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The hull has not been changed for the RAN

ARMY LOOKS TO SOUTH KOREA FOR 155MM SPH
An historic and welcome development

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You should be able to land helicopters on them

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NEWS FROM ACROSS THE TASMAN
Our regular update

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The deadly pandemic has created conditions for many countries similar to that which would occur in the lead up to a major conflict – and Australia’s collective response has been mediocre. We have escaped the worst health consequences as a result of several factors, including some good early decisions, but also as a result of Australia’s geography and the common sense of the vast majority of citizens. This latter quality has been absent in a number of other countries – most notably the US.

However, the economic effects have been severe – and rather than comparing ourselves with the worst performers, to be better prepared it makes more sense to learn from the best. These include: Taiwan; Singapore; and South Korea. None of these countries needed to go into extended lockdown – and while some disruption has occurred, they have all been able to continue with a business as usual approach, which Australia and other parts of the world can only admire.

As various inquiries here continue and more is learned about how NSW dealt with the Ruby Princess and how Victoria managed the hotel situation the emerging picture is one of bureaucratic incompetence and buck passing with memory lapses and blame shifting rife. Many of the politicians have been as uninspiring, with the premiers of Queensland and Western Australia in particular adopting a position of keeping their borders shut indefinitely despite the medical advice. The situation is now improving slightly in that regard but could have been handled better.

There has been no real central coordination, with the National Cabinet a useful forum for exchanging ideas and information, but that has been about it. There is no overall definition of what constitutes a hot spot, or the minimum number of infections necessary before restrictions ease, or agreement on how quarantines and lockdowns need to be enforced. This has been a national emergency, which is crying out for a coordinated national response.

The Federal Government did the right thing initially, imposing tough restrictions on international travel, but after that things have fallen away – though agreements on having access to vaccines is a welcome, if belated, development. There are mixed feelings about Australians stranded overseas, with some people saying of their fellow citizens that they are getting what they deserve and they can stay where they are forever, presumably to become beggars and street criminals to survive in London, Rome and Beirut.

We remind readers that in 2011 as Libya slid into a ghastly civil war – which continues – China took the decision to evacuate all 55,000 of their citizens, many of whom worked in the oil and gas industry. They succeeded. It took six weeks and a mix of ships and aircraft, but they did it. In 2015 at a smaller scale, China evacuated 225 of their citizens from Yemen and as part of the same effort almost 700 foreign nationals were rescued – an act of charity that our “who cares?” brigade would scoff at.

When we suggested in APDR that RAAF assets such as MRTTs could evacuate Australians and then be quarantined on bases such as Laverton, Richmond and Williamtown there was considerable informal pushback to that from within the Defence establishment. Everyone accepted that aircraft could be used, even though this would involve multiple flights to multiple locations, so it would be an administrative and logistic challenge – but it could be done. If Australia were on the verge of a major conflict any responsible Government would do its utmost to evacuate our citizens from the danger zone – or at least one would hope so.

However, the pushback against bypassing the state quarantine arrangements – themselves shambolic and illogical – and housing people on bases was very much of the “dog ate my homework” variety. Excuse 1: rooms on base are not air-conditioned. (True – but that’s a good thing with fresh air being preferred); 2: the rooms only have single beds. (If people want to drag two single beds together that’s fine); 3: bases are insecure and people would wander off them. (Obviously complete nonsense); 4: service people would be at risk. (True. But so are health workers, police and others, but they manage); 5: bases have shared bathrooms and are unsafe. (True – but manageable. Other places with shared facilities include: residential colleges; airports; shopping centres and cinemas; some hospitals and aged care facilities; sporting venues – and so on).

The countries that avoided complete lockdowns reacted quickly and decisively. All incoming airline passengers were temperature screened on arrival, walking past IR detectors. Mandatory quarantine was strictly imposed with heavy financial penalties – but Governments then looked after people with regular care packages and food deliveries. Contact tracing – a key ingredient to success – was thorough and intensive, with each new case in Singapore being immediately assigned a team of five people to very quickly go through their recent history and act accordingly.

Asia learnt from the SARS outbreak of 2003 and the countries that we referred to realised the seriousness of the situation, which could have caused millions of deaths, and put in place systems and procedures that could rapidly respond to crises. The writer witnessed this first hand in Singapore in mid-February when the rest of the western world was just waking up. Even back then strict public safety measures were already in place, with all taxi drivers wearing masks and gloves; many temperature screening points; warnings on the radio, television and online about what was coming, and more.

Australia needs to learn from COVID-19 and to be far better prepared. Defence industry has adapted well to the disruption to global supply chains that would also occur in the event of a major conflict. The approach of the Federal and State governments has been far less impressive. This should be seen as an opportunity to learn and improve in the national interest.
Hanwha’s fighting vehicle experience is directly applicable to Land 400 Phase 3

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TO BE MADE IN GEELONG
Creating a self-reliant armoured vehicle industry
A DART rocket carrying a Defence payload has launched today from Koonibba Rocket Range in South Australia, marking the first commercial rocket launch to the edge of space from Australia.

At just 3.4 metres long and weighing 34 kilograms, the DART rocket is a fraction of the size of rockets launched by NASA and SpaceX.

Minister for Defence, Senator the Hon Linda Reynolds CSC said space was an increasingly important domain, which is why the Government is investing $7 billion over the next decade in space capabilities as part of the 2020 Defence Strategic Update and Force Structure Plan.

"The rocket will carry a prototype radio frequency receiver unit designed for Air Force.

"The payload, carried on a DART rocket, provides a stepping stone for Air Force to explore how advanced rapidly deployable networked sensors can be employed to provide information across Defence networks," Minister Reynolds said.

"Air Force’s Plan Jericho has sponsored this prototype, developed by DEWC Systems, and marks an exciting future for Australia’s space capability."

"As space is becoming more congested and contested, the Government is investing $7 billion over the next decade in space capabilities as part of the 2020 Defence Strategic Update and 2020 Force Structure Plan.

Minister for Defence Industry Melissa Price said the DART rocket launch is a partnership between Government and industry, demonstrating future opportunities for both commercial and government applications.

"Air Force’s advanced sensing capability is being enhanced by working with leading Australian industry partners, Southern Launch, DEWC Systems, and Dutch company, T-Minus Engineering," Minister Price said.

"The rocket is unlike any rocket ever launched in Australia, and is part of what is known as ‘New Space’ technologies – small rockets carrying reduced sized satellites using commercially available technologies“.

The rocket launch forms part of Air Force’s Plan Jericho advanced sensing program to detect and track challenging targets. The program also includes high altitude balloon launches.

The launch of the DART rocket from the Koonibba Rocket Range is being done in consultation with the local Aboriginal community, and marks the start of commercial space launches from South Australia.

PALAU RECEIVES GUARDIAN-CLASS PATROL BOAT
– 18 September 2020 –

Australia is stepping up in the Pacific and continuing to deepen our engagement with our regional partners during COVID-19 with the handover of a new Guardian-class Patrol Boat to the Republic of Palau.

The vessel, PSS President HI Remeliik II, was received by Palauan Commanding Officer Lieutenant Commander Emerson Nobuo at a COVID-safe ceremony in Henderson, Western Australia, celebrating the latest milestone under the Pacific Maritime Security Program.

Minister for Defence, Senator the Hon Linda Reynolds CSC said space was an increasingly important domain, which is why the Government is investing $7 billion over the next decade in space capabilities as part of the 2020 Defence Strategic Update and Force Structure Plan.

"The crew’s commitment to the training program with our Navy personnel and our industry partners at Austal has been exceptional, and we are proud to host them here in Australia."

Assistant Defence Minister and Minister for International Development and the Pacific, the Hon Alex Hawke MP said the Guardian-class Patrol Boats make an important contribution to regional security.

"The Palau vessel is the seventh Guardian-class Patrol Boat delivered to our Pacific partners under the Pacific Maritime Security Program," Minister Hawke said.

"This Program, which is the successor to the Pacific Patrol Boat Program, proudly continues a 60 year commitment to the Pacific and to regional maritime security."

Minister for Defence Industry, Melissa Price said she was pleased to represent the Australian Government at today’s handover to see how the Pacific Maritime Security Program also supported Australia’s defence industry.

"Construction of the patrol boats in Perth demonstrates that manufacturing is alive and well in Australia, with work at Austal Australia supporting some 400 direct and indirect local jobs,” Minister Price said.

“Defence industry projects like this one are a great jobs success story and provides a reminder of the importance of the role that such companies play in supporting both our economy and defence capability.”
Loitering Munitions - Meeting the Challenge of Time-Sensitive Targets

In modern battlefields, spotting the enemy in time and acting on real-time information has become a critical capability. The precise location of the enemy in modern combat is not always known, even if the general area of their activities is.

Persistent surveillance of a broad area, timely detection, and quick engagement of the enemy, immediately upon a target appearance are imperative to dominate the modern battlespace. Such missions are the specialty of Israel Aerospace Industries (IAI) loitering munitions.

These weapons are designed to operate in complex arenas and to detect moving targets on foot or in a vehicle immediately. Having a loitering munition in the sky with the right sensors is the most efficient way to deal with such adversaries.

IAI’s family of loitering munitions is the ideal match for the time-critical, elusive, and evasive fleeting enemy targets of the modern battlefield. These loitering munitions resemble an alert hunter on the prowl, patiently watches, and waits for its target to reveal itself, then pounces just at the right time.

Loitering munitions can stay in the relevant area of combat operations for an extended time, and use sensitive electro-optic or anti-radiation sensors to cover and acquire an entire area in which enemy activity is known to be happening.

Ground forces can operate loitering munitions from a distance, further back behind the frontline, or operate them on the frontline, using portable tablet-based controls.

A Legacy of Loitering Munitions

In the 1980s, IAI pioneered the loitering munitions field with its development of the Harpy platform, as a method to overcome intelligence gaps on enemy activity.

Later, the larger Harop platform was born. In recent years, IAI has continued to act as a trailblazer in the area, introducing several loitering platforms that serve the tactical level.

Among others these include the electrically-powered Mini Harpy, equipped with dual-homing capabilities - utilizing anti-radiation and electro-optical seekers.

Weighing 40 kilograms, the Mini Harpy is vehicle-lunched, like the Harop. With a broadened capability spectrum, Mini Harpy can utilize all sensors simultaneously. By employing the radiation-sensors, day, and night electro-optics sensors at the same time, Mini Harpy enables the user to cover broader areas, and look for targets more effectively, rather than searching for them through a straw. With the anti-radiation sensor cueing the camera on-board. The Mini Harpy carries a warhead with eight kilograms of explosives. It can strike targets within one-meter accuracy. Its operating range is 100 kilometers, enabling ground units to extend operations deeper into a hostile area or employ offensive weapons from far back if needed.

IAI’s Rotem quadcopter munition is the second tactical loitering solution offered by IAI, designed for employment by the ground forces and the individual soldier at the small unit level. With a range of 10 kilometers, it is relevant for units up to the battalion level.

Lightweight, compact, and affordable, Rotem enables individual soldiers to put eyes in the sky over the next hill, beyond the line of sight, and strike the enemy as soon as targets appear.

The Rotem provides tactical field units with a new advantage against adversaries. If it does not receive an attack authorization, the Rotem can fly back and be retrieved safely, have its battery replaced, and immediately deploy on a new mission. It carries electro-optical day and night sensors.

IAI’s loitering munitions don’t just hover in the sky. Like alert hunters, they ensure that ground forces are monitoring the right area, waiting to detect and pounce on targets as soon as they appear. By empowering the tactical and operational level, Loitering munitions enable ground forces and special operations elements to arrive at the battlefield with game-changing advantage, by overcoming intelligence gaps and dealing effectively with the elusive ‘disappearing enemy.’
The agreements with Ronson Gears reinforce Lockheed Martin’s commitment to developing Australia’s Space sector,” said Joe North, Lockheed Martin Australia Chief Executive. Our collaboration with local research and industry partners, like Ronson, demonstrates that Australia has the capabilities here and now to participate in Space.”

**Exceeding Qualification Requirements**
As one would expect, Lockheed Martin follows a rigorous qualification process to ensure gold standard manufacturing practices. It’s critical that the components it uses are designed to withstand the extreme environment of Space. Ronson Gears has met these standards and has proven its ability to maintain precision over the lifetime of the spacecraft.

“Coming from the automotive industry, it was important that we prioritise innovation and invest in digital technologies that could enhance precision across our production processes – especially for a Space environment,” commented Gavin New, General Manager, Ronson Gears. “From our first introduction, Lockheed Martin has been collaborative and supported our vision. We’re proud to be the first Australian company to supply precision gear components that will be carried into space.”

Additionally, Gavin New is the most recent graduate of Lockheed Martin’s Program Management Institute (PMI), with Australia being the only non-United States market approved for non-Lockheed Martin employees to attend.

**Expanding Global Supply Chains**
Because of the pioneering work that companies like Ronson Gears have accomplished, Lockheed Martin Space procurement teams are continually scanning Australia to identify potential technology partners for its global supply chains. This includes everything from machined parts to software and even propulsion technologies.

“The Global Supply Chain (GSC) Program is uniquely Australian and provides the local market with access to Lockheed Martin’s global programs. We’re continuously identifying new opportunities for Ronson Gears to contribute to our missions, and applaud their dedication to supporting innovative initiatives such as IoT technologies,” added Christopher Hess, Head of Industrial Development, Lockheed Martin Australia.

