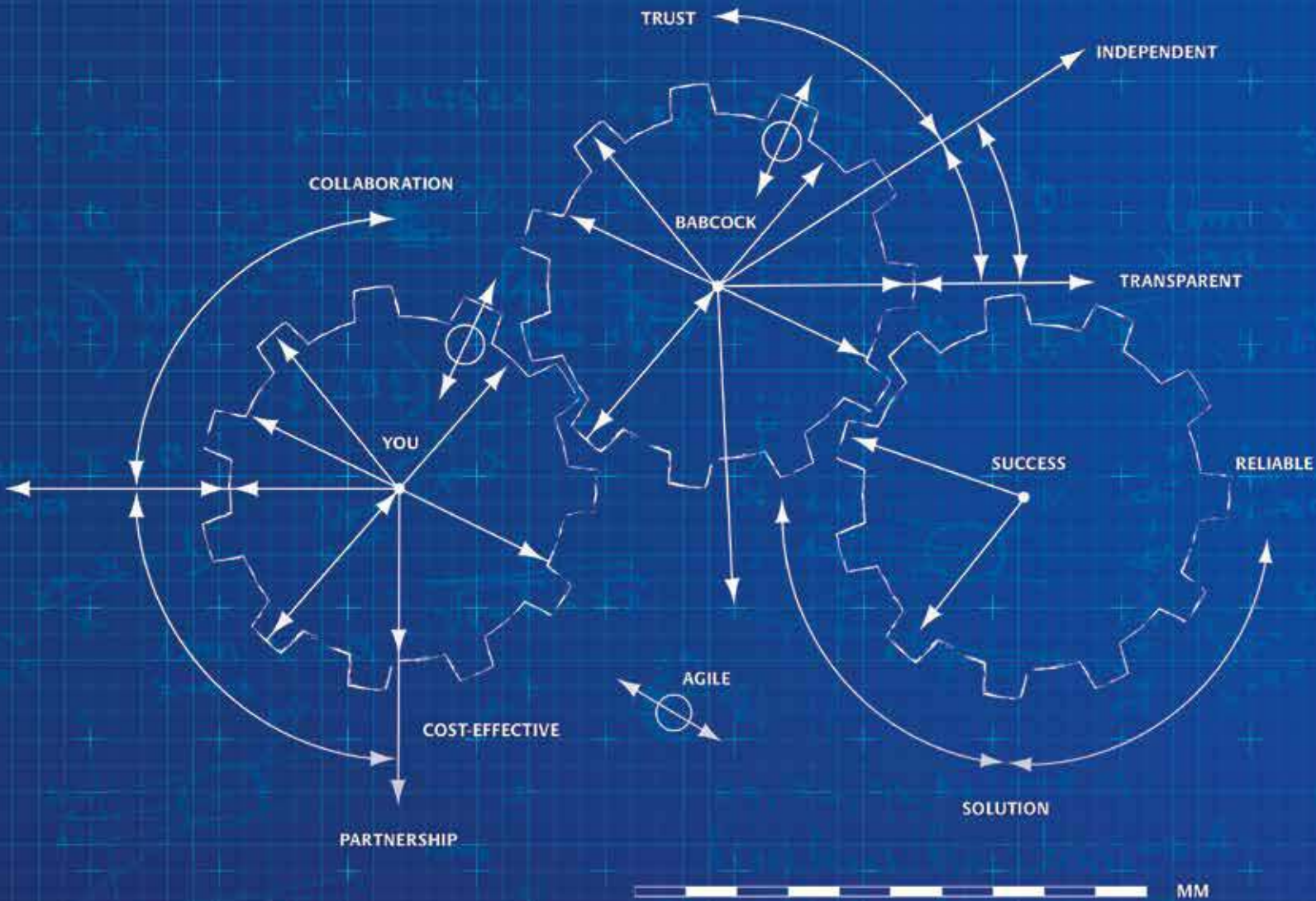
defence, have impressively delivered a mature mission and support system for MMCM Stage 1, that importantly incorporates a number of Fundamental Inputs to Capability (FIC) elements, underpinning the capability. Thales will leverage the enormous investment expended on the development of this system of systems

when shaping its truly sovereign solution here in Australia to ensure interoperability, value for money and most importantly, trust.

“We really believe in where this technology is going, and what it will do for Navy. For this reason, we’ve been engaging academia to establish foundational research within Trusted Autonomous Systems Defence Customer Research Centre (TAS DCRC) and other R&D projects.

“This process won’t just happen in an instant. Navy, with ongoing support from industry, will have to trial solutions and figure out how it will work for particular mission sets. There’ll be adjustments made, further research, advancements in technology and requirements, all of which will go towards introducing the new operational capability. There is no doubt that this is a complex undertaking for Navy; however, they aren’t in it alone with industry, academia and a whole host of others working to support their efforts. We’ve been a trusted partner of Navy for decades now on critical projects, and we’ll be here to continue this collaboration for the long game.”

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PLAN GALILEO: SUSTAINING THE FUTURE FLEET

The Royal Australian Navy is turning to a 16th century Italian astronomer for inspiration, as it seeks to fundamentally change the way in which it sustains its surface fleet. By **Nigel Pittaway**.

Named after Galileo Galilei, who changed the way humankind viewed the universe by suggesting that the Earth revolved around the Sun and not vice-versa, Navy's Plan Galileo will seek to change current thinking about fleet

sustainment, moving from a culture where sustainment is an end in itself, to one which exists only to ensure that the Navy can fight and win at sea in future conflicts.

Launched by Head Maritime Systems of the Capability Acquisition

and Sustainment Group (CASG), Rear Admiral Wendy Malcolm, in May, Plan Galileo aims to develop a nationally integrated sustainment environment by 2025. It will transition fleet sustainment from the current model, where each class of vessel has a bespoke system of sustainment, to an integrated approach which supports the National Naval Shipbuilding Plan and aligns with Navy's ongoing Plans Pelorus (Navy Strategy) and Mercator (Naval Engineering Strategic Plan).

Key to the rollout of Plan Galileo will be the establishment of a number of

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The project had the immediate support of the Commercial and Defence sectors and categorically proved that Cairns has the capability of leading the world in infrastructure investment and could deliver the associated service and skills.

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Delivering on Plan Galileo

BSE is developing the capability to help sustain the Royal Australian Navy's growing fleet.

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Regional Maintenance Centres (RMCs), located around the country to support fleet units based or operating locally. It also aims to build on Australian Industry Capability (AIC), by providing incentive for defence industry to build regional and local capacity as it seeks to develop a fleet-based perspective which will drive commonality across sustainment activities, while minimising duplication of effort across the maritime domain.

Sustainment of the Navy's new Arafura-class Offshore Patrol Vessels (OPVs) now under construction at Osborne in South Australia and Henderson in Western Australia will be the proof of concept for the Plan Galileo strategies when they enter service in 2021.