These agreements also represent downstream supply chain opportunities for Ronson Gears’ partners, including Heat Treatment Australia and Electromold Australia. Their hardening processes and magnetic particle inspection, respectively, are evidence of the world-class capabilities available in Australia to the Space industry.

**SAAB RECEIVES ORDER FOR DEPLOYABLE HEALTH TO AUSTRALIA**
Saab has signed a contract with the Australian Department of Defence to deliver deployable health modules for the Australian Government’s Deployable Health Capability Program, Joint Project 2060. The order value is 337 MAUD (2,150 MSEK) for the years 2020-2027, including 5 years of support.

Saab has partnered with Aspen Medical, Philips Healthcare Australia & NZ, Broadspectrum and Marshall Land Systems to deliver more than 550 deployable medical modules.

“Saab is a strategic and long-term partner for Australian Defence and as a result of this contract, we will relocate our global deployable health centre of excellence from Sweden to Australia,” says Andy Keough, Managing Director at Saab Australia.

Saab delivers health modules which includes a surgical theatre, mobile computed tomography (CT) scanner, x-ray and ultrasound equipment along with trauma, intensive care and ward units and can be ready for national or international deployment within 24hours.

The program will ultimately see a purpose-built warehouse located in South East Queensland to meet the storage, training and maintenance requirements.

**STRENGTHENING HOW DEFENCE DOES BUSINESS WITH AUSTRALIAN INDUSTRY**
– 18 September 2020 –
The Morrison Government is strengthening Australian Industry Capability (AIC) and refining the way Defence does business with industry.

Minister for Defence, Senator the Hon Linda Reynolds CSC, and Minister for Defence Industry, Melissa Price, today announced the Government will implement significant improvements to the AIC Program so that opportunities for Australian industry are front and centre of Defence decision-making.

The Australian Standard for Defence Contracting

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**LOCKHEED MARTIN**

**SHOOTS FOR THE STARS WITH LOCKHEED MARTIN**

– MELBOURNE, 14 September 2020 –
In the last year, Lockheed Martin (NYSE: LMT) has signed five contracts with Ronson Gears under its Global Supply Chain (GSC) Program agreement with the Commonwealth. This makes the gear manufacturer the first-ever Australian company to supply precision gear components that will be carried into space.

Melbourne-based Ronson Gears is providing prototype gears for the Common Solar Array Drive Assembly (CSADA), which will be utilised on several Lockheed Martin satellite platforms. The CSADA performs key functions, including the deployment and rotation of the solar cell arrays that power the spacecraft. This helps ensure they remain optimally positioned towards the Sun.

Additionally, Ronson has also been awarded a contract for the delivery of anti-backlash output gears. Designed to perform with tight tolerances, these components will be integrated into a subassembly that will be used on several satellite programs.
ASDEFCON will also undergo a major revamp to cut process times and costs for Australian businesses.

Minister Reynolds said a genuine partnership with Defence and industry was critical to ensuring our industrial base effectively supports Australia’s national security, as reinforced in the 2020 Defence Strategic Update.

“Defence will strengthen the requirements for AIC in Defence contracts through additional contractual and non-contractual measures and will consult with industry on these changes over the coming months,” Minister Reynolds said.

The delivery of new AIC provisions in future contracts, creation of an Independent AIC Plan Audit Program, recent changes to Commonwealth Procurement Rules guidelines and an overhaul of the CDIC will significantly improve opportunities, protections and support for Australian businesses seeking to enter the Defence sector or looking to expand their footprint with Defence.

“The Morrison Government is committed to maximising opportunities for Australian business to be involved in Defence procurement and to building a competitive Australian industry to equip and sustain the Australian Defence Force,” Minister Reynolds said.

“Large companies will know that the Government expects them to honour their AIC commitments, and small businesses know the Government has their backs.

“Additional AIC provisions in future contracts will require companies to make specific and measurable commitments.

“Independent audit firms will then ensure large Defence companies are meeting their contracted Australian industry commitments.

“This will provide an additional level of confidence for Australian businesses.”

Defence will consult with industry over several months on the changes to AIC contractual requirements before the new contractual provisions begin to be implemented from 1 January 2021.

Minister Price said the latest changes represented the culmination of a major new ‘five-pillars’ approach to supporting defence industry in Australia.

“The pillars of the AIC contractual framework and ASDEFCON review build on the work of our CDIC reforms, the Independent AIC Plan Audit Program and more support for defence industry in the guidelines to the Commonwealth Procurement Rules,” Minister Price said.

“Small businesses are the backbone of the Australian economy and need to be treated accordingly during Defence’s decision-making process.

“Backing small business has been my number one priority and we have delivered on the promised changes to enhance the AIC Program in Defence.

“The delivery of an Independent AIC Plan Audit Program and improving how we contract for AIC in our major programs are the next big steps needed to create more opportunities for Australian businesses in Defence programs.”

The review of ASDEFCON, to be overseen by Minister Price, will aim to simplify and streamline contracting and subcontracting templates and remove unnecessary complexities that create additional burden on Australian businesses.

Minister Price said the Terms of Reference to remove the barriers in ASDEFCON and the consultation process will be finalised and released in November 2020.

“Ultimately, the renewed ASDEFCON template suite and processes are aimed at reducing avoidable cost, time and process complexity,” Minister Price said.

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VESTDAVIT WINS CONTRACT TO SUPPLY SIX AUSTRALIAN NAVY PATROL BOAT

– 22 September 2020 –

Leading davit supplier Vestdavit has secured an agreement with Austal Australia to deliver twelve boat launch-and-recovery systems for the Royal Australian Navy (RAN). The marine davits will be installed on six new Cape-class patrol boats (CCPBs), under construction for the Navy at Austal’s Henderson shipyard in Western Australia.

Joining the combined RAN and Australian Border Force fleet of 10 CCPBs, the cutting-edge vessels will enhance Australia’s border protection capabilities, supporting a wide range of security missions at a critical time for the country. They will feature Vestdavit’s PLAR-6501 single-point telescopic davit, an upgrade on the PLAR-6500 deployed on the existing patrol boats and a higher-capacity cousin of the PLAR-4501 delivered to the Trinidad and Tobago Coast Guard earlier this year.

The PLAR-6501, like the 4501, has been designed according to new standard DNVGL-ST-0498 for safer and more efficient boat handling. In addition to minimising weight, the PLAR 6501’s aluminium structure protects against corrosion; a fatigue analysis carried out during the DNV GL certification process indicates an extended lifespan.

“The 6501 is the latest and highest-capacity PLAR model to conform to DNV GL standards, making it part of a new generation of A-frame davit,” explains Vestdavit Sales and Business Development Director Bjørnar Dahle. “It is light, compact and robust, offering unparalleled performance without affecting the stability and manoeuvrability of vessels. It is therefore the ideal boat-handling system for the varied and challenging operations of navies and coast guards.”

The new davit system – designed for the launch and recovery of man-overboard and fast-rescue craft – comes equipped with dynamic shock absorber and hydraulic boat-guiding arms to ensure the safety of crew above sea state 4.

For Vestdavit, this is the most recent in a series of agreements to supply international naval organisations. This year alone, the Bergen-based company has delivered its boat-handling systems to the United States Navy, the Royal Navy and the French Navy, as well as to the Trinidad and Tobago Coast Guard.

“2020 has been a particularly busy year for us in terms of our involvement with naval organisations,” says Dahle. “With governments investing heavily in border protection, Vestdavit’s technology, manufacturing quality and service support is persuading navies to opt for our premium-grade davits, but we also need to acknowledge Austal for its ongoing cooperation. Over the years, we have delivered more than 60 davits to Austal yards, and there is no doubt that this long-standing relationship has been a key factor in our continuing success in the naval segment.”
IGNORE THE RUMOURS – THE HUNTER CLASS FRIGATES ARE STILL THE SAME SIZE

No major defence project in recent history has been without its moments of controversy and now it has been the turn of BAE Systems and the Hunter class future frigate. The criticisms from sections of the media – not APDR – have been in two distinct areas. The first one is that the Type 26 Global Combat Ship reference design has had to undergo major changes because it is too small to handle all of the Australian-specific requirements. The second criticism is that the company’s AIC program is not as initially promised – particularly for the first three ships currently under contract.

SHIP SIZE AND DESIGN PROCESS
On the first point, a Defence spokesperson was clear:

“The length and beam of the Hunter class frigate remain the same as the Type 26 reference ship design.”

As has been known all along, the superstructure is the area of significant change with Australia’s CEAFAR radar suite requiring major changes above the waterline. Other changes are driven by the fact that the RAN uses a different embarked helicopter than the RN, requiring some but not radical changes to the hangar. Also the RAN uses a suite of missiles in common with the USN – particularly the Standard Missile family – while the RN has gone down the European path with Aster. This has also necessitated a departure from the Type 26 baseline. Thankfully the reference design has quite a substantial margin and the increased top weight of the Australian variant might actually benefit some sea keeping characteristics.

For a more in depth look at the situation, we spoke with ASC Managing Director Craig Lockhart, who outlined the design process:

“There is a lot of interest in the design of the Hunter and it is important to note that we are very deep in the process. Hunter is being designed to meet the specifications our Navy requires, from weight, to speed, to stealth, and much, much more. ASC Shipbuilding is using the UK’s Type 26 Global Combat Ship as a reference design, to deliver a very specific capability for the Royal Australian Navy.

“While there are a lot of similarities, the Australian frigate was always going to be different to Type 26 because the “fight and flight” requirements are different. Hunter’s platform, operating system and anti-submarine warfare capability will be the same as Type 26, but its combat system elements are different.

“The Global Combat Ship is a configurable modern warship, and that’s why it was selected by the Canadian Navy as well. Each of the three variants will have different capability, to meet their own Navy’s requirements, and commonality across the platform. “Australia’s new frigates will be a different ship in many regards with capabilities such as the Australian-made CEA radar, a deck to accommodate the Romeo helicopter, and the AEGIS combat system currently being incorporated into the design. As our understanding of the Australian capability requirements improves, these will all feed into the whole ship stability assessment - which is a key feature of the Systems Definition Requirements (SDR) planned for March next year. It is from this assessment that we will consider any hull characteristics.

“Hundreds of engineers are today working to develop the Hunter class design, and thousands will be involved in building nine of these anti-submarine warfare frigates here in Australia. Together with these very capable individuals, I am confident that we will produce a ship that meets the high performance and capability requirements of the Royal Australian Navy.

“Kym, it’s also important to note that we are still some way from having a final design for the first batch of three ships. We’re working through the usual naval design process, defining the systems and requirements, undertaking the spatial design and then the detail design before going into production.”

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AIC is one of those hot button issues that makes politicians particularly twitchy because if they are spending billions of dollars – and in this case tens of billions of dollars – on defence technology then they had better have something to show for it in terms of local jobs. However, for an overseas product, the more rapid the acquisition, the less are the opportunities for local content. The logic is fairly straightforward: if it needs to be done as rapidly as possible, the prime contractor has little choice but to use their existing supply line rather than develop an Australian one.

For a major contract, the timeline for the Hunter class is very quick – but not brutally so. This is driven largely by Australia’s deteriorating strategic circumstances and a strong desire to have these hugely capable warships becoming available before the end of the decade. If Australian naval shipbuilding had been rationally set up in the 1980s we would already have had a rolling construction program and life would be much easier – but there was a drought of work when construction of the Collins submarines, Anzac frigates and coastal mine hunters all ended in the early 2000s. This was followed by a second “Valley of Death” that was narrowly averted – but which still had a significant impact – when work on the Air Warfare Destroyers started to wind down from the middle of last decade.

With this background, APDR put it to Defence that the aggressive timetable for SEA 5000 makes it more difficult for Australian companies to win work in the earlier parts of the build. The response, which seems to confirm this, is:

“Given the priority Government put on minimising the gap between the end of the Hobart class destroyer build and the commencement of Hunter, the first batch of Hunter class frigates will use the United Kingdom’s Type 26 reference ship suppliers for the acquisition of major platform systems. This will also mitigate the schedule risk to meet the cut steel milestone for ship 1 by the end of 2022.

“For the Batch One ships, each major system provider is required to deliver an AIC Plan to ASC Shipbuilding. This will be the system provider’s commitment to Australian content for Batch One procurement for their system. The Australian changes include significant Australian content such as the Saab Australia developed Australian Tactical Interface and the CEA Technologies CEAFAR radar. For the batch two and three ships, ASC Shipbuilding has committed to scoping Australian industry participation in major systems and subsystems prior to commencing procurement activities.

“ASC Shipbuilding is implementing a strategy to maximise nationwide opportunities for Australian Industry. The strategy will provide opportunities for small to medium Australian suppliers in the build and sustainment phases and will explore opportunities to integrate Australian suppliers into their global supply chain.”

Craig Lockhart also provided the company’s perspective:

“Kym, we’re committed and are contracted to maximising AIC over the life of the program. Our strategy for delivering AIC over the life of the program is one that we are confident can be achieved, and is designed to deliver over time the exact type of capability that is necessary for Australia to develop an enduring sovereign shipbuilding industry.

“At this point in time, there are a number of cases where specific equipment or systems required for the Hunter Class are not currently designed or manufactured or produced in Australia.