CURRENT SUSTAINMENT MODELS

There are currently 15 System Program Offices (SPOs) within the Maritime Systems Division to look after the fleet on a platform by platform basis and RADM Malcolm explains that, over the years, each has developed its own way of sustaining the platform for which it is responsible.

"When we've built ships or bought

them, we've looked upon it as its own platform and developed a bespoke approach to supporting and maintaining those vessels. Over time our SPOs have very much focused inwards on how they maintain their particular platform and we haven't tended to learn the good lessons across those SPOs and how we might use them across the Division," she says.

RADM Malcolm adds that, with some exceptions, the Division has not made the most of a cross-class approach to sustainment to recognise and leverage commonality across the various SPOs.

"For instance, if you were to walk aboard four different ships at Fleet Base East, they each might use the same pump, provided by one of our suppliers, but you might find four different ways of paying for spare parts and labour for those pumps, or four different ways of looking after them. One of the key issues is that's difficult for industry, they have four times as many things to consider and four times as many contracts," she says.

Modern warships are very complex platforms and expensive platforms to

acquire – there are over 100 complex systems in their own right integrated together in the Anzac-class frigate, for example – and the typical service life of a vessel is seldom less than 30 years, so sustainment costs over the life of a platform are many times that of their original acquisition.

The new ships being delivered under the National Naval Shipbuilding Plan have been described as the largest naval regeneration since the Second World War and will provide a 'step-change' in capability, complexity and acquisition cost. With this in mind, RADM Malcolm says there is now a perfect opportunity to transform maritime sustainment for the future.

"The aim of Plan Galileo is that in 2025, Defence will operate in a national integrated sustainment environment that consistently provides affordable, reliable and fit for purpose systems and ships to Navy," she explains. "That means ensuring we can provide certainty and work for our uniformed personnel and industry, as we need them working co-operatively, continuing what they do, and helping to prepare our Navy for the new ships that will be delivered in an era of continuous shipbuilding."

PLAN GALILEO IN A NUTSHELL

The National Naval Shipbuilding Enterprise will fundamentally change the way Navy conducts its ship acquisition programs and, from the sustainment perspective, Plan Galileo aims to achieve three key objectives by 2025.

Firstly, it aims to build a new approach to integrated Capability Life Cycle Management; secondly it will leverage new technologies and concepts to improve productivity and also to foster innovation, collaboration and the sharing of knowledge across the maritime domain; and lastly, Plan Galileo plans to raise and sustain a workforce with the necessary skills to meet the fleet's requirements.

"Sustainment has often been driven by opportunity or in response to problems in the past, rather than a systematic approach to getting the best approach for our systems. We're trying to look at how we can make things easier for industry, how we can get better bang for our buck across those systems and across our warships, how we learn those good lessons from our SPOs and also have a more easily understandable, less-bureaucratic approach to how we maintain our warships," RADM Malcolm adds.

"We have also looked at how other navies conduct sustainment, including the US Navy, the Royal Navy and the Royal Canadian Navy, and we've tried to find that sweet spot or the best mix of how we contract, what are the core skills we want to make sure are retained in Navy and what are the important skills we want to grow in industry."

Plan Galileo takes a whole-of-life concept to sustainment, beginning in the design phase of the vessel, and as a result the Capability Life Cycle Management of the platform as an underlying principle is considered from the very outset. Defence says



Rear Admiral Wendy Malcolm

it will rework Navy's concept of sustainment to adopt a fleet view, to drive commonality and minimise duplication across the fleet.

A further focus of Plan Galileo is to grow and support Navy's technical and logistical capabilities and this will include the ongoing involvement of Fleet Support Unit (FSU) repair and maintenance organisations across the country in the delivery of ship maintenance activities and the development of Maritime Logistics personnel to support supply chain development and management.

"We're still going to have our SPOs and they will still ensure the asset management over the life of the platform, but we're going to consolidate where we can and use best practice in our commercial models to drive better support and more effective and efficient processes," RADM Malcolm says.

"And we want to centre those in the various regions where our ships are home-ported, principally for us in the maritime sustainment space in Perth, Darwin, Cairns and Sydney."

REGIONAL MAINTENANCE CENTRES

Each Regional Maintenance Centre will consolidate the Navy Fleet

Support Unit with the industry prime contractors, local small to medium enterprises (SMEs) and suppliers and each will have the ability to sustain several different classes of Navy's surface fleet.

Each RMC will leverage the local ecosystem that has been built up around it and, while the SPOs will remain in place, they will be responsible for contacting the centre to inform them of what work needs to be done and how it is to be completed.

"The SPO still has a role to oversee that asset management through life and will ensure that this will continue, but we recognise that you don't just need to have that happen within the SPO. Even now we outsource the maintenance to local companies, but that work is split up by platform," RADM Malcolm explains.

"For instance, if we were to consolidate the maintenance activities in Sydney into one Regional Maintenance Centre, it gives it the ability to cross-level resources and better manage the maintenance schedule. It still needs to meet Navy's operational requirements, but we want to get industry to help us do that more efficiently."

One of the key considerations is the desire to avoid a return to earlier practice, which could often result in every maintenance availability contract being put out to tender. The Plan Galileo concept will take a longer-term view of these maintenance requirements or opportunities on a regional basis, which will allow the industry primes to foster enduring relationships with the local SMEs and provide them with the opportunity to plan ahead for several years.

"At the moment we still have the situation where many companies don't really have an insight into what work they may have in a few months' time and we want to try to encourage

“The aim of Plan Galileo is that in 2025, Defence will operate in a national integrated sustainment environment that consistently provides affordable, reliable and fit for purpose systems and ships to Navy.”

greater visibility and transparency and also investment in those areas, so we can grow those smaller companies and make sure they have that certainty as well,” RADM Malcolm adds.

An example of the eco-system which has grown up around a Navy home-port is the Henderson strip in Western Australia, located across Cockburn Sound from Navy’s Fleet Base West. Henderson is home to a Common User Facility, which allows various maritime companies to conduct work within its boundaries. It is also the home to Civec, manufacturer of the majority of Arafura-class OPVs, industry primes

such as Austal, BAE Systems Australia, ASC and Raytheon and a number of supporting SMEs. While the RMC in Darwin may not be as large as Henderson, it will grow a scaled eco-system around it to support activities in Australia’s Top End.

“We are really trying to build from where the continuous shipbuilding plan is taking us and maximise opportunities and we have to be ready for those new ships to come,” RADM Malcolm explains. “Also, it is very important for Navy and the nation to maximise those opportunities for Australia on a number of fronts. We

want to make sure that when these shiny new and capable ships are delivered we can sustain them, and we can sustain them with a capability that is inherent in the country.”

BUILDING AUSTRALIAN INDUSTRY CAPABILITY

RADM Malcolm says it is important to note that much of the support for Navy’s surface fleet today is already provided in Australia, by Australian companies, although some systems and weapons support will always need to be done by overseas companies. In the case of US Foreign Military Sales (FMS) or International Traffic in Arms Regulations (ITAR) requirements for example, that work is required to be performed by US citizens.

“If I take the current Anzac ships as a good example, they already drive an AIC approach through the sustainment

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contracts and the maintenance of those ships over the past 10 years or so has resulted in almost 90% of the support base and input actually being provided by Australian companies. We want to make sure we keep that going and actually further incentivise Australian companies to grow," RADM Malcolm explains.

"This is one of the key approaches that we want to drive, through Defence Industry Policy and CASG, to really incentivise, motivate and grow further development and investment and have that work done by Australian companies. We want to incentivise that to happen quickly in key areas we want to ensure we have in place for the future – those sovereign capability areas like combat systems, looking after our hulls and how we integrate complex systems. We recognise that this work is important, and we want

Australian industry to do that."

To support these goals, Maritime Systems Division is also working closely with state governments to determine how they can partner to develop the Regional Maintenance Centres, particularly in Western Australia and Queensland, to foster local industry and also to ensure competition for infrastructure, resources and workforce with other industrial sectors does not have an impact.

Infrastructure is a critical element to the success of Plan Galileo, which will consider what will be needed out to a horizon perhaps decades from now, and already there is significant investment being made in the RMC locations, in terms of wharves and underlying services. Similarly maintenance infrastructure, floating docks, cranes and ship lifts, for

example, are required in each area and work is underway to determine what needs to be constructed and/or upgraded.

"The workforce piece is also very important and we're leveraging the great work being done by the Naval Shipbuilding College to make sure we're building the workforce skills in those state regions to support continuous sustainment," RADM Malcolm adds.

"Also our Navy people and public service and all the people that make the enterprise work, a good example is we don't have nearly enough Naval Architects in Australia at the moment and we need to make sure we will have enough to support the future of shipbuilding and sustainment of Navy as we move forward."

RADM Malcolm's Division is also engaging closely with industry, via

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“At the moment we still have the situation where many companies don’t really have an insight into what work they may have in a few months’ time and we want to try to encourage greater visibility and transparency and also investment in those areas, so we can grow those smaller companies and make sure they have that certainty as well.”

a series of workshops and design laboratories to seek input on how the RMCs would work. While this work has been hampered to some degree by the COVID-19 restrictions, the physical roadshows have been replaced by online forums, webinars and virtual design laboratories.

“I want to reassure industry that we will continue to consult with them and invite their feedback and participation, but we’ll probably be doing that in a different way to what we originally envisaged. It’s something we’re concentrating quite hard on at the moment,” RADM Malcolm says.

TRANSITION TO GALILEO

The first new class of ship to be

delivered under the continuous naval shipbuilding plan will be the Arafura-class OPVs and they will form the ‘proof of concept’ for Plan Galileo. Defence has recently released a tender to industry for the Arafura Capability Lifecycle Management contract and the RMC tender is expected to follow later this year.

“They are the proof of concept strategies, looking at how we will do this work in the future and, if necessary, tweaking it to make sure we get it right,” RADM Malcolm explains.

A key aspect of this is the consideration of the supply chain and making sure that contracts are suitable for the maintenance of components

across ship classes, across regions of Australia and, where possible, for extended periods. It is one thing to build a regional base for shipbuilding, but it must provide return on investment for Navy, and this may result in the establishment of centres of excellence in one location, for example to ensure surety and longevity of combat systems management and development, rather than trying to replicate work in each RMC.

“I want to reassure people that what we’re doing is trying to take the best concepts, procedures and ideas from all our SPOs and putting those in place,” RADM Malcolm concludes.

“We have learned a lot from new contracts we have recently put in place for patrol boats in Darwin and for the (Canberra-class) LHDs for example. In some ways, people will recognise a lot of what they will see in this new approach. This is taking a best-of-breed approach and it is an evolution rather than a revolution in sustainment.” ■

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ENGINEERING RISES TO THE CHALLENGE

Navy Engineering is now at a point where it is much better prepared to meet not only the challenges of today, but the challenges ahead, according to Rear Admiral Col Lawrence. By **Lachlan Colquhoun**.

As he prepares to complete his tenure as Head of Navy Engineering, RADM Col Lawrence can be satisfied that Navy Engineering has come a long way.

He freely acknowledges that the 2011 Rizzo Report, Plan to Reform Support Ship Repair and Management Practices, exposed significant problems with Navy's maintenance and sustainment

programs, and that engineering was not immune to the criticism that Navy had historically focused on operational outcomes at the expense of the technical integrity of its platforms.

The upside of that, he says, is a new and refreshed approach which has improved seaworthiness and availability across the Navy, and set up processes and doctrine for an

exciting decade ahead.

"We've certainly come a long way since the Rizzo Report, and we had to because the continuous shipbuilding program is a completely different challenge to the one we faced in 2011," says RADM Lawrence.

"The Rizzo Report highlighted inadequate maintenance practices within the Navy due to many factors.

"There was poor whole of life asset management, organisational complexity and blurred accountability, inadequate risk management, poor compliance and assurance, and a hollowed-out Navy Engineering function."

These fundamental issues have taken almost a decade to address, and Navy Engineering is now at a point where it is much better prepared to meet not only the engineering challenges of today, but the challenges ahead.

"Ten years ago, we were focused



on regenerating our ability to keep the fleet at sea," says RADM Lawrence. "Right now, in addition, we are supporting three new ship acquisition programs, all of which will be constructed in Australia.

By way of example, the future submarine program could become the most complex engineering program our country will undertake.

"And at the same time we are going to build patrol vessels and a highly complex future frigate onshore, with an aim to also bring the design onshore so that we can continue to design and build naval ships in this country.

"All three of these programs are significant engineering undertakings, and if we hadn't sorted out our fundamentals in the past decade, the future would be much more complex than it already is."

Navy's new strategic approach addresses many of the issues around

the asset management lifecycle identified by the Rizzo Report.

Rizzo found that during the planning and acquisition of new capability, there was a tendency to focus on delivery above all else.

"The intense political, media and leadership attention on acquisition means that there is a focus on schedule, budget and specification," the report said. "As a consequence, this means that the project manager has only limited options if pressure or constraints arise. As a result, sustainment is neglected in priority, which leads to inadequate logistic support products and increased sustainment requirements, often to the detriment of whole-of-life capability and costs."

Navy's first response culminated in the Naval Engineering Strategic Plan 2013-2017, which was a foundation to rebuild the Naval Engineering capability, consistent

with the outcomes of the Rizzo Reform Program.

This was followed by a second five-year plan with six key themes. The plan included a "complete rewrite" of Navy Engineering doctrine, policy and procedures, right down to class-level publications which are a "major and fundamental improvement".