“In these cases we and the Commonwealth have decided to appoint suppliers to the first batch of ships that, while not Australian, can deliver the capability that is required first and foremost, to avoid putting the schedule at risk. It is also important that we work with the Commonwealth on delivering maximum value from AIC not only in dollars spent but support a spiral development of strategic capabilities that will drive long-term benefit in emergent technologies and thus support Hunter as a leading edge platform over its entire design and build life.

“In the cases where an Australian company has not been appointed, we have instructed the original equipment manufacturers to develop plans to maximise the use of Australian industry in the
design, manufacture, testing and installation of their equipment and systems during Batch 1.

“If an Australian company is not involved in Batch 1, it does not mean they will not be involved on Batches 2 or 3. As you know, the Hunter-class design will evolve between batches, with increasing opportunities for Australian major system and equipment providers.

“That’s why we’ll be working through Batch 1 to maximise Australian industry involvement with our OEMs, and looking at ways to transfer some of those major systems and equipment to Australia in subsequent batches – provided the performance characteristics, schedule and budget can be adhered to. In addition to growing opportunities for Australian companies with our original equipment manufacturers, we have recently placed a number of contracts for the program’s prototyping phase, which will commence at the end of the year as planned.

“In the coming weeks and months we will award more contracts to Australian businesses for materials and services required for prototyping. We are currently ahead of our contractual targets for delivering AIC but that does not mean we are still not pursuing every opportunity to bring more benefit to the Australian economy through the Hunter program.”

He explained that the frigates are designed in 12 zones. Of these, eight are below the main deck and are colloquially referred to as the “float and move” parts of the ship – so the main gas turbines, generators, propellers, gearboxes, pumps, fuel, stores and so on. The Australian ships require low to moderate amounts of change in all of these areas. This part of the ship also houses the critical underwater warfare suite, the principle sensor elements of which are a hull mounted sonar from Ultra and a hugely capable, variable depth active / passive sonar from Thales that was only available with the Type 26 design and required British Government export approval given the sensitive nature of the technology. These companies are already well established in Australia – particularly Thales – and it is expected that they will achieve high levels of AIC.

Of the remaining four zones, the three that will house the Australian combat system will require major changes. The final section – the distinctive radar mast – will be a new design. Craig Lockhart summarised:

“It is likely that all design zones will have a level of change, such as changing British power sockets to the Australian standard but what we are interested at this stage is changes that may drive structural considerations or increase integration complexity so that we can better understand the impact on whole ship performance.

“Importantly, this design work is being done within the agreed seakeeping and performance criteria such as weight and space envelopes.”

RADAR AND COMBAT SYSTEM

This is an area where, almost paradoxically, there is a huge amount of Australian content. That is because traditionally it was relatively easy to weld metal and bend pipes, but considerably more difficult to supply the advanced electronics and software that are integral to modern combat systems. However, because of advances made by companies such as CEA technologies, Saab Australia, Lockheed Martin Australia and Raytheon Australia, we have a wealth of talent in this field, which individually and collectively are at the leading edge of military technology.

For the Hunter class frigates, the principle above-water sensor is the enormously capable CEAFAR radar suite, a fully digital active phased array radar that is world beating technology. At ranges that are classified, it is able to detect, track and classify hundreds of targets and then assign and control outgoing defensive missiles such as SM-2 and ESSM to protect the ship against threats such as multiple supersonic sea skimming missiles.

The suite is being supplied to BAE Systems as Government Furnished Equipment (GFE) and the company itself did not wish to comment on progress being made on SEA 5000. However, the customer – Defence – reminded us that the CEAFAR radar system destined for the Hunter class frigate is based on the CEA technology fielded in the Anzac class frigates under Project SEA1448 Phase 4B. This technology was recently demonstrated on-board HMAS Arunta during the Rim of the Pacific Exercise (RIMPAC) 2020. Integration of the CEAFAR radar system and the Aegis combat system, including interface development, simulation and software code prototyping, will continue for the next 24 months.

PROGRESS ON THE TYPE 26 GLOBAL COMBAT SHIP

One of the many factors behind the success of the BAE Systems proposal – backed by the UK Government – was the relative maturity of the design. Critics might point out that the other two bidders were offering ships that were already in the water in the form of the Italian FREMM and the Australian Air Warfare Destroyer. However, the Type 26 is approximately four years ahead of Australia and allows us – as a RN Rear Admiral put it – to slipstream behind the UK effort. If any major problems are revealed during construction of the first of class, or even during sea trials, there is still time for any required changes to flow through to Australia so that they can be incorporated during our build phase.

It is therefore no surprise that Australia is very closely watching progress on the parent contract. Defence says that all blocks of the first Type 26 have been completed or are under construction with more than half erected. Work has also begun on the 2nd of class, with a fifth of the ship erected. To observe and learn from the Type 26 program, Defence has a small ‘Resident Project Team’ co-located with the project in Glasgow, Scotland, and one exchange naval officer posted directly to the Type 26 project office. ASC Shipbuilding has a number of Australian personnel also located in Glasgow working on the Hunter class frigate project.
ARMY LOOKS TO SOUTH KOREA FOR NEXT GENERATION SELF-PROPELLED HOWITZERS

It is not often that genuine pleasure derives from the writing of an article – particularly when the subject is an inanimate object designed to produce lethal effects – yet here we are. APDR has been tracking this matter for more than a decade and finally on September 3, Defence Minister Linda Reynolds announced that a sole source Request for Tender would be issued to Hanwha for the supply of 30 tracked 155mm ‘Huntsman’ SPHs and 15 armoured resupply vehicles built on the same chassis.

This is an historic first with the ADF selecting a supplier from the Asian region for a major long-term contract that will add greatly to Army’s combat power. There have been some previous attempts to look beyond Australia’s traditional supply base of the US; Europe and Israel – but not many. This decision might be the start of a broader trend that could have major consequences for where Australia looks to for technology partners.

Now Hanwha has succeeded after a long and sustained effort. They have been chosen because they have designed and built the western world’s best SPH – and it is no coincidence that they have sold the K-9 to: Turkey; Norway; Poland (with a British turret); Finland; the fierce and warlike Estonians – all NATO countries – as well as India. Potential customers are the UK, Egypt and even the US.

155mm SPHs are able to deliver a devastating and sustained volume of fire with the crew remaining under armour throughout the mission, including resupply in the field. SPHs are able to deliver a devastating and sustained volume of fire with the crew remaining under armour throughout the mission, including resupply in the field.

"Defence is delivering on the Government’s commitment to build 30 self-propelled howitzers under project LAND 8116 Phase 1 – Protected Mobile Fires, with the release of a Request for Tender in September 2020. The Request for Tender seeks Hanwha’s proposal to build and maintain the Self-Propelled Howitzers, 15 K-10 Armoured Ammunition Resupply Vehicles and their supporting systems in the Geelong region.

Hanwha Defence Australia will submit its response to the Request for Tender in early 2021. Defence will evaluate the Tender before entering into collaborative negotiations with Hanwha. These negotiations will form the basis of Defence’s Second Pass submission, which is currently scheduled to be considered by Government in early 2022. Contract signature will occur following negotiations and Second Pass approval.

“Once a contract is signed, the important work of delivering the capability will commence in 2022-23, which will bring economic growth and job opportunities to the greater region of Geelong. Phase 1 will see the development of a sovereign Protected Mobile Fires industry in Geelong for the manufacture and deep maintenance of the Self-Propelled Howitzer and Armoured Ammunition Resupply Vehicle. This will include building a factory in the Geelong region, training a workforce to build and maintain the platforms, establishing a national and global supply chain, and building with advanced projectiles using rocket assistance that distance can be doubled.

We asked Defence to update the timetable, the build strategy and the future phases of the project:

“Defence is delivering on the Government’s May 2019 commitment to build 30 self-propelled howitzers under project LAND 8116 Phase 1 – Protected Mobile Fires, with the release of a Request for Tender in September 2020. The Request for Tender seeks Hanwha’s proposal to build and maintain the Self-Propelled Howitzers, 15 K-10 Armoured Ammunition Resupply Vehicles and their supporting systems in the Geelong region.

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“Phase 2 of LAND 8116 will deliver an additional Regiment of Protected Mobile Fires, ensuring continuous manufacture in Geelong into the next decade, with support and maintenance opportunities for Australian industry extending beyond 2050. LAND 8116 Phase 3 is anticipated to commence in the late 2030’s and will deliver a mid-life upgrade that will provide an opportunity to incorporate emerging technologies. Both Phases 2 and 3 are at an early stage of consideration. Defence will conduct capability development and analysis work to recommend suitable suppliers, and an acquisition and sustainment strategy for Government consideration.

“Army’s current requirement includes the integration of the in-service M-Series ammunition used by Defence and its key allies, as well as the Assegai family of munitions currently being...
integrated into the M777 under project LAND 17 Phase 1C.2 (Future Artillery Ammunition)."

The offer to maximise Australian involvement in the project worked to Hanwha’s advantage – and the company is planning to use this to leverage Australian firms into Korean supply chains, for both domestic and international sales. The parent Hanwha is a high technology industrial giant with a turnover approaching $100 billion and just their efforts alone bring a lot of horsepower to the task of boosting Australian manufactured exports.

In the past we have provided a lot of technical detail about the 47 tonne SPHs themselves – but for accurate targeting they also need a high-quality Fire Control System (FCS). The offer for Australia is based on the solution for Norway and that includes the company Kongsberg, which is already a significant supplier to the ADF – and good corporate citizen. Asked about their FCS and their willingness to contribute to Australian sovereign capability, the company said:

“Kongsberg Defence Australia intends to build the computer hardware and cables in Australia, and Kongsberg Defence and Aerospace will conduct a complete technical transfer of the CORTEX software to Kongsberg Defence Australia to allow for its ongoing development, support and maintenance in Australia. The resultant new software team will also support other software activities and projects being undertaken by Kongsberg in Australia.

“This undertaking will establish new advanced technology jobs, provide further opportunities for Australian companies in Kongsberg’s global supply chain, and will generate a comprehensive sovereign capability to support the Protected Mobile Fires capability through Life of Type. In addition, it will meet the intent of the recently released Sovereign Industrial Capability Priority Implementation Plan: Land combat protected vehicles and technology upgrades.”

In a relatively short period of time, Australia will have a centre of excellence in the Geelong area not only producing a series of Self-Propelled Howitzers that will be central to Army’s firepower capabilities for decades to come, we will also be developing related technologies – many with export potential. If Hanwha also succeeds in winning LAND 400 Phase 3 with the Redback IFV it will only add to the momentum of far greater engagement with South Korea, which is one of the world’s most vibrant medium sized economies.

To conclude on the international dimension of the SPH decision: until the mid-1990s Australia had not purchased a single major piece of defence technology from Israel. The breakthrough occurred when Elta were selected to supply the ESM system for the upgrade of RAAF’s P-3C maritime patrol aircraft. This was done partially to show the US that if they were not prepared to supply us with what we wanted then we were prepared in the national interest to negotiate with other parties. Just as Israel is now a trusted partner for many advanced products, Hanwha might have opened the door for suppliers from Asia.
However, there are a number of areas where the performance of the ships could be considerably improved at modest cost and no real danger to schedule. As history teaches us, making changes during the design stage is preferable, but even doing so during construction is still easier and far less expensive than upgrading the completed platform later in its life.

In no area is this more important than strengthening the large rear deck of the ships so that RAN helicopters can land on them. In a decision that verges on the bizarre, Defence has changed the original design of the OPVs, removing strengthening from that area so that they now cannot support a helicopter landing.

When APDR has previously pointed this out the reaction from readers has been one of disbelief: why would the RAN want to make the ships less capable than the parent design – especially in a critical capability such as helicopter operations.

Defence reasoned: “Navy intends to deploy maritime unmanned aerial vessels on the Arafura Class OPV as operational requirements and system availability dictate. There are no current plans or intentions to deploy helicopters to, or operate helicopters from, the Arafura Class OPV.”

Just to restate that in another way: during the expected 40 year life of the ships, the RAN cannot foresee the need to ever land a helicopter on them. Not even once. With all due respect, this is just completely crazy. Even in peacetime there are any number of credible contingencies – such as medical evacuations and deliveries of supplies – where it will make life easier for everyone if a helicopter can rest on the deck rather than have to hover and winch things up and down.

To make the situation even stranger, removing the strengthening for the deck was only a very minor cost saving – in exchange for a major loss of capability. The reference design is the Darussalam-class offshore patrol vessel, four of which have been built for Brunei. Naval helicopters can land on all of them.

This deficiency needs to be remedied as soon as possible.

This video shows what can be done with a helicopter landing on a Danish patrol ship of 1,720 tonnes – slightly smaller than an Arafura – in rough conditions: https://www.youtube.com/watch?v=NJZTL2ZyEw

Other commentators have noted that the ships are relatively lightly armed, with Defence confirming: “The Arafura Class OPV will be fitted with a 40mm Leonardo Marlin 40 main gun and two 12.7mm machine guns. Whilst there is no current plan or intention to increase the armament of the OPVs, Navy capability planners assess emerging threats and technologies and will consider adjustments to weapon and sensor suites if the strategic environment requires change.”

While it is relatively easy to add on canister launched missiles, it still makes sense for these potential changes to be incorporated – if possible – during the design and construction phase of the project. The ANZAC ships were built using a “fitted for, but not with” philosophy that subsequently made it easier to install things such a Phalanx 20mm close in weapon system and second fire control radar.