Among the themes was a requirement that Navy Engineering be fully embedded across the Capability Life Cycle. To this end, Principal Engineers are now appointed in all sustainment offices and acquisition projects, and Centres of Expertise technology cells are now delivering warranted engineering advice focused on Capability Manager requirements.

"The biggest change has been in how engineering authority and accountability is delegated out throughout the Navy," says RADM Lawrence. "Three years ago, we completely changed our system and now we have a structure where there is clear accountability delegated through our engineering workforce.

"Even three years ago, we were very inconsistent about how engineering was organised across the Navy, now the outputs are much more consistent and the responsibilities are more clearly understood."

Naval Engineering, says RADM Lawrence, is a discipline. It is a body of knowledge and practice that delivers seaworthy materiel within a culture that demands professional behaviour and accountability. The application of this discipline underpins Naval Engineering into the future including implementation of the Defence Seaworthiness Management System.

Authorised Materiel Seaworthiness Delivery Organisations (AMSDO) are now established throughout

the Navy which, at their core, are designed to bind engineering, maintenance and support systems together from very early in the Capability Life Cycle right through until disposal.

The Naval Materiel Seaworthiness Assurance Agency is providing assurance of materiel seaworthiness, with RADM Lawrence conducting monthly “deep dives” into the Navy Assurance Management System to confirm his confidence in the materiel seaworthiness of the fleet.

Intrinsic in all of these activities, RADM Lawrence says, it is imperative that the Navy Engineering community accepts the responsibility and accountability allocated to it for the delivery of seaworthy materiel, safe and operationally effective maritime capability and responsible environmental outcomes.

As HNE, RADM Lawrence’s priorities have been to:

- Clearly define how Naval Engineering contributes to the definition and acquisition of seaworthy materiel.
- Optimise Naval Engineering services for the effective and sustained delivery of seaworthy materiel.
- Promulgate Naval Engineering policy for implementation across the Defence maritime domain.
- Organise the Naval Engineering workforce to efficiently and effectively support the sustained delivery of professional engineering and maintenance functions.
- Implement an effective Naval Engineering operating model.
- Provide confidence in materiel seaworthiness through a risk-based assurance program.

Another major change, says RADM Lawrence, has been the relationship between Navy and civilian contractors.

“Historically we had quite an adversarial relationship with industry, we saw industry almost like an opponent,” he says.

“In my role as Head of the Navy Engineering Community, we can’t afford to do that and it won’t deliver the results we seek. We have so much shipbuilding work coming down the pipeline that we have to look at our workforce as an enterprise, whether our people are in uniform or whether they are contractors or public servants, they all need to be focused on the



Rear Admiral Colin Lawrence

outcome, that is the only way that we will achieve the challenge that has been laid down for us. It will require a cultural change from both sides.”

The imperative, says RADM Lawrence, is that Australia is about to embark on “major programs that will define our Nation”. The next generation of Navy ships, across several classes, will be built in Australia and will be maintained and sustained in Australia. For this, Navy Engineering needs to be up to the task.

“We have a large engineering and technical workforce, dispersed all over the country, pocketed away in all areas of the Navy,

covering everything from platform, mechanical and propulsion systems, aviation systems, through to high-end combat management and warfare systems,” he says.

“The range of technology the Navy Engineering workforce has to support is phenomenal.

“We have worked very hard to form and deliver a consistent message over the last few years, and this is setting us for what is a highly complex undertaking so that Navy Engineering can deliver to the nation.”

Work has also commenced on the next Navy Engineering Strategy, laying the foundations for the next HNE, Rear Admiral Kath Richards through to 2025.

RADM Lawrence’s message to the Navy Engineering community moving forward is very concise: “Navy Engineering empowers the Navy with the technology to fight and win at sea, and values innovation, collaborative leadership, professional excellence and technical mastery”.

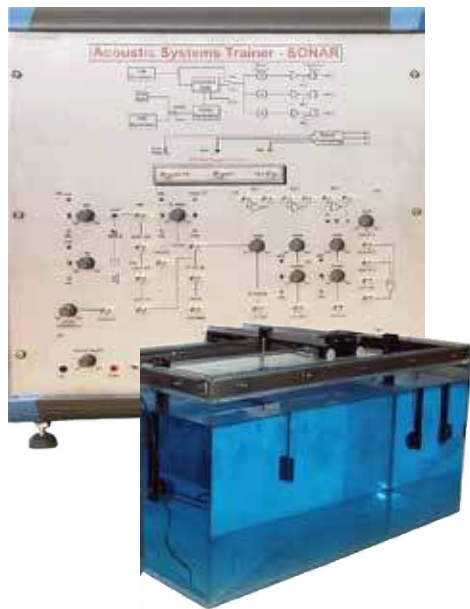
Within the context of the Next Generation Navy (NGN) project, this message formally places people and culture at the forefront of the Navy’s Engineering strategy and recognises that Navy’s platforms are ultimately objects that deliver capability through its people.

“Many of us within the engineering community have served at a time where there has never been enough qualified engineers and technicians to support Navy capability,” says RADM Lawrence.

“By way of example, the Marine Technician category has been categorised as ‘critical’ since 1999. I am committed to changing this and I am fully supportive of the NGN reform agenda to build a professional and inclusive engineering culture.” ■