To give a couple of examples: the Norwegian company Kongsberg – already well established in Australia – has developed the next generation of naval surface-to-surface missiles. Designed to replace the venerable Harpoon family and with the exciting marketing name of the Naval Strike Missile, it is a strong contender to equip the Hunter class future frigates. There is no logical reason why these canister-launched weapons could not also equip the OPVs, giving them an enormous increase in deterrent power.

On the fundamentals, each NSM – which also has a ground-launched variant – typically flies at just under the speed of sound with a total weight of 407kg, of which the warhead is the equivalent...
of 100kg of TNT. Already in service in Norway and, more importantly, the USN, it has a range in excess of 200km. It is extremely maneuverable and has a high resolution infra red seeker, which combined with an inertial navigation system allows it to find targets with extreme accuracy even in greatly degraded conditions. A fleet of OPVs carrying two canisters with four NSMs each would be a formidable addition to the RAN.

For air defence, there are also a number of containerised solutions available. The RNZN has decided to equip their upgraded Anzac frigates with MBDA’s CAMM family and as a consequence has exited the ESSM consortium. This has also freed up a lot of space and weight by allowing the removal of the Mk 41 vertical launch cells from the ships. In its maritime variant, this missile is known as the Sea Ceptor – and it is an all-weather air defence missile with a range in excess of 25km. All up, each one weighs 99kg and also has a “soft launch” feature, meaning that it is ejected from its canister before the rocket motor fires, making them suitable for OPVs such as the Arafura class. Another potential solution would be the Barak interceptor from IAI, which comes in a lightweight extremely compact 8-cell vertical launch system designed for small ships.

Another good thing about NSM, Sea Ceptor and Barak is that they are compatible with the ship’s existing sensors – and especially with Saab’s highly capable 9LV combat management system. There is plenty of real estate available on the Arafura’s and for what would seem to be a modest investment would give these platforms a surface strike capability – including against land targets – and an effective air defence system as well.

If they were also made helicopter capable, this combined package would transform a benign OPV into something considerably more formidable. As Marcus Hellyer at the Australian Strategic Policy Institute (ASPI) has recommended – keep building these ships as a way of dramatically increasing the RAN’s surface fleet with a large number of advanced platforms while we wait for projects such as SEA 5000 to deliver the goods.

There is no reason why the RAN could not be expanded to operate 18 or even 24 of them. With current and future networking capabilities, they would be a powerful part of a combined surface fleet. In the event of serious hostilities, Australia will need as many platforms as we can get. As miniaturisation in electronics is proving, even relatively small platforms such as an 1,800 tonne OPV can be made highly capable.

Of course it needs motivation for such changes to occur. The services are typically reluctant to introduce new missiles into the inventory because that is a lot of new documentation, they have to be stored safely, monitored, transported to where they are needed and so on. Despite this increased administrative and logistics burden now is a good time to be looking at solutions that some might consider unorthodox.

In a decision that verges on the bizarre, Defence has changed the original design of the OPVs, removing strengthening from that area so that they now cannot support a helicopter landing.
These were successfully completed and indicated an expansion of the previous aircraft operating envelopes for Navy ships established by First-of-Class Trials in 2015. The key benefits from the April trial are an improved ability to operate in hot conditions and at heavy weights.

When APDR asked the Commander Fleet Air Arm, Commodore Don Dezentje, about these LHD trials he told us:

“The ability of a helicopter to launch and recover safely is dependent on environmental conditions and their impact on performance. Limits are established by highly qualified test crews using instrumented aircraft. Trials establish the safe limits in a variety of sea conditions and allow the maximum payload (fuel, weapons or cargo) to be carried. This enables the helicopter to carry bigger payloads over the maximum distance in the hottest weather.

“The benefit is manifested in improved capability for operational missions, which range from combat operations to humanitarian assistance and search and rescue. Flight Trials in April 2020 highlighted the expansion in capability that can occur from dedicated and targeted trials.”

The MH60R ‘Romeo’ is Navy’s Maritime Combat helicopter and is embarked in the Anzac Class Frigates, Hobart Class Destroyers and LHDs. This aircraft has provided a step change to the fleet’s Anti-Submarine and Anti-Surface Warfare capability through the combination of fitted surveillance systems (including an electro-optical system, radar and dipping sonar) and weapons, like AGM-114 Hellfire air-to-surface missiles and Mark 54 anti-submarine torpedoes. Secondary aircraft roles include vertical replenishment, passenger transport, humanitarian assistance and disaster relief, search and rescue, boarding operations and training.

These Maritime Combat helicopters are also able to share data with a maritime Task Group and joint force over tactical data links and voice communications.

Maintenance support for the complete MH-60R ‘Romeo’ fleet is provided by very capable technical specialists from defence industry using dedicated facilities at HMAS Albatross, Nowra.

The MH60R ‘Romeo’ is Navy’s Maritime Combat helicopter and is embarked in the Anzac Class Frigates, Hobart Class Destroyers and LHDs.

“Sikorsky Australia, a Lockheed Martin company is proud of our support to the Royal Australian Navy (RAN) through the MH-60R program and we look forward to a long and continued relationship with the RAN to deliver future manned and unmanned capabilities in the maritime domain,” said Lockheed Martin Australia and New Zealand Chief Executive, Joe North.

It doesn’t seem long since the author was photographed in September 2013 standing beside Australia’s first MH-60R at Sikorsky’s Owego, New York State, factory. That first mission-ready aircraft was delivered to the ADF in December 2013 and deployed to Jacksonville Naval Air Station, Florida where 725 Squadron was based for twelve months of crew flight training alongside US MH-60R squadrons.

Early in 2015, 725 Squadron was back and flying from HMAS Albatross, Nowra, NSW. During that first year at home, the squadron completed First-of-Class flight trials aboard one of the Navy’s Anzac class frigates and early in the year the first embarked flight was at sea. Initial Operating Capability was declared in September 2015 after a four-month HMAS Perth deployment to South-East Asia with their on board ‘Romeo’ helicopter available for missions every day.

The last of Navy’s 24 MH-60R maritime combat helicopters was accepted by then Chief of Navy, Vice Admiral Tim Barrett, in a ceremony at Nowra’s Aviation Technology Park on Monday 12 September 2016.

Navy now has the capacity to provide at least eight warships with a maritime combat helicopter at the same time, embarked on those Fleet ships equipped with suitable landing pads. The remainder are based at HMAS Albatross and are undergoing maintenance or being used for training.

SUSTAINMENT CONTRACT EXTENSION

Recently the Defence Ministers announced that Sikorsky Australia has been selected by the US Navy for continuing delivery of sustainment support for the
Navy’s fleet of MH-60R ‘Romeo’ helicopters at their state-of-the-art maintenance, logistics and repair organisation in Nowra, NSW.

Minister for Defence, Senator the Hon Linda Reynolds CSC said the agreement with the US Navy is a testament to the close ties between the two Navies.

“The US Navy play a pivotal and trusted role in the ongoing provision of support to this capability,” Minister Reynolds said.

The Royal Australian Navy has established a Foreign Military Sales sustainment agreement with the United States Navy and this contract is an extension of the current contract arrangements.

“Based at the Albatross Aviation Technology Park in Nowra, this contract will sustain the existing workforce of 140 employees and create an additional 39 new positions, including several apprenticeships in the Shoalhaven Region of NSW,” Minister for Defence Industry Melissa Price said.

APDR recently had the opportunity to conduct a phone interview with Cliff Kyle, Lockheed Martin’s MH-60R Program Lead at Nowra. The obvious first question was “Is the new sustainment contract broadly on the same terms and conditions as the existing one?”

CLIFF KYLE RESPONDED:

“The new sustainment contract is largely the same as the existing one, with some added scope. An example of one of the changes was the inclusion of some additional component deeper maintenance to be conducted at Sikorsky Australia’s facility at Nowra.”

That led into the question of whether the Australian MH-60R ‘Romeo’ helicopter configurations and capabilities are maintained in step with those of the US Navy. Cliff Kyle said “It has been the deliberate decision of the Royal Australian Navy to keep full configuration compatibility and capabilities to the baseline of MH-60R helicopters in the US Navy.”

He went on to state that there is a continuous Capability Assurance Program running to ensure that evolutions of hardware and software implemented at Nowra are in step with those of the US Navy.

APDR’s next question concerned the regularity of MH-60R maintenance. Is it triggered by elapsed time or by operational airframe hours?

Cliff Kyle told us that:

“Every three years there is a deeper level servicing where the aircraft are stripped down and all systems and components are thoroughly tested. This is the major servicing for these aircraft. In addition, as you suggested, there is operational level servicing based on airframe hours which occurs at obviously shorter time intervals for busy aircraft. There are rigorous maintenance hours of service checks which can include replacing some fatigue-based elements.”

Minister for Defence Industry Melissa Price made a comment about increased staff levels at Nowra as a result of the new US Navy sustainment contract. This led APDR to have a phone interview with Blair Drinkwater, Lockheed Martin’s Maritime Helicopter Business Development Lead, about the background to the Minister’s remark.

Blair Drinkwater gave a very clear explanation of what was behind this increase in numbers at Nowra. He said “Currently there are 140 Sikorsky Australia personnel working at Nowra, but we plan to organically grow the workforce there to around the 180 mark. We will be bringing people to the Shoalhaven area from around Australia as well as investing in young people to gain apprenticeships and undertake studies to launch them on their technology career.

“Lockheed Martin Australia, as the parent company for Sikorsky Australia, intends to grow its workforce through its regional Australia program. Of note is that throughout the COVID-19 Pandemic there has been no slowdown. The Company has been able to support Navy and continue workforce growth.

“Although the main sustainment facility is at Nowra, we are able to respond rapidly to Navy’s operational, technical and logistical requirements wherever the location.”

With all these support capabilities available from Sikorsky Australia, the natural question from APDR was “Do you see export opportunities for your MH-60R skills?” Blair Drinkwater’s response was that:

“Not only are there export opportunities for Sikorsky Australia but additional Australian industry suppliers in support of regional fleets operating the MH-60R helicopter.”

IN CONCLUSION

Asked by APDR to sum up how the MH-60R ‘Romeo’ helicopter has supported the RAN’s Fleet at Sea, Commander Fleet Air Arm, Commodore Don Dezentje said “The MH-60R has proven to be a highly capable, network enabled maritime combat helicopter with its own weapon suite. It is an adaptable and flexible platform operated and maintained by outstanding people. It is optimised for operations in the afloat environment, and remains a primary integrated component in Australia’s ability to project naval power.”
The RAN MRH fleet use basically the same helicopters as the 40 being operated by the Army. The total size of the fleet is 47, with one extra helicopter acquired as a potential source of spares. As Andrew Mathewson, Managing Director, Airbus Australia Pacific explained:

“The MRH90 fleet is maintained in a common configuration and support system across Army and Navy. This ensures the fleet is able to be supported by a common training system and the same parts pool, which allows for efficiencies in fleet planning.

“The Taipan is multirole in the truest sense – and supports amphibious, embarked, air mobile and special operations roles. These roles have differing requirements and the MRH90 has evolved role equipment in response to new and emerging requirements from both Navy and Army.”

Defence says that the Taipans in 808 Squadron provided significant aviation support to Operation Bushfire Assist as well as Direct Support to state authorities prior to the formal establishment of the ADF operation. This support spanned from November 2019 to March 2020. The MRH-90 from 808 Squadron flew 310 hours as part of the ADF response, flying throughout New South Wales, Victoria and Queensland. The MRH-90 was tasked with search and rescue, welfare checks and fire mapping tasks. A specialist Rural Fire Service member was also incorporated into the crew for this operation.

In addition to the support provided to the Australian community during Operation Bushfire Assist, 808 Squadron has embarked in the two Landing Helicopter Docks (HMA Ships Canberra and Adelaide) and HMAS Choules for deployments throughout the Pacific region.

Defence says that when operated at sea (or the vicinity of the coast), the MRH-90 has an additional servicing regime to combat the effects of a corrosive saline environment, as well as an emergency flotation system.

Navy’s amphibious and maritime support ships have increased in number and capability, and this increase requires a commensurate growth in the number of aircraft used by Navy in the Maritime Support Helicopter role. As outlined in the Force Structure Plan 2020, Defence will expand and rationalise the Maritime support helicopter fleet to provide opportunities for increased organisational efficiencies and improved logistics support.

Defence says that no decision on disposal or transfer has been made on the aircraft type. A decision will inform future plans for operation of MRH-90 in Navy.

Andrew Mathewson detailed the deployed use of the Taipans on board ships – particularly the LHDs in more detail:

“The MRH90 have been intimately involved in many of the Canberra Class voyages, including freedom of navigation activities throughout South China Sea https://www.sbs.com.au/news/australian-helicopters-targeted-by-lasers-in-south-china-sea. Airbus is proud to support both Army and Navy Operations from a range of sites in Australia -- from Darwin, through Townsville, Brisbane, Oakey, Sydney and Nowra – with more than 500 personnel involved in the support of this program. Airbus provides a full systems support – from training military aircrew, design and support engineering, material support, through to providing both deeper level maintenance and ensuring aircraft are ready on the operating unit flight line.

“Beyond Australia, the NH90, both the tactical troop transport (TTH) and the NATO frigate helicopter (NFH) are deployed in many operational theatres and Airbus is supporting our customers in these challenging environments.”

The company says that the MRH90 offers an extended range, a fly-by-wire control system providing superior handling capabilities and safety. It’s equipped with a weather radar, a large cabin, as well as integrated flotation devices, making it a highly suitable maritime support helicopter.

MRH

RAN MULTI ROLE HELICOPTERS TO THE RESCUE DURING NATURAL DISASTERS

When discussing RAN helicopters, many people reflexively think of the MH-60R fleet (see previous article). But Navy has more than that, including six MRH Taipans that were acquired to take over from venerable Sea Kings that had lost their ASW functionality but continued to be used in a utility role. They were gradually replaced by the Airbus Helicopters MRHs between 2007 and 2011.

HMAS Choules embarked MRH-90 Taipan helicopter, call sign “Hat Trick”; conducts flying serials during the ship’s transit to Vanuatu. Credit: CoA / McDougall

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Kym: Let’s start with ‘Loyal Wingman’, noting that you have just tested the jet engine on the first one.

Scott Carpendale: Yes, we are starting to go through the test program for that project. This is a very exciting activity – and I’m sure many people are aware of its huge potential for the Australian Defence Force and the country more generally. We are continuing tests for the platform as part of proving its capability and the engine test represents another key milestone.

Also we are at a relatively early stage in the activity that is short of being at production rate.

Q: Why all the secrecy, even down to the physical location of the program, the brand of engine and all that sort of stuff?
A: There are a number of stakeholders in the program – ourselves, our customer, our suppliers and so on. Over time we will be able to share more information about progress, but for the moment we need to be respectful of our stakeholders’ sensitivities. A program like this has a lot of moving parts and, with numerous entities involved, we are somewhat circumspect about what we can release in the public domain.

Q: When do you anticipate commencing flight trials?
A: Under our current project schedule we are hoping to start those before the end of this year – and they will be undertaken in Australia. This is a development program – and just like all such activities we always put safety first – but we remain on track.

Q: The question that transcends everything at the moment is the impact of COVID-19. Has that slowed you down to any extent?
A: Yes. Every day we are feeling the impact of COVID across all of our programs. The attitude of our workforce and our suppliers has been outstanding and resilient. Being able to get the right engineers alongside the appropriate aircraft and move them around the country to wherever they need to be – and also to ensure that we have the right level of support when we are conducting these various activities – is important, so the restrictions on travel have had an impact.

Our suppliers have been great. One of the benefits of Loyal Wingman being a home grown Australian development is that it has de-risked the program from the supply chain perspective because we aren’t as reliant on imports from overseas producers. We have been able to heavily leverage Australian suppliers on the platform and that means we haven’t seen the sort of disruption on the Airpower Teaming System as has been the case in some other areas. But having said that, yes COVID has definitely had an impact.

Q: I see that Boeing is one of four companies involved in a similar USAF program called Skyborg Vanguard, which also seems to be about developing an autonomous, attritable air vehicle able to perform manned-unmanned teaming. Is there a connection with the Australian program?
A: The solution we are putting forward for the Skyborg program draws heavily on our experience in Australia. Each customer will have their own unique requirements and we have to ensure that we satisfy those – and the US Skyborg activity is no different. The fact that we have such a head start in establishing a program of record and maturing the design in Australia has given us a positive leaning for the Skyborg program. We are certainly seeing a large degree of commonality.

Q: From your perspective do you see any merit in trying to merge the two programs, or is it more likely that Australia will remain a separate activity?
A: That’s a question for Defence. The Australian government has been very supportive of our program – and we greatly appreciate that. How the RAAF requirements evolve over time and how they align with those of other customers is something that we will have to wait and see what emerges. At the moment we are being responsive to the individual needs of each customer.

Q: The last time I looked at the ATS you had around 30 Australian subcontractors. Is that still the case?
A: We still have the same team – though exact numbers can fluctuate slightly. We have a substantial reliance on local companies and that hasn’t changed in a meaningful way. As we evolve through the program we are looking for even more Australian
companies to become engaged.

Q: Let’s move on to AIR 6500. After having been paused for a couple of years it seems to be moving again – how do you view it?
A: We are working with Defence to understand their renewed and accelerated views on the program as they move into a multistage approach. We believe we have substantial credibility in this space through the Wakulda program – which is the new name for the Vigilare system. The name, Wakulda, comes from the language of the Worimi people in the Williamstown area and means together. We are very supportive of Defence renaming this system as it aligns with our commitment to reconciliation with Aboriginal and Torres Strait Islander peoples.

In addition, as the prime systems integrator for both the E-7A Wedgetail and P8-A Poseidon aircraft, we have expansive capability for integrated air battle management assets – and a system-of-systems approach. All combined, we have a lot of maturity in the domain and an ability to collaborate with other members of industry and to deliver best of breed solutions.

We think that gives us the pedigree to be able to develop the architecture for the solution that best meets the customer’s requirements.

Q: I’ve felt that Defence have been a bit Utopian hoping that the four chosen US primes will spontaneously cooperate. How do you see that?
A: What we are seeing from Defence is a very clear intent that they want industry to collaborate. They have the view that the highest level of capability can be achieved by leveraging elements from a number of the large companies. We absolutely support that intent – which will need to be constructed in such a way as to take into account each entity’s commercial sensitivities.

This approach also encourages the individual companies to lean into a collaboration that gets the best outcome for Defence. We believe that they are on the right path. Rather than just expecting industry to self-organise there’s now a structure that gives us a line-of-sight to what needs to be achieved.

Q: Do you think a single prime contractor makes sense for this or is a collaborative approach the best way to go?
A: Having an architectural solution that is led by a prime systems integrator makes sense – supported by a collaboration framework that allows the work share and elements of that architecture to be fulfilled by different companies. To me that is the value of a really good collaboration framework. The model of a prime systems integrator is really important – and we believe we have the pedigree for that role.

We also have a good track record of working with many other companies to provide an integrated solution. We are certainly not shy of partnering and working cooperatively with other defence industry primes. There are a lot of examples where that approach gives Defence the best outcomes. This is particularly the case when you have a PSI with in depth knowledge of Australian industry capabilities that allows a level of flexibility and autonomy for the customer.

I believe that with the right PSI you can have a model involving a large degree of collaboration between multiple companies.

Q: Is there scope to bring in other international partners? I’m thinking specifically of Israel, which has a multi-level air and missile defence system.
A: As we go through the requirements phase – and obviously we will be responsive to whatever is involved – we will look at the need to cooperate with other governments as necessary. However, at the moment we are focussed on getting the best possible level of sovereign capability for the Australian customer.

Q: Next on the list are two of your platforms: Super Hornets and Growlers. What is happening with them regarding support and potential upgrades? One chart in the 2020 Force Structure Plan seems to show the Growlers retiring in the latter part of this decade, which seems strange.
A: My understanding is that the Growlers will be retired sometime in the 2030s – and the same is the case for the Super Hornets. The customer is continually reassessing those dates – and the plan is to remain in concert with the US Navy for the Growler in particular, but also for the Super Hornets. We will support the Australian customer in any way they wish, be it block upgrades, fatigue life management or anything else.

Q: The USN has started work on their next Super Hornet upgrade. Will that automatically flow through to Australia?
A: That’s a customer decision. We are in close contact informing the RAAF about what is happening, but I will have to refer you to them for questions regarding timing.

Q: Will you be able to do all of the upgrade work in Australia?
A: There is a large degree of that work that could be done locally. From a capability perspective we
are also working with US export controls regarding technology release. This also is a question for Defence.

Our support contract was renewed in March this year taking us through to 2025, which is evidence of the really deep partnership that exists between Boeing and the operators as well as the CASG team. The level of trust and mutual respect between the three stakeholders is absolutely outstanding.

From the Boeing perspective this is one of our flagship programs and an example of how a really collaborative approach and an open and trusting relationship with our Defence customer works in the best interests of everyone.

Q: The next big areas I want to explore are robotics and autonomy, especially for Navy. What's your view of opportunities there?

A: We have US systems like Echo Voyager in the maritime domain that we believe have real potential to augment the submarine fleet for Australia.

Looking at where we have gone as a corporation with programs such as the ATS and establishing a greater local advanced manufacturing capability that is focussed on driving costs down, we think there are real benefits to continuing to develop such capabilities. We are working with commercial entities and various companies across Australia, and we actively support the Government’s agenda to drive Defence capabilities through local industry.

While we explore opportunities to bring down cost and increase the scale of production, we have to be mindful of cyber protection – especially if we are introducing commercial and non-bespoke defence technologies. These solutions have to be cyber secure, permit information to be shared in a completely safe way, and be integrated with the rest of the ADF.

Q: With autonomous systems such as the ATS, how do you safeguard against the possibility of control of them being taken over by an unfriendly operator.

A: For all of our solutions this is a fundamental design requirement. The cyber threat is evolving constantly and for Defence to be able to complete its missions and leverage its assets in an integrated manner, it needs a high level of multi-domain security protections.

One of our responsibilities to Defence is to ensure that our design features have adequate protections in place. We have invested in having an Australian capability to evolve those products as the threats change because we have the ability to upgrade software and do what’s necessary to safeguard systems not only onboard aircraft but in the battle space more generally.

That's not just Boeing but also a lot of highly capable local SMEs working in the cyber security space. We are also working with State governments and universities to make sure we have enough trainees and graduates with the required cyber security skill sets.

Cyber security is not an afterthought – it is key to our planning.

Q: You mentioned earlier Boeing’s interest in Indigenous affairs and reconciliation. Please expand on that.

A: This is a topic that I care about a lot. We are extremely proud of our commitment to reconciliation with Aboriginal and Torres Strait Islander people across Australia. We launched our reconciliation action plan just under three years ago – and it’s been incredibly successful.

In September, we announced that we had spent a total of $10 million with Indigenous suppliers. Five million of that has been in the past year alone – a strong demonstration of how well our Indigenous supplier strategy is gaining momentum. We have a very strong relationship with the Indigenous Defence and Infrastructure Consortium and we work closely with Supply Nation. On the employment side we are driven in our aim to increase the diversity of our workforce and create more opportunities for Indigenous Australians.

We take 10 Indigenous interns every year into our workforce through the Career Trackers program and we have programs working with high schools in regional Australia to provide them with a pathway to defence industry. We also have programs encouraging Indigenous apprentices into our workforce. In the future Indigenous Australians will have a much greater representation in the sector.

We have been extremely successful in the last few years – and dare I say that I think Boeing is leading the way with our commitment to Indigenous Australians. It’s something I feel very passionate about. We are very proud of being an Australian company – and while we are part of a US enterprise, we have 2,500 people here who are proudly Australian.

There’s a real focus on doing the right thing by Australia. That starts with our Defence Force customer and extends into the broader community. This is core to our values – and Indigenous Australians are an integral part of our future.
Naval Pedigree

Operating worldwide in the most demanding open ocean and littoral environments, Leonardo Helicopters extend theatre horizons to provide force projection for Maritime Commanders.

Embarked multi-role platforms capable of autonomous detection, identification and engagement against surface and sub-surface targets, capable of rapid re-role to SAR and humanitarian support.

Inspired by the vision, curiosity and creativity of the great master inventor - Leonardo is designing the technology of tomorrow.
AUSTRALIA’S PORTS AND HARBOURS: CRITICAL NODES FOR THE NATION’S PROSPERITY

Australia is a maritime nation—perhaps the most maritime of nations—and few would argue that trade represents a critically important part of Australia’s economy. Both exports and imports are vital for Australians to maintain their high standard of living. Since Australia is an island nation with no other countries sharing its borders, the overwhelming majority of this trade goes via sea. Australia’s neighbors buy iron ore and concentrates, coal, petroleum, natural gas, beef and other commodities, as well as finished goods and professional services.

Australia’s ports, from Sydney, to Fremantle, to Brisbane, to Melbourne, to Darwin, to others, are the critical nodes from which these exports and imports are moved across the oceans. The ADF, RAN and the Department of Home Affairs share the responsibility to protect these ports and harbours from attacks by other nations, international or domestic terrorists, or from anyone else wishing to make a statement by conducting a spectacular attack on a harbour’s facilities or on ships berthed there.

However, with a coastline of over 59,000 kilometres, an exclusive economic zone of over eight million square kilometres, and other maritime interests to support throughout the region, the authorities have only discrete resources to ensure the safety of Australia’s ports and harbours. It may be time to leverage emerging commercial-off-the-shelf technology such as unmanned surface vehicles to take on the lion’s share of this vital security role.

PORTS AND HARBOURS ARE VULNERABLE

The deadly explosions that rocked the harbour in Beirut, Lebanon in August 2020 killed over 100 people and injured thousands, rendering that port unusable for an indeterminate period. The full impact of this event is still being assessed. However, lost among the headlines that dominated the international news for days was the importance of ports and harbours to the global commerce that is the lifeblood of the economy of virtually every nation.

While many people focus on the importance of ships in carrying seaborne trade, they often forget that the critical nodes that support this globalisation and burgeoning world trade are the world’s ports and harbours. A disaster in one of these ports similar to what happened in the harbour in Beirut—an oil tank explosion, a fire or other catastrophe on a large oil tanker, or any of a host of other events—could close one of these facilities for an indefinite time and also spill an enormous amount of pollution into the oceans.