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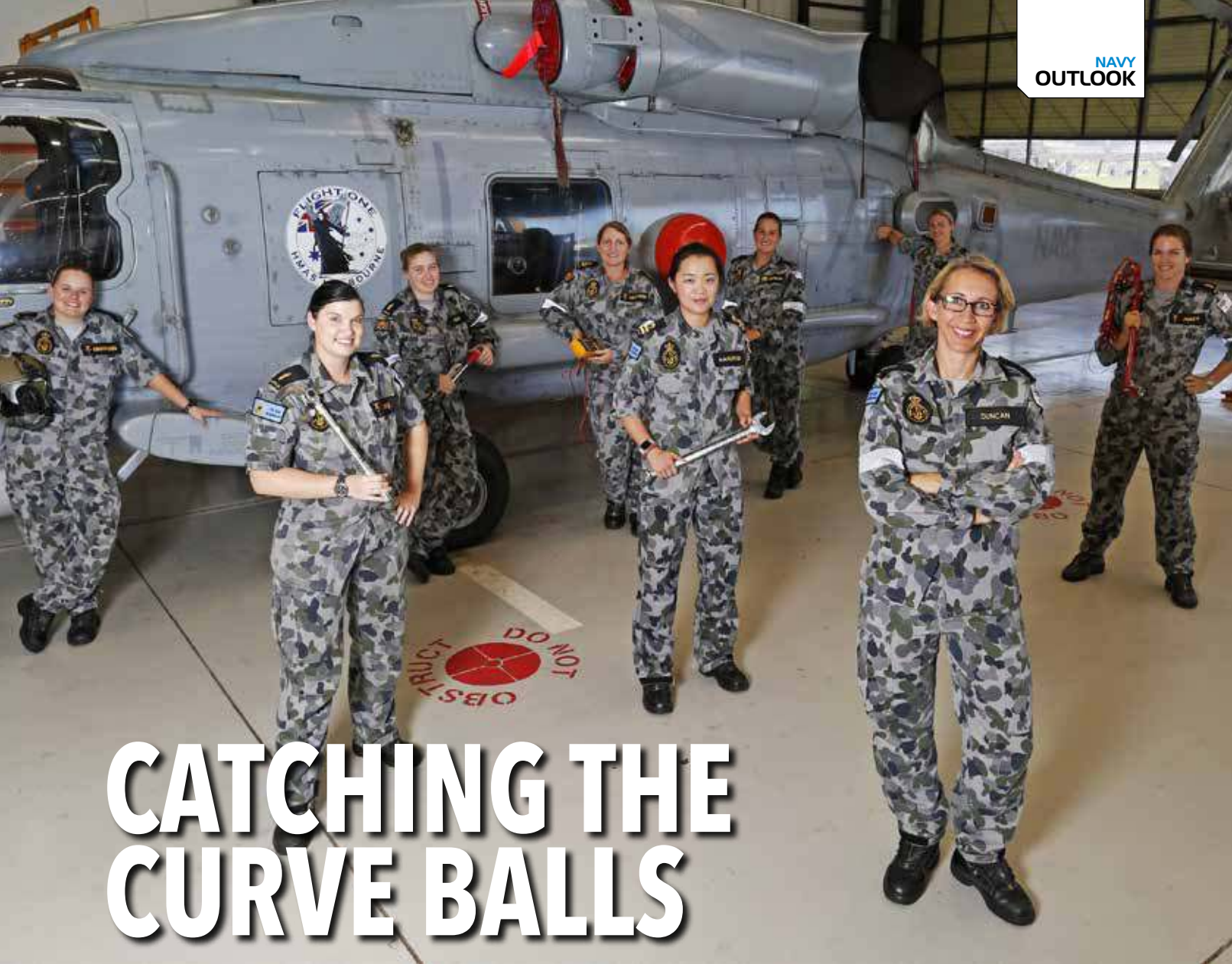
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CATCHING THE CURVE BALLS

After a career of notable firsts, Rear Admiral Katherine Richards is set to become Head Navy Engineering in early 2021, the first female officer to hold that position. Ahead of taking up the role, she talked with **Lachlan Colquhoun** about her career and embracing resilience as a driver of success.

It is impossible, says RADM Katherine Richards, for someone to overcome hurdles unless there is something for them to jump over.

She uses the analogy to make a key point about her approach to life and her career: resilience is only built and created through facing challenges and

sometimes adversity.

"When everything goes our way it's pretty easy to achieve success," RADM Richards says. "But I think there are a few traps in that, because that doesn't help you develop as a person and you can become quite brittle and fragile when you don't have to overcome anything.

"You can only understand the strengths you have when things don't go your way, and that helps you learn to adapt and evolve and also to negotiate."

RADM Richards' naval career has been a distinguished one almost from the moment she joined the Navy three decades ago.

She joined "in search of something different", she says, in an era when girls with academic achievements usually chose either medicine or law.

"Also, it was the 1980s and it was a very materialistic period, when it was all about the individual and money," says RADM Richards. "That didn't really appeal to me, I found it quite hollow. I was more interested in the



idea of service and working as part of a team, and that is what led me to the Navy.”

Her career began with a Bachelor of Engineering with First Class Honours at the Australian Defence Force Academy which led – thanks to a telegram received when she was on duty in the Southern Ocean – to a scholarship studying warship design at University College in London.

Operationally, RADM Richards has been the engineer on the Leeuwin class hydrographic ships and also the guided missile frigate HMAS *Melbourne*, and saw service in the Solomon Islands and in the Persian Gulf.

She was able to serve with distinction despite suffering from constant sea sickness, a condition she learned to manage with advice from celebrated British aviator Group Captain Leonard Cheshire, famous for flying in the Dam Busters raid on German dams in World War II, who visited ADFA in the early 1990s.

From him, RADM Richards learned

the technique of “shortening time”. On dangerous bombing raids, Cheshire would give himself a 15-minute timeframe, after which he would congratulate himself on still being alive, and check in with his team. It managed his stress and fear, and helped him get through.

RADM Richards then adapted that technique to manage her sea sickness, and would break down a watch or a task into smaller time periods.

“I’d be proud of myself if I could go into an engine room, complete a set of rounds and come back out again and not have vomited,” she says. Later, she had to deal with extreme morning sickness while working through her pregnancies.

Then there was a Master of Science in Marine Engineering and a Master of Management in Defence Studies, where she “wrote 10,000-word theses while looking after three small children”.

RADM Richards has received a Conspicuous Service Award for outstanding achievement as the first

female commanding officer of HMAS Cerberus and is currently the Navy’s Director of Engineering, after recently completing a stint as Chief of Staff at Navy Headquarters.

Looking at her naval career, it might look like plain sailing but there were obstacles and barriers along the way.

As one of the first female officers, she faced institutional barriers based on her gender but was already familiar with this from her mother’s career. Both of her parents were naval officers, but her mother had to resign when she was married as this was the regulation back then.

As a midshipman, RADM Richards was unable to join her male colleagues on a training cruise to New Zealand because there were no quarters for women, and had to train alone in Cairns. There, she had to sleep in the sick bay because there was not a cabin which could accommodate a woman.

Later, she was not able to serve on the Charles F. Adams class of destroyers to study the steam turbines,

but was still required to pass all of the examinations.

Today, RADM Richards says these barriers have been “blown away” in the Navy of 2020, and not only is that an advance for gender equality, but it is also an advance for the ultimate capability of the Navy.

“Removing those internal barriers has created an organisation which is more capable, and made us better warfighters,” she says.

“Removing barriers gives people freedom to develop and grow, and doesn’t artificially constrain the system, and if you can give people that freedom you can be amazed at what they can produce.”

These have not been the only barriers or “curve balls” that RADM Richards has been thrown.

Her husband is Army Colonel Bernie Richards, who was diagnosed with a serious brain tumour back in 2018, beginning an anxious family journey of treatment and care which has seen him emerge with a positive prognosis.

“It taught me all over again that you develop skills when hurdles come your way,” says RADM Richards.

“I had to learn new skills as a middle-aged woman I’d never thought of, such as dispensing medication, being a patient advocate and how to really care for someone.

“If you don’t have those hurdles in front of you then you just don’t grow.”

The only response, she says, to these curve balls is to catch them and keep going, “because that is what life requires of you”.

RADM Richards then segues this back into making a point about Navy, and how ongoing professional education is not only a personal investment, but functions as a “multiplier” for Navy’s capability.

“Keeping on with education and training is about investing in our human capital, and continually driving our people to realise the potential of



Rear Admiral Kath Richards

our teams,” she says. “We can’t always get more people in terms of numbers, but we can upskill the people we do have in terms of their technical ability, their profession of arms and skills as warfighters.”