The magnitude of providing comprehensive security for an average size ports, let alone some of the world’s mega-ports, can sometimes lure port authorities into wishing away the challenge. But in an increasingly dangerous world where not just terrorists, but others, may wish to make a statement or lash out at a particular nation, ports present an all too inviting target. The risk-reward curve where a terrorist group or other disaffected person or persons are able to attack a port using something as simple as a RHIB and a small amount of explosives to blow a hole in a ship—is just too great. Ports are an inviting target, and ones that must be protected.

THE CURRENT STATE OF THE ART FOR PORT SECURITY

Current security measures involve monitoring the video provided by cameras throughout the port, as well as patrolling the waters with a fleet of manned vessels. This methodology stresses the ability of port authorities to provide 24/7/365 security and typically leads to serious and potentially fatal gaps in coverage.

Cameras seem to offer a cheap and effective solution, but what people forget is that someone—often several people—must monitor the video for the cameras to have any purpose, let alone effectiveness. With some ports maintaining scores of cameras or more, this entails having a command center and enough watch-standers to monitor all of the cameras in real-time, 24 hours a day. Depending on how
the watch centre is staffed, this often means that multiple crews must be available and paid to provide round-the-clock monitoring. Further, if a camera malfunctions or otherwise goes out of service, this leaves a gap in coverage and a repair crew must be available to fix the device.

While many people focus on the importance of ships in carrying seaborne trade, they often forget that the critical nodes that support this globalisation and burgeoning world trade are the world’s ports and harbours.

Similar issues accompany the use of manned craft to patrol a harbour of any size—let alone mega-ports. Manned vessel operations are increasingly expensive, are often limited by weather and water conditions, and physically stress port professionals. For most ports, multiple manned vessels are needed to guarantee sufficient revisit time to ensure that a threat has not slipped through the security net.

Compounding the issue is the physical toll of riding a small vessel—either a rigid hull inflatable boat (RHIB) or other small craft. Unlike watchstanders on land who might be able to work shifts as long as eight or even twelve hours, pounding through an often choppy harbour in a RHIB or small craft means that a watch rotation of somewhere between three and four hours is about all most people can endure.

With such short watch rotations, it is easy to see how the need to provide round-the-clock security can quickly multiply costs, even in the most optimistic scenarios. Add rain, wind, waves, fog and other natural phenomena that often reduce visibility and slow patrol speeds, the need for more craft and more people can multiply significantly, often without warning, thereby further driving the need for standby crews. All-in-all this is an expensive undertaking.

Additionally, there are many shallow areas throughout ports that are beyond the reach of any manned vessels. Even limited draft craft like RHIBs draw some water when they are loaded with people, communications equipment, weapons and the like. A manned vessel pushing too close to shore also runs the risk of impaling itself against visible or invisible hazards. This risk is compounded at night and during fog and other adverse weather conditions.

Given the manifest challenges of providing adequate let alone comprehensive security for ports with current systems and capabilities, it is little wonder that port officials are searching for technology solutions that will enable them to provide better security, at lower costs, but more importantly, without putting humans at risk.

THE PORT OF LOS ANGELES: A MEGA-PORT WITH A MEGA-CHALLENGE

The Port of Los Angeles (POLA) is one of the world’s mega-ports and is the busiest port in the United States. It comprises 42 square miles of water, 43 miles of waterfront and 26 passenger and cargo terminals. POLA handled over 9.3 million twenty-foot equivalent units (TEUs) of cargo in the last year for which statistics are available.

Current capabilities to secure it involve monitoring the video provided by hundreds of cameras, as well as patrolling the port’s expanse of water with a fleet...
of manned vessels. This methodology stresses the ability of POLA authorities to provide around-the-clock security. For these reasons, Port of Los Angeles officials decided to explore the possibility of using unmanned surface vehicles to enhance the security of the port. To that end, port officials invited Maritime Tactical Systems Inc. (MARTAC) to visit and demonstrate the capabilities of their MANTAS USVs. MANTAS is a high-performance, commercial off-the-shelf USV built on a catamaran-style hull, and comes in a number of variants ranging in size from six-foot to 50-foot. A demonstration was conducted using a 12-foot MANTAS.

The 12-foot MANTAS (otherwise known as the T12) has a length of twelve feet and a width of three feet. It is fourteen inches high and draws only seven inches of water. The MANTAS can be equipped with a wide variety of above-surface sensors (EO/IR/thermal video) and below-surface sensors (sonars and echo-sounders), as well as other devices such as chem/bio/nuclear sensors, water quality monitors, and above/below surface environmental sensors.

**LEVERAGING PREVIOUS SUCCESSFUL DEMONSTRATIONS**

One of the primary reasons that POLA authorities requested the MANTAS system demonstration was the fact that it had performed well in a port security demonstration conducted by the U.S. Army. Earlier, three MANTAS T-series vessels were part of the Mobile Ocean Terminal Concept Demonstration in Concord, CA coordinated by the Army Physical Security Enterprise & Analysis Group. The primary objective of this demonstration was to assess MANTAS’ ability to patrol and protect the harbour. For these missions, three MANTAS vessels, T6, T8 and T12, were used to perform different operations. The MANTAS T6 was utilized as an intercept vessel to quickly address potential threats at high-speeds up to 55 knots. This T6 was equipped with a standard electro/optical camera focused on rapid interdiction and threat identification. The second vessel was a MANTAS T8 equipped with a FLIR M232 thermal camera. Its role was as a forward-looking harbour vessel situational awareness asset. The final vessel was a MANTAS T12 tasked with prosecuting above and below surveillance operations to detect and identify intruder vessels, or other threats to harbour assets. The sensor kit included a SeaFlir 230 for above surface ISR capabilities and a Teledyne M900 for subsurface diver/swimmer detection.

**THE PORT OF LOS ANGELES UNIQUE REQUIREMENTS**

During the visit to the Port of Los Angeles, MARTAC representatives provided a comprehensive briefing on MANTAS capabilities, took a three-hour boat tour to observe the entirety of POLA authorities’ span of operations, and then provided a remote demonstration where port officials controlled and observed a MANTAS T12 operating off the eastern coast of Florida. The demonstration validated the going-in assumption that employing a thoroughly tested and proven USV is a viable solution POLA is keen to pursue.

After observing the MANTAS remote demonstration, it was determined that the capabilities of this USV met the requirements for the wide variety of missions for the Port of Los Angeles. That said, port officials asked MARTAC to scale-up the MANTAS to a 24-foot and 38-foot version. It was felt that the 12-foot MANTAS was so stealthy that ships in transit could not see it. Additionally, the larger T24 and T38 could operate for longer periods and carry additional sensors. The T38 MANTAS has now been demonstrated in U.S. Navy exercises, and is scheduled to be demonstrated in the Port of Tampa, Florida later this year.

**DISASTER RELIEF AND MITIGATION FOR PORTS AND HARBOURS**

While this article has focused on using commercial-off-the-shelf unmanned surface vehicles for day-to-day, 24/7/365 port and harbour security, a related mission for which COTS USVs are ideally suited is their use for disaster relief and mitigation. This capability is needed following a catastrophe at one of these ports, at a power plant, after an air crash or ship disaster, following flooding of low lying areas, or any other humanitarian assistance of disaster relief incident where areas are either inaccessible to humans or too dangerous for humans to deal with.

One need only look to events such as the Fukushima Daiichi nuclear disaster in March 2011 to understand the challenges of dealing with these sorts of catastrophes. In the wake of natural disasters such as Fukushima Daiichi, rapid location of injured personnel becomes a critical and time-sensitive mission that is ideally suited to unmanned surface vehicles, especially in shoreline areas not accessible by larger harbour boats or rigid-hulled inflatable boats, or not safely accessible due to potential personnel hazards such as biological, chemical or radiological agents.

In performing these missions, unmanned surface
vehicles can be fitted with a wide array of video, audio, sonar or other sensors to locate personnel and assess damage. In some cases, larger USVs can transport relief supplies to areas not otherwise accessible. While unmanned surface vessels may not completely replace manned assets in disaster relief and mitigation nor are they intended to, they can provide an immediate response while authorities are assessing whether or not the scene of the disaster poses an unacceptable risk to human responders.

ADVANCING THE ART OF AUSTRALIAN PORT AND HARBOUR SECURITY

In a 2018 posting on their website, Australia’s Department of Home Affairs said this:

“The Australian Government is committed to uplifting the security and resilience of Australia’s critical infrastructure to protect the essential services all Australians rely on.” This relatively new agency (which was established in December 2017) has an important mandate, and from this observer’s perspective, none more important than protecting Australia’s ports and harbours.

Australia’s ports are critical to the nation’s economy. A disaster like a fire, explosion, or a major oil spill could close one of these ports for an indefinite time. As the world comes to grips with the human and economic impact of the Beirut harbour disaster, all nations would be well-served to leverage emerging technology to enhance the security of the ports and harbours that make the global economy hum. To fail to do so would be inviting a disaster that is eminently preventable.

In an article in the January 2020 issue of U.S. Naval Institute Proceedings, Commander Rob Brodie noted:

“When the Navy and Marine Corps consider innovation, they usually focus on technology they do not possess and not on how to make better use of the technology they already have.” Extrapolating his assertion to the entities responsible for port and harbour security for Australia, one must ask if we are too slow to leverage an innovative solution that can be grasped immediately.

The enhanced security taxonomy described in this article had not been evaluated prior to the demonstrations described above, and there is a reason. The technology to provide reliable, adaptable and affordable USV support to augment manned capabilities and expand the reach of port police at facilities such as Australia’s ports simply did not exist just a few years ago. But that has now changed.

This technology is available today with commercial off-the-shelf unmanned surface vessels, and these can be employed to increase the effectiveness of port protection if we do as Commander Brodie suggests and “make better use of the technology we already have.” Given the enormous personnel costs associated with monitoring cameras and patrolling with manned vehicles, this innovative solution designed to supplement current capabilities will drive down acquisition and life cycle costs while resulting in shorter times for a return on investment.

The way that commercial-off-the-shelf unmanned surface vehicles have performed in an increasing number of military and civilian exercises, experiments and demonstrations, shows they have the potential to be leveraged more fully and more quickly for a variety of missions. Innovating with COTS systems we have at hand would appear to provide a near-term, affordable and effective solution to the challenge of providing comprehensive port and harbour security for Australia. Like any new technology, COTS USVs take a while to gain traction. But there is danger in waiting too long to put them to use.
The Minister said that the new version of Aegis will also be the version for the future Hunter class frigates:

“The Aegis combat system is the brain of Navy’s integrated air and missile defence capability. In the face of compressed timelines and to protect Australian forces, Defence requires the agility to sense, decide and take action against contemporary and future threats.”

“Recently at RIMPAC 2020, HMAS Hobart successfully conducted coordinated surface to air missile firing demonstrations using the current version of the Aegis combat system, demonstrating interoperability with the United States and our ability to field air missile defence capabilities.”

Another important element of the upgrade will be the installation of Saab’s 9LV software to replace the current Australian Tactical Interface (ATI) at the heart of the system. The Minister added:

“By installing the latest Aegis combat system and developing the Australian Interface here in Australia, we are guaranteeing the development of a long term Australian combat management system capability.

“This is not only a strategic Defence investment that will enhance the skills and grow a sustainable Australian combat system workforce that is over 200 strong over the next decade, but guarantees...
we have sovereign control of this key technology for our Navy fleet."

The Aegis combat system upgrade will align the Hobart class Destroyers and the Hunter Class Frigates with the United States Navy Aegis Baseline 9 capability providing access to the Aegis Common Source Library. Work is scheduled to start in 2024 to coincide with a major docking of a Hobart class vessel because the changes to the combat system involve quite a bit of new hardware as well as software. Defence says the detail, including the order in which the ships will be upgraded will be "informed by other Australian shipbuilding and maintenance activities."

Defence says that the Aegis Common Source Library will enable rapid capability insertion activities to take place, through increased levels of system virtualisation and open architecture, in order to counter emerging threats. This evolution of the Aegis combat system means that adding new features to the Common Source Library will be like adding "apps" to your smartphone. Additional functionality introduced by Baseline 9 includes improved Integrated Air & Missile Defence capability.

For those interested in what a Common Source Library does, the RAND Corporation explains that it is a master library that stores the code for all the Aegis applications and allows the US Navy to develop several software components concurrently that can then be propagated to the fleet. According to Lockheed Martin, this enables customers to rapidly integrate new capabilities across the fleet in a "build once, use many times" framework.

Apparently, this enhances life cycle affordability by reducing costs for development, integration, and test through extensive commonality and reuse. The CSL is moving toward more rapid fielding of capability and enables early collection of data required for training, tactics development and certification. Lockheed Martin US says this has established the commonality essential to an integrated combat system and is facilitating greater interoperability across the fleet, reduced training costs and improved flexibility in crew assignments.

However, while Aegis will be upgraded so that both the Hobart and Hunter class ships have an anti-ballistic missile capability, to transform this into reality will require the RAN to move to longer range missiles, particularly SM-3. This is because SM-3 has enormous range due to a large booster rocket and can intercept incoming ballistic missiles while they are still well outside the atmosphere and travelling on a predictable trajectory.

Destroying an incoming threat at such a distance has the advantage that the debris will be burnt up on re-entry rather than showering the targeted ship with bits and pieces of metal – or even worse things if the warhead is made of nuclear, chemical or biological material. The task of destruction by the direct impact of the SM-3 interceptor on a hostile missile warhead is far from trivial given that a typical speed for such an object is 10km per second in the vacuum of space.

Asked about the missiles that might arm the Hobart class, Defence said:

"The Hobart Class will continue to use the SM2 missile. As forecast in the Government's Force Structure Plan 2020, the Aegis combat system upgrade will enable the Hobart class to employ current and future advanced maritime guided weapons, including extended range surface-to-air missiles subject to Government consideration."

Speaking with Rob Milligan, Lockheed Martin Australia, Integrated Warfare Systems & Sensors Lead it looks like it will be possible to undertake all of the Aegis upgrade work locally. The company has a combined team for both the Hobart and Hunter class programs that is 100% LMA personnel. The Aegis systems for both ships will be the same, apart from allowing for the different sensors and weapons mix of each. It is likely that they will have very similar combat information centres, which will simplify training and allow personnel to switch between the two classes with ease.

The process of knowledge transfer to develop sovereign capability has involved people working in the US for several years familiarising themselves with the technology – and a benefit of that has been that the activity has not stopped because of COVID-19 since everyone is in the same country and the same time zone. Another positive has been that the Hobart class team at Garden Island has become self-reliant faster than expected and is now able to conduct the full range of Aegis & SPY radar related tasks, including deep level maintenance and upgrade activities.

LMA's maritime team numbers about 350 people, which includes the two surface combatant classes, the Attack class future submarine project and support of the Nowra-based MH-60R helicopter fleet. LMA is an integrated and functionally matrixed organisation, enabling people to work across a broad range of projects as required and this approach avoids people being constrained to a single platform or project, thus widening their individual experience base.
SUPPORT FOR THE RAN FLEET AT SEA

The key to the combat power that maritime task groups generate and sustain is the ability to perform multiple tasks simultaneously and for extended periods. This operational flexibility and force resilience is delivered through a combination of Navy’s combat support capabilities, including ships and aircraft at sea, for example supply ships and Navy helicopters; Defence’s key sustainment organisations ashore; and Navy’s enduring partnerships with Australian Defence Industry.

When asked about the two new Supply Class Auxiliary Oiler Replenishment (AOR) ships soon joining Navy’s Fleet, Rear-Admiral Pete Quinn, Head Navy Capability, told APDR:

“Combat support vessels such as the AORs are an essential element of the Maritime Joint Force. Adding to this capability, the 2020 Force Structure Plan provides a commitment to acquire two Joint Support Ships which will provide further depth to the Maritime Joint Force’s Combat Support and Amphibious Capabilities.”

Australia’s current supply ships HMA Ships Success and Sirius are being replaced with a single class of two double-hulled AORs built by Spanish shipbuilder, Navantia. The two Australian ships, named Supply (II) and Stalwart (III), are based on the Spanish Navy’s Cantabria Class AORs.

These ships are intended to carry fuel, dry cargo, water, food, ammunition, equipment and spare parts to provide operational support for the deployed naval or combat forces operating far from the port on the high seas for long periods.

In addition to replenishment, the vessels can be used to combat against environmental pollution at sea, provide logistics support for the armed forces, and to support humanitarian assistance and disaster relief (HADR) operations following a natural disaster.

NUSHIP Supply successfully completed sea acceptance trials in mid-August 2020 and sailed for Australia from Ferrol, Spain on Wednesday 2 September. She will arrive in Western Australia in early October for further fitting-out. This includes installing the Phalanx Close-In Weapon System, Communications Suite, Typhoon and Combat System followed which further trials will be conducted.

NUSHIP Supply is scheduled to be commissioned into Royal Australian Navy service in April 2021 and Initial Operating Capability (IOC) is due by the end of September 2021. Supply will have achieved IOC when she has successfully demonstrated the ability to conduct replenishment at sea within a maritime Task Group scenario.

The arrival of the AOR NUSHIP Supply also brings the commencement of a five-year sustainment contract, primed by Navantia Australia, which will generate more opportunities for Australian companies to join Navantia’s global supply chain and create jobs for Australian workers.

The AORSPO Enterprise, which Navantia Australia has formed with the Australian Department of Defence’s Capability Acquisition and Sustainment Group, is already providing 40 new jobs for Australians.

NUSHIP Stalwart is due to join Navy’s Fleet in 2022.

SUPPLY CLASS AORS

The two Supply Class AORs are huge vessels which, even empty, displace 19,500 tonnes of sea water. To this can then be added 9,800 tonnes full load deadweight of various fuels and lubricants, ammunitions, fresh water and provisions, which they can simultaneously supply to three ships.

A typical full load comprises 1,450 cubic metres of JP5 jet fuel, 8,200 cubic metres of marine diesel fuel, 1,400 cubic metres of fresh water, 270 tonnes of ammunition and 470 tonnes of provisions.

These vessels are 173.9 metres in length overall, with a beam of 23 metres and a draft of 8 metres. They are propelled by two huge MAN 18V 32/40 main engines to a maximum of 20 knots, and possess a range of 6,000 nautical miles at 13 knots. Four MAN generator sets provide 1,500 kW of electric power with some redundancy.

Fitted with a hangar and rear flight deck they can carry one helicopter, either an MRH-90 Taipan transport aircraft or an MRH-60R ‘Romeo’ maritime combat helicopter.

There is accommodation for 122 personnel including crew. These ships also carry a crew medical centre with 10 beds, including operating facilities equipped for telemedicine by videoconference, an X-ray room, dental surgery, sterilisation laboratory, and gas containment.

REPLENISHMENT AT SEA

Some Fleet missions may involve warships running low on consumables without an Australian replenishment vessel within range and with a port visit being undesirable in foreign waters.

APDR asked Defence about when Fleet units are at sea for longer than normal endurance provisioning, is there sometimes transfer of supplies, munitions or fuel, between two or more warships sailing in a task group?

A DEFENCE SPOKESPERSON EXPLAINED THAT:

*The replenishment of provisions at sea, known as Replenishment at Sea or RAS, is standard operating procedure for deployed warships sailing as part of a
HELICOPTER OPERATIONS

All major warships in the RAN can carry at least one helicopter which can be used for observation of the ship’s surrounding waters out to a large number of nautical miles, also ship-to-ship transfers of personnel, medical help or transfer of injured personnel ashore, etc.

The roles for Navy MH-60R ‘Romeo’ helicopters are primarily for Anti-Submarine Warfare, Anti-Surface Warfare, and Amphibious Operation Support. These Maritime Combat helicopters are also able to share data with a maritime Task Group and joint force over tactical data links and voice communications.

The MRH-90 Taipan operates from the Navy’s Amphibious and Combat Support ships and provides vertical replenishment, personnel transfers and amphibious operation support.

Secondary aircraft roles for both types of helicopter include humanitarian assistance and disaster relief, search and rescue, boarding operations and training.

USING UNMANNED AERIAL, SURFACE AND UNDERWATER VEHICLES

The use of unmanned vehicles offers a range of benefits to a warship for continuous situational awareness, use of lightweight specialist sensors, easy launch and landing when compared with a manned helicopter, multiple unmanned aerial vehicles aloft at once - the list goes on.

Similarly, unmanned vehicles are very useful for the ‘dull, dirty and dangerous’ tasks which they can carry out. They also drive greater efficiencies in personnel numbers. Either requiring fewer crew members absolutely, or deploying some multi-skilled personnel in other roles for a lot of the time.

Through SEA 1905, the acquisition of a further 2 Arafura-class offshore patrol vessels in a mine counter-measure configuration, a new capability will exploit emerging robotic and autonomous systems to conduct mine countermeasures and military survey effects in a ‘stand-off’ mode, rather than within the minefield, as is the practice of traditional mine countermeasure vessels. This concept of robotic and autonomous mission packages, with a mothership standing off at a safe distance, constitutes a significant paradigm shift in delivering the capability effect.

The key concept of SEA1905 is the delivery of mission packages that are scalable and versatile. The mission packages will be able to be transported by land, sea and air and be deployed from land or sea, such as from a Hunter Class Frigate or Canberra Class LHD.

Complementing Project SEA 1905 are Projects SEA 1770 and 1778. These projects will introduce unmanned underwater systems for mine warfare and military surveys. SEA 129 Phase 5 Maritime Unmanned Aircraft Systems will provide a persistent and enduring Intelligence, Surveillance, Reconnaissance and Targeting, communications relay and geospatial data collection capability to the Arafura Class Offshore Patrol Vessel and Major Fleet Units.

The unmanned aircraft will support surface naval vessels in warfare roles force protection, Humanitarian Assistance and Disaster Relief (HADR), and search and rescue operations. These unmanned systems will also team with manned aircraft, such as the MH-60R ‘Romeo’ Maritime Combat Helicopter, to extend the maritime forces surveillance capability and endurance.

SUPPORT FROM THE AIR AND SPACE DOMAINS

Maritime patrol aircraft and satellite surveillance obviously help the warship(s) and/or task group travel at an economical speed, without having to divert and check potential hazards to their passage or mission.

When APDR discussed this, a Defence spokesperson said:

“Tactical data exchange between Maritime Patrol Aircraft and the fleet is achieved through tactical data links including Link 16, as well as voice communications via UHF, VHF, HF and SATCOM.

“Other near real-time, less time sensitive tactical and administrative communications are also available via Defence IT systems and message traffic.”

Questioned on whether RAN warships are supported by a capability to call up satellite imagery of areas of particular interest e.g. other warships in their area of operations, the spokesperson cautiously replied:

“Navy warships can access satellite imagery to support a Commanders’ situational awareness.”

IN CONCLUSION

The two new Supply Class ships will carry fuel, dry cargo, water, food, ammunition, equipment and spare parts to provide operational support for the deployed forces operating away from their home ports for long periods.

Not only that, but they will be valuable assets supporting humanitarian assistance and disaster relief missions after natural disasters which happen all too often in the South Pacific region. By having three such capable vessels home ported in Perth, Sydney and Auckland (RNZN) this will ensure a prompt response to a call for help.
HMNZS Aotearoa is the RNZN's new Polar-class sustainment vessel built by Hyundai Heavy Industries at Ulsan, South Korea. Aotearoa is a purpose-built, technologically enhanced asset that adds real value to New Zealand's combat operations, humanitarian relief functions and operational and training support. Her primary mission is to provide global sustainment to New Zealand and coalition maritime, land and air units, and United Nations security operations through summer resupply of ship and aviation fuel, dry goods, water, spare parts and ammunition.

She has been built to adhere to Polar Code safety regulations and is ice strengthened to Polar Class level 6 for Southern Ocean monitoring and Antarctic operations including the resupply of McMurdo Station and Scott Base.

It has taken just four years from July 2016, when Government announced their intention to acquire a Maritime Support Capability vessel until 29 July 2020, when Aotearoa was commissioned at RNZN's Devonport Naval Base.

Now follows a period of crew training, fitting of government furnished equipment, plus wharf-side, harbour and coastal sea trials before Aotearoa pays her first visit to her home port of New Plymouth, probably in November 2020.

After further working up, Aotearoa will be able to undertake limited operational missions. For example, she could be able to perform humanitarian aid, disaster recovery and search and rescue tasks by early 2021. The ship and her crew will be deemed to be fully capable once her first deployment to Antarctica is completed in the summer of 2021/22.

Aotearoa utilises a world-first naval 'Environship' leading edge bow design. This incorporates a new wave-piercing bow which reduces resistance and lowers fuel burn, while its Combined Diesel Electric and Diesel propulsion plant has lower fuel emissions than older vessels. Her Selective Catalytic Reducers reduce harmful nitrogen oxide exhaust emissions.

**ROLE OF HMNZS AOTEAROA**

Aotearoa replaces the Navy’s supply ship HMNZS Endeavour which was decommissioned in 2018. Able to carry and generate fresh water, her cargo can include amongst other things fresh and frozen foodstuffs, ammunition, and a range of fuels in large quantities. Her Role 1 hospital has a 2-berth ward and a treatment room. Aotearoa has a core crew of 65 plus 11 flight crew, with total bunks for 100 personnel.
Her many capabilities include the ability to carry up to 22 x twenty foot shipping containers, including 12 TEU containers of supplies, four of which can carry ammunition, high capacity fresh water generation plants (enough to produce 100,000 litres per day for humanitarian aid and disaster relief), self-defence systems, aviation and marine fuel cargo tanks, dual all-electric replenishment at sea rigs, a SH-2G(NZ) Seasprite or NH90 medium utility helicopter, integrated communications and bridge systems, an integrated platform management system and winterisation features such as some upper deck trace heating and an ice-strengthened hull and underwater fittings.

For its self-protection the vessel is armed with a Phalanx close-in weapon system (CIWS) located at the forward bow deck, which will provide close-point defence against anti-ship missiles and aerial targets such as low-flying aircraft and helicopters. She can also be mounted with two mini-Typhoon light weapon stations on both sides.

BRIEF HISTORY FROM CONCEPT TO COMMISSIONING

On 18 July 2016 the New Zealand Government announced their intention to have a Maritime Support Capability vessel built. In April 2017, after a national competition, the new ship was given the name Aotearoa. By the end of January 2018, the first steel had been cut, with the keel laying ceremony held in August of that year.

On 24 April 2019 Aotearoa was launched by flooding the shipyard in which she was being built. Then on 25 October 2019 there was the formal naming ceremony at HHI's shipyard. Dame Patsy Reddy, Governor-General of New Zealand and the ship’s sponsor, did the honours.