This helps deliver the “thinking navy” where people do not sit still in developing their professional mastery, because the nation “demands that we are at the top of the game to deliver a warfighting effect”.

Within the context of being a team player, RADM Richards says she has always “run her own race” in life and is committed to running the best race she can.

She is committed to the idea of being a “servant leader” who uses her leadership skills and position as a way of maximising the success and capabilities of those under her command.

While she makes no claim herself for the significance of being the first woman in her new Head Navy Engineering role, she understands that it is significant for other people. She has run her own race, but that race has been important to other people.

When her promotion was announced, for example, she was deluged with congratulations to the point that her email inbox crashed.

“I really respect that many of our female veterans see my promotion as part of their legacy, because they were denied the ability to advance in the past,” says RADM Richards. “For many of those women the fact that there is a female admiral is an absolute cause for celebration, and I respect that because in some ways my achievement is also an acknowledgment of what built the Navy.

“Then there are younger women who are serving today, and for them it gives them encouragement that when those curve balls come their way, there is someone who looks like them and has been able to catch those curve balls and still get there, so I am sensitive to that and am striving to deliver to these expectations.”

On the subject of engineering, RADM Richards sees the Navy as being “underpinned by technology and by people”.

“If you don’t understand the technology and don’t respect the people you can’t get to where Navy wants to be,” she says.

“Engineering itself is really a human endeavour, but it’s about how you take the language of mathematics and apply the rigour of the scientific process to develop solutions to problems, and that is an amazingly rewarding profession to be a part of.”

Good engineering, she says, is about knowing and understanding the design of our ship, understanding its maintenance requirements and liabilities, and the strengths and weaknesses of the supply chain.

“When you bring that together, you have the solid foundation to upkeep, upgrade and update your fleet, and that is really what naval engineering delivers to the Chief of Navy,” says RADM Richards.

“To be Head Navy Engineering is a profound privilege, and I will acquit it with all of my energy and hope to deliver these results.” ■

OUTLOOK

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SCHOLARSHIP WINNER DRIVES NEXT GENERATION SUBSEA CAPABILITIES



Lieutenant James Keane was studying for his Naval Architecture degree at the Australian Maritime College when one day a Canadian professor arrived with a “little yellow submarine”, and stories of how he had been in Antarctica training astronauts how to explore beneath the ice with robots.

Keane was fascinated by the potential of Autonomous Underwater Vehicles (AUVs), and it has led him into an area of research which saw him awarded with the Navy’s Holthouse Memorial Scholarship.

“I became really excited at the potential of robotics to improve the capability of the Royal Australian Navy, and so that is my focus,” says Keane, a Marine Engineer based at HMAS *Waterhen* in Sydney.

AUVs are used in hydrography and mine warfare, and are typically pre-programmed to conduct their missions, which are in dynamic and unpredictable environments and can be up to 24

hours in duration.

With pre-programming, the operator sets the AUV’s path for the entire mission, including the exact location for surfacing and recovery, but this can be risky as the mission is influenced by changing factors such as the weather or threats.

Keane’s work is to use what he calls a “back seat driver”, which enables the AUV to respond to environmental changes, and “make its own decisions” while on the mission using a technology called probabilistic robotics.

Before this scholarship, Keane had travelled to Iceland, Singapore and the US to further his research, and presented his work on AUVs at the US Naval Undersea Warfare Center.

Trials had been planned over 2020 in the US, but will now take place in Australia at Jervis Bay as a result of the COVID-19 pandemic restrictions.

Keane describes his work as an “evolution” in the capability of AUVs, which are expected to play an

increasing role in future subsea and amphibious capabilities, such as mine-countermeasures, surveying, and anti-submarine warfare.

“Automated launch and recovery is a known challenge in AUV operations and my work is to improve that to enable multi-platform autonomy, and to increase the flexibility in AUV operations in general,” says Keane. The first step of this is to work with the Defence Science and Technology Group to implement a solution for AUV homing.

“The approach we are taking comes from a niche area of mathematics, but it has enormous implications for this capability and that is what I like about it.”

Keane is also researching the implications of this work for Trusted Autonomous Systems as part of his Masters of Systems Engineering (Test & Evaluation) through the Australian Defence Force Academy. He will be supervising an engineering student next year as they investigate whether artificial intelligence could improve confidence in new AUV behaviours.

The Holthouse scholarship is for a duration of two years; Keane was announced as the recipient at the PACIFIC 2019 event, and he will present his research at the same event in 2021.

The scholarship encourages the development of professional engineering mastery to grow naval capability, and is named after Rear Admiral David Holthouse, a distinguished naval officer who excelled in engineering and technical training.

Rear Admiral Holthouse had a 43-year career in the Navy and passed away in 2013. ■

THE ART OF THE POSSIBLE: WHY ENGINEERS NEVER STOP LEARNING

In the new decade, the Royal Australian Navy will place more emphasis than ever on building mastery in its engineering personnel. Engineers fill diverse roles within the Navy, from maintaining ageing ships and blending older technology with new systems, right through to pushing the boundaries of what is possible with the new Attack class submarine fleet.

As modern engineering transitions from an industrial focus to a cyber-physical systems focus, it has never been more vital to curate the skills and abilities that keep an engineer curious. In a navy career and beyond, staying relevant while moving forward requires the mindset of a lifelong learner.

WE ASK LEADERS: WHAT DOES TOMORROW'S ENGINEER LOOK LIKE?

The engineers of tomorrow will be skilled in both technical prowess and relationship building. But this does



Dr Bronwyn Evans HonFIEAust CPEng EngExec FTSE
CEO, Engineers Australia

not change the need for a solid technical engineering background – rather, engineers will be involved from start to finish to meet the customer's requirements. Like it or not, this puts communication at the core of the engineering process, including the ability to work with people to solve problems.

Dr Bronwyn Evans is the CEO of Engineers Australia, the peak membership body for engineers in Australia and a strong partner in developing Navy's engineers. Dr Evans knows the value of building teams with strong abilities to communicate, consume information and flexibly apply their knowledge.

"Retaining the ability to learn has become the one skill every engineer must develop. Whatever we know now and whatever environment we operate in now, it will not be the same in 10 or 20 years' time," says Dr Evans.

An engineer who is actively shaping Navy's future is Gary Swarbrick, Chief Technical Officer at Naval Group Australia. Swarbrick and his team are working on the Future Submarine Program, designing Australia's new Attack class submarines. Swarbrick views the engineer of the future as a thinker and an integrator, able to navigate a changing world successfully.

"Tomorrow's engineer will need more or less the same skills as the engineers of today; to be able to translate the end user's requirements into a viable solution, while harnessing the latest that technology has to offer and

taking into account what may be technically possible in the near future."