Fast forward to June 2020 when NUSHIP Aotearoa arrived at Devonport Naval Base, after being accompanied by a fleet of well-wisher yachts and motor boats into Waitemata Harbour. At the Commissioning ceremony on 29 July 2020 Dame Patsy Reddy, as ship sponsor, said “Aotearoa – a grand name for a grand ship. It’s symbolic of how this ship will represent us on the international stage. It’s immediately recognisable in the Pacific region and beyond, as well as here in our home waters.”

CAPTAIN Simon Rooke, Commanding Officer of Aotearoa, said to VIPs and his officers and sailors “You’re witnessing a ship becoming a commissioned warship of the Royal New Zealand Navy. We have a huge responsibility, to be courageous. I have every confidence that you will achieve all we are tasked to do. I promise to all of you, with the support of the very best sailors on board, that Aotearoa will live up to her motto – Kokiritia (Onward).”

CREW COMMENTS ON JOINING AOTEAROA

For CAPT Simon Rooke it’s now all hands on deck. “I’m delighted with the calibre of officers and sailors we have and I know how proud they all are to be posted to Aotearoa,” he said. “There’s something very special about being a crew member of not only a brand-new Navy ship but the biggest one we’ve ever had in our fleet.”

Leading Marine Technician Oliver Redshaw is part of the inaugural crew of Aotearoa. “It has been a goal since before I joined the Navy to travel as far south as possible and hopefully at some stage on Aotearoa I can get to Antarctica,” he said. “It will be so special to sail to a place not many people have been to.”

He trained as an electrical engineer, where a typical day involves working on the electrical systems on ships, conducting servicing or maintenance on anything from electric motors and lighting circuits, and working on ships’ generators and main engines.
AOTEAROA

GEORGE INTERVIEWS SIMON ROEKE MNZM RNZN, COMMANDING OFFICER HMNZS AOTEAROA

Geoff: We have known one another for a long time, Simon. We first met when you were Commissioning Captain of HMNZS Otago, RNZN’s first Offshore Patrol Vessel which had been launched at Williamstown Dockyard Melbourne with my family winery’s sparkling wine. A few months later you were Delivery Captain for Navy’s second OPV, HMNZS Wellington. You have now held six ship commands. How does it feel to be Commissioning Captain of the RNZN’s largest ever vessel?

Simon: Command is a privilege and an honour. I have been fortunate in being able to gain Command experience on a range of ships, but I can tell you Geoff, this Command is very special. To be the first CO of a ship bearing our country’s name is an incredible privilege.

Geoff: Before we discuss the current workup and likely future deployments for HMNZS Aotearoa, can we look back to your time as Commander of the Navy’s large multi-role vessel HMNZS Canterbury? While captaining her, among other events your ship deployed to Vanuatu to provide relief after Cyclone Pam hit there in 2015 and again after Cyclone Winston, Fiji in 2016, then in the Kaikoura earthquake response in 2016. What experiences then will help prepare you now for HMNZS Aotearoa’s operational deployments?

Simon: My experiences on Canterbury confirmed for me just how exceptional our people are. It also proved how effective we can be when we combine our sailors’ mariner skills with the specialist skills of the soldiers and airmen of the NZDF, as well as partner agencies/nations when we work in regional or national partnerships. I envisage Aotearoa operating in a collaborative manner utilising NZDF and regional partnerships to deliver support to operations, from the sea.

Geoff: In summer last year you went down to McMurdo Sound, Antarctica on a huge cargo ship following a path being cleared by a US icebreaker. What was that experience like?

Simon: Sailing into McMurdo on the MV Ocean Giant was incredible and opened my eyes to operating in the Antarctic region - it is unique! The main lesson for me was to respect the operating environment by having the right equipment and support. I’m confident Aotearoa will be up to the task. Aotearoa has specific design aspects to enable operating in Antarctica, and we will have Ice Breaker support as part of our joint logistics partnership with the US.

Geoff: Do you now have all ship’s personnel aboard for HMNZS Aotearoa’s work up of initial capabilities?

Simon: Yes, we do, we have a full complement and we are all learning our new ship together.

Geoff: What are the main things you will be concentrating on during your ship’s first passage from Devonport Naval Base to her home port of New Plymouth?

Simon: We won’t be sailing directly to New Plymouth. Initially we will be undertaking a Sea Trails period to build our proficiency and prove our systems and procedures, then we will be taking Aotearoa to New Plymouth for our first home port visit, to uplift our Charter and introduce our ship to New Plymouth and the people of the Taranaki region.

Geoff: Looking further ahead, when do you expect to make first operational replenishment deployments?

Simon: We will be developing our underway replenishment capability during the first half of 2021. We envisage working with HMNZS Te Kaha when the ship returns from FSU (Frigate Systems Upgrade) in Canada, and of course RAN ships during exercises early next year.

Geoff: Thank you Simon. Best wishes to you and your crew for the coming workup and deployments of HMNZS Aotearoa.

Simon: Thank you. I am excited about all the upcoming opportunities to learn new skills, travel the world and serve my country on this beautiful new ship.”

Geoff’s role on Aotearoa will be to provide secure and reliable means of communication using flag signalling and hoisting, Morse code, tactical voice operation, radio, and sending and receiving signals between ships and to shore stations.

COMPARISON WITH THE TWO NEW RAN SUPPLY CLASS AORS

At 173.2 metres length overall, a similar size to the two new Australian Supply Class Auxiliary Oiler Replenishment (AOR) ships, Aotearoa will displace 26,000 tonnes, with a design speed of 16 knots and a range of 6,750 nautical miles. She will provide a 9,000 tonne liquid capacity, just slightly less than the new Australian AORs which can carry 9,500 tonnes of liquids. With 65 core crew, there will also be one VIP cabin plus bunks for 11 helicopter flight support personnel, an eight-person mission team, plus 14 trainees and a two-bed ward and treatment room in the Role 1 medical facility.

Australia’s current supply ships HMAS Success and Sirius are being replaced with the Supply Class of double-hulled, AORs built by Spanish shipbuilder, Navantia.

The RAN ships are intended to carry fuel, dry cargo, water, food, ammunition, equipment and spare parts to provide operational support for the deployed naval or combat forces operating far from the port on the high seas for longer periods.

In addition to replenishment, the vessels can be used to combat against environmental pollution at sea, provide logistics support for the armed forces, and to support humanitarian assistance and disaster relief operations following a natural disaster.

Their length overall is 173.9 metres, with a 23m beam and 8m draft. Their maximum sustained speed is 20 knots, with a range of 6,000 nautical miles at 13 knots. They can carry 450 cubic metres of JP5 jet fuel (around 350 tonnes), 8,200 cubic metres of marine diesel fuel (over 7,000 tonnes), 1,400 cubic metres of fresh water (1,400 tonnes), 270 tonnes of ammunition and 470 tonnes of provisions.

There is accommodation for 122 personnel including crew. These ships also carry a crew medical centre with 10 beds, including operating facilities equipped for telemedicine by videoconference, an X-ray room, dental surgery, sterilization laboratory, and gas containment.
Another way of posing the question is: the RAN looks to be gearing up for high intensity conflicts, but is it also prepared for asymmetric warfare? A lot of recent analysis has focussed on China’s increasing military muscle – and in particular its huge naval build up. Even when the PLA(N) is taken in isolation it is a formidable force, but to this needs to be added the Chinese Coast Guard and even the vast fishing fleet, which can be found all around the globe.

In a high intensity conflict, if the RAN is within 1,000km of the Chinese coastline – say, in the South China Sea – it risks aerial attack from DF-21 “carrier killer” ballistic missiles and supersonic cruise missiles of the SS-N-22 AShM / Moskit family that can be launched from land, aircraft and ships. To that can be added threats from submarines, both conventional and nuclear – armed with torpedoes and missiles.

To break all of this down in a short article is impossible, but the RAN has various ways of countering some scenarios using these weapons. Ships that are equipped with ESSM and / or Standard Missiles – Air Warfare Destroyers, future Hunter class frigates and the current fleet of ANZACs – have considerable ability to protect themselves from supersonic cruise missiles, even if they arrive in swarms.

The ability of ships to defend themselves against the DF-21 is far less certain, though upgraded AWDS later in the decade and Hunters will have some capability – but only if the RAN invests in an exo-atmospheric missile such as the SM-3.

Defence against submarines is an even higher priority and here the Hunter class will have excellent ASW capabilities centred on the mighty Thales 2087 active low frequency variable depth towed sonar. To counter increasingly quiet submarines that are impossible to detect passively, the solution is to blast the water with a high powered active sonar that can send and receive signals over very large distances. These will be complemented by MH-60R helicopters with active-passive dipping sonar. This combination should be enough to at the very least keep submarines at a safe distance, if not actually sink them.

But China is not the only threat – and even if it were, it is entirely credible that asymmetric technologies could be a major part of the equation. Malacca or Hormuz straits. Medium calibre automatic cannon and small missiles – such as of the anti-tank guided weapon variety – are often the most effective countermeasure and deterrent, especially against manned platforms. Ships should also carry specialised electronic countermeasures systems that can jam or capture hostile drones.

As it happens, Australia has some of the building blocks of an effective asymmetric threat system with several elements already in service. Three of them come, not coincidentally, from Israel’s Rafael Defence Systems, which has expertise in defeating threats ranging from high intensity state-on-state conflicts all the way through to hybrid warfare, terrorism and organised crime.

Rafael supplies the RAN with the 25mm Typhoon automatic cannon and associated Toplite electro optic system for most surface ships. The company says that upgrading to a heavier – and increasingly common - 30mm Bushmaster chain gun would be relatively straightforward. Typhoons are being supported locally in association with SERCO.

At the same time the company is supplying the Army with SPIKE fire-and-forget anti-tank guided missiles that can also be used extremely effectively against small sea surface targets. SPIKE is the western world’s most prolific ATGW, and is being produced locally by a joint venture with Varley. It will be on all LAND 400 Phase 2 and Phase 3 vehicles as well as used by infantry combat units.

But China is not the only threat – and even if it were, it is entirely credible that asymmetric technologies could be a major part of the equation.
PROTECTED MOBILITY UPGRADE PROJECT
The Protected Mobility Project will replace NZDF’s main operational land vehicle fleets, providing New Zealand troops with enhanced protection. This includes both armoured and non-armoured vehicles which will provide an adaptable capability suited to a wide range of operations.

The Project is being run in stages over ten years, ensuring that New Zealand’s land forces remain suitably resourced for operations now and in the future.

Phase 1: 2018/2024: Replace and enhance the capabilities offered by the current Pinzgauer fleet and operational Unimogs.

Phase 2: 2025/2026 onwards: Upgrade or replace the NZ Light Armoured Vehicle Capability.

A delivery of Polaris MRZR-D vehicles in May 2020 fulfilled the Project’s High Mobility (Light) vehicle category of a lightweight, compact sized off road vehicle. MRZR will be used in roles including humanitarian and disaster relief activities, movement of combat supplies, and casualty evacuation.

The replacement of the existing armoured Pinzgauers with the NZ5.5 Bushmaster was announced in July 2020. The Australian manufactured Bushmaster improves NZDF’s ability to undertake population support and peacekeeping missions. It has a proven track-record of operational service over many years. The Bushmaster is used extensively by overseas partners and will provide NZDF personnel with greater protection, flexibility and versatility.

MX-20 TURRET TO BE FITTED TO RNZAF P-8A AND C-130J-30 AIRCRAFT
The three cameras fixed to the turret on the chin of the RNZAF’s existing P-3K2 Orion maritime patrol aircraft spin 360 degrees, have wide angle and zoom lenses, show infrared imagery and can even spot whales swimming under the ocean’s surface.

It is an important instrument for the P-3K2 aircrew when they are on a search and rescue mission or on a maritime patrol operation, used to augment the other sensors on the plane including the “Mark One Eyeball” and provide a close-up view of the scene in all conditions.

Air warfare specialists operate the cameras with a joystick from the Tacrail. The equipment is so high tech, that by using the infra-red camera, the crew can identify heat sources, such as running engines on vessels, or people, in complete darkness.

There are five computers inside the equipment that are networked together. It has its own inertial navigation system and its own GPS navigation system. The whole camera platform is stabilised on electromagnets that levitate the cameras inside, so if the plane hits turbulence, the picture will still be clear.

The technology will continue to be used when the P-3K2 aircraft are replaced by the P-8A, which comes fitted with an upgraded version, the MX-20HD, as well as the new Super Hercules C-130J-30 aircraft.

(Information supplied by the RNZAF’s ‘Air Force News’ magazine)

TECHNICAL SUPPORT PARTNERS APPOINTED FOR SOUTHERN OCEAN PATROL VESSEL PROJECT
Beca Applied Technologies, with the support of specialist naval architecture company Vard Marine, have been appointed by the New Zealand Ministry of Defence as the Technical Support Partner to the Southern Ocean Patrol Vessel (SOPV) project. Beca and Vard will join the Ministry’s Integrated Project Team providing systems engineering, concept design and technical logistics input for the early stages of the project as the capability is defined and specified.

The SOPV project is exploring options for a ship that is designed to operate in one of the harshest environments on the planet. An ice-strengthened offshore patrol vessel for Southern Ocean operations will be navigating the large distance between New Zealand and Antarctica, it will be traversing one of the roughest seas in the world, and must be able to operate safely in Ross Sea ice conditions. Any vessel that can meet these needs will require characteristics