LEARNING COMES IN ALL SHAPES AND SIZES

Communication skills, the ability to learn and critical thinking: these are all skills that take work to master.

Working on these skills might look like work experience in another department or group, to gain the technical expertise to move you forward. It might also look like staying connected with organisations like Engineers Australia, where professional development is part of the culture.

In the demanding environment of the military, this focus can slide to the back burner. But to stay ahead, it is wise to demonstrate your diversity of experience and leadership in your chosen engineering field. One way to do this is to become a Chartered Engineer.

The Chartered Engineer credential is provided by Engineers Australia. Dr Evans describes it as "a mark of your excellence as an engineer". Reaching Chartered recognises that you have demonstrated the skills required for the engineer of the future and committed to ongoing professional development.

Engineers Australia works with each Chartered candidate to gain the credential, with flexible learning pathways and evidence requirements that do not interfere with your Navy role. No matter your specialisation or area of



ENGINEERS
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Gary Swarbrick FIEAust CPEng
APEC Engineer IntPE(Aus)
Chief Technical Officer, Naval Group Australia

expertise, Chartered builds your portfolio to encompass the full range of modern engineering experiences that you might not get from a niche role.

Navy is increasingly looking for engineers to have proven their skill set, particularly when it comes to advanced engineering roles, like combat systems engineers or warrant holders. Status as a Chartered Engineer simplifies the process of proving yourself across systems, a breadth of experience and a depth of competency. Chartered Engineers can get the job done.

Because of this status, Chartered is more than just a nice idea; it is becoming a sought-after requirement for both civilian and naval engineers. What's more, Chartered is a globally recognised credential that can open the door to career possibilities around the world.

The Naval Civilian Engineer Development Program brings graduate engineers into Navy engineering while building their competency to become Chartered Engineers. Engineers Australia partnered with Navy to create the program, integrating the pathway to Chartered.

The Chartered qualification is important to civilian organisations as well, Swarbrick notes. "I try and encourage all the young engineers that work for me to become Chartered. It shows that you've reached a level of proficiency, a level of competence, and it should be the norm in the engineering industry."

TAKE UP THE CHALLENGE

So, what does the future hold for Navy engineers? The challenge of professional development is here to stay as Australia's focus moves

towards building our own Defence and manufacturing capabilities.

Experienced, well-spoken engineers will be in high demand, particularly those who already have the Chartered credential under their belt.

Dr Evans agrees and says that a strong network of engineering peers will continue to be an advantage for those who can look outside their current, focused work.

"If you're thinking about the future, get involved with Engineers Australia. We're about much more than Chartered – you can network, you can either be a mentor or be mentored, and you can build new skills that you wouldn't otherwise have the opportunity to build."

Swarbrick encourages engineers to meet the future head-on with a vivid imagination. "Our job as engineers should be to imagine how we can use new technology in our own area of expertise and in our own application. I'd like to think that we imagine the art of the possible. And I think that'll be as true tomorrow as it is today."

Visit www.engineersaustralia.org.au/Chartered



LOGISTICS THE KEY TO ENDURANCE



Well-executed logistics means ships can be resupplied at sea, which maintains combat readiness and extends the Navy's warfighting capabilities.

Lachlan Colquhoun spoke to Commodore Simon Ottaviano, Director General of Logistics, about this critical aspect.

Without its logistics operation, says Commodore Simon Ottaviano, the Navy would stop functioning.

"It is like oxygen and the air we breathe," says CDRE Ottaviano, the Director General of Logistics for the Navy. "Logistics is the critical and driving factor in everything you do – before you deploy, while you deploy and after you return.

"We focus on everything from food to clothing, fuel, explosive ordnance, medical supplies and every spare part in every ship and piece of equipment we use."

Warships, says CDRE Ottaviano, are not only floating platforms for weapons but they are also "floating warehouses".

Well-executed logistics means the ship can be resupplied at sea, without

having to return to port. This maintains combat readiness and extends the Navy's warfighting capabilities.

In his role as Director General of Logistics, CDRE Ottaviano is responsible for all Navy logistics doctrine and policy, and also for articulating the logistics requirements for the current and future capabilities. This involves providing assurance to the Chief of Navy on the operational capabilities, and that future capabilities are logistically supportable and sustainable.

A naval officer for more than three decades, CDRE Ottaviano has made a career as a logistics specialist, spending time serving in Iraq and the Middle East and in Hawaii with the US Pacific Fleet.

Prior to his current role, he was the Head of Acquisition and Sustainment

for all Guided Weapons and Ordnance for Navy, Army and Air Force, a joint defence role "and requiring a very different skillset".

"You could say it is simply another stock number but when you are dealing with ordnance there is certainly more to it than that," he says.

Another of CDRE Ottaviano's current roles is as the head of the navy logistics community, a group comprising around 1,500 personnel in roles such as Maritime Logistics Officers, Supply Chain Sailors, Support Operations Sailors and the Navy's Chefs.

"My position has been around for 30 years or so in the Navy, and it's about focusing on the people and their professional standards," he says.

"It allows me to focus on making sure we have sufficient people who are suitably qualified and trained. Because without the people, the stores and stocks are useless, no matter how much you have."

Members of this community are employed everywhere in the Navy.

"Wherever you have ships, submarines, aircraft or a naval base, it has to be sustained and members of our logistics community are there," says CDRE Ottaviano.

"We have fleet logistics support all around the country, in Darwin, Cairns, in Garden Island WA, in Sydney and at Nowra at our Naval Air Station."

Technology also plays a role in naval logistics, and Navy continues to automate its warehouses and look at the latest technologies in tracking and tracing and storage, such as state-of-the-art human-free air-conditioned environments for sensitive items.

Some of these facilities are shared across the Defence Force, which has a joint logistics organisation delivering from a central point in most states.

A new enterprise resource planning (ERP) system is set to be rolled out to replace most legacy information

systems, not just in logistics but also for finance, human resources, engineering and maintenance. A key enhancement will be new business automation processes.

"This will provide an amazing awareness in areas such as the maintenance status of equipment on ships, so when there is a breakdown we make sure a suitable person is assigned, and we can locate the right stores," says CDRE Ottaviano.

"It will give us complete traceability from the able seaman to the admiral."

In understanding how logistics is contributing to the Navy's performance, CDRE Ottaviano says the key metric is "endurance". Ships, for example, have set endurances, so the task of the logistics community is to make sure the ship is operational within the tolerances of that endurance level, from food right through to weapons.

"These are things which people could take for granted but which are critical factors in determining how long that ship or submarine can do what it needs to do," he says. "And this also involves constantly monitoring the training and proficiencies of our workforce as well as our stock levels, and our ability to resupply, track and stocktake."

All those capabilities were used in a humanitarian role in Operation Bushfire Assist in January 2020, as Navy personnel rushed back from leave and went to sea to assist people stranded by the bushfire crisis on the eastern seaboard.

"In that humanitarian role, we needed to make sure we had loaded everything from blankets to stretchers and baby formula and pharmaceutical supplies, and items needed for young children or the elderly," says CDRE Ottaviano.

For naval personnel, there was personal protective equipment and flame retardant uniforms.

"It was a big challenge but everyone I spoke with felt an overwhelming desire



Commodore Simon Ottaviano

to help their fellow Australians," says CDRE Ottaviano.

"Many of our people deploy overseas, but having the opportunity to help at home was unique and very satisfying."

A third role for CDRE Ottaviano is as the Chair of the Navy's Central Canteen Board, guiding a unique institution within Navy which celebrates its 65th anniversary in 2020.

In addition to managing 16 canteens on 10 naval bases, the organisation functions as a welfare and recreational services provider to naval personnel and their families.

The Board also operates two caravan parks and owns holiday apartments which are available to Navy families for holidays.

There is also a concert ticket service for theatre and music concerts.

"We have provided \$5 million to fund Navy recreation grants over the last 10 years, and another \$2 million towards our own relief trust fund which offers free loans to people when they are in need," says CDRE Ottaviano.

"We are a separate entity within Navy with our own board, and are a not for profit organisation which means we invest back into the welfare of Navy personnel, past and present, and their families." ■



COMMUNICATING THE MESSAGE

In her role as Director General of Navy Communication and Coordination, Captain Dee Williams is responsible for Navy’s communication and reputation teams, a remit that involves community engagement and developing communication strategies to meet Government outcomes. She spoke to **Lachlan Colquhoun**.

Navy communications is about allowing Australians to see Navy’s capability ashore and afloat. Throughout 2020, the Defence Force has been active in our community in ways many Australians may not have experienced before, and CAPT Williams’ role is to ensure that the story of the Navy’s contribution is told.

During the 2020 bushfire crisis, Navy responded as part of the joint Australian Defence Force Operation Bushfire Assist. HMAS *Choules* and Australian Defence Vessel *Sycamore* assisted 4,000 tourists and citizens of Mallacoota

unable to leave as bushfires had cut off means of support and evacuation. Medical support, technical assistance and Humanitarian and Disaster Relief (HADR) stores were provided before embarking in excess of 1,000 evacuees for transfer to Westernport on the Mornington Peninsula. This evolution was the largest domestic amphibious evacuation in Australia’s history.

The bushfire crisis rightly dominated the news, not just in Australia but around the world. Public Affairs Officers were deployed on ships and at key locations onshore, relaying

information, capturing imagery, collecting content and coordinating media access. CAPT Williams says the team is critical to such high-profile activities.

“Navy communications was responsible for sharing that story with Australians – to give the Australian community a chance to see what Navy does and the capabilities we have.

“It’s our responsibility to champion the stories of the Navy to the Australian people, so that they, in turn, have an understanding of what we do.

“As we all know, the media landscape is constantly changing, with an expectation that organisations are omnipresent across multiple channels,” CAPT Williams says. “The Navy is not exempt from this expectation, and in a media-hungry world of the 24-hour news cycle, it is a priority to ensure we have communication experts, both military and civilian, working together.

“This is achieved through our public affairs team, who act as a conduit, providing imagery and information

from places most members of the public will never go.”

A really powerful example is the footage from HMAS *Canberra*, where the crew recently assisted in locating the three-person crew of a skiff that had been missing for nearly three days in Micronesia.

The men were found on August 2 in good condition on tiny Pikelot Island, 190km west of where they had set off in their seven-metre vessel on July 30.

Their SOS message outlined on a beach was spotted from the air by Australian and US aircraft during the search.

“It was this story, captured by our people, that was shared around the world and provided a poignant example of our capability,” says CAPT Williams.

“Key to our success is our team approach. Navy communications is not just made up of military members but also Australian Public Servants who provide a depth of subject matter expertise. It is this combined use of specialist skills that enables better outcomes for Navy and Defence.”

Another part of CAPT Williams’ role is managing the Navy’s public engagement activities: leading a team of public affairs and communication professionals who inform and promote the Navy’s activities.

“We would like the public to know that we are a highly professional organisation, committed to Australia and our community and the region,” CAPT Williams says, responding to a question on how she would like the Navy to be perceived.

“It’s not always an easy lifestyle in the Navy. There is a lot of personal sacrifice Navy personnel make when they are at sea and ashore, and we rely on our families and friends to support us. This demonstrates we are committed to the community we serve.”

Community Engagement Teams around Australia are involved in many public events where Navy is invited, such as regional shows to rugby and football

games, which also falls into CAPT Williams’ remit.

“You’ll see them doing exhibitions in RHIBs, or we might have some helicopters on display to demonstrate our aviation capability, and it’s an opportunity to talk to people and talk to them about what it’s like in the Navy,” says CAPT Williams.

“These activities are partly about building awareness and pride in the Navy, a chance to share the Navy’s message and show the public what we are about. They are also an opportunity for those who might be interested in pursuing a career in the Navy to find out more.”

“It is saying: ‘Here is our capability and here is what we do. Have a think about our professionalism and pride, and understand what it is that you could do in the Navy.’”

One of CAPT Williams’ favourite areas of the Navy Communication and Coordination division is the Navy band.

“They are an incredibly talented group of musicians,” says CAPT Williams.

“They perform at parades, formal events, on Anzac Day and also smaller engagement programs like visiting schools and retirement homes. They will also deploy overseas and perform in military tattoos, large regional exercises and for the public when we visit a foreign port.

“The band shares our message in a loud and proud way, to let people get to know us through being entertained. It’s a way of extending hospitality and building relationships in a different fashion, in a way which appreciates different cultures through the international engagement activities the band is involved in.”

The Navy band has an active YouTube channel where people can enjoy its performances online, and CAPT Williams says this is an example of how Navy is using new digital engagement channels, a trend enhanced by the disruptions of the COVID-19 pandemic.



Captain Dee Williams

“We are getting much better at coming up with new and innovative ways to engage,” says CAPT Williams. “For example, there are virtual recruitment activities which stream into classrooms to talk to students.”

When the engagement team at HMAS *Albatross* at Nowra was invited to participate in Ulladulla Careers Week, it had to investigate ways to support this activity while still adhering to social distancing requirements.

A photographic display was installed, working with Navy Image Specialists to capture life in the Navy and work with the theme of Ulladulla High School Careers Week, which was “It’s never too young to start exploring”.

“The whole idea was to take Navy to where people are and help them appreciate the service that we offer,” says CAPT Williams.

CAPT Williams also has a role managing internal communication, and she sees this as a key part of maintaining Navy’s organisational effectiveness.

“We are a thinking Navy, a fighting Navy and an Australian Navy. To be a thinking Navy, we have to be sharing information and encouraging discussion around that information,” she says. “We have to be receiving information back, and developing a deep understanding of our mission and the strategic environment we are operating in.” ■

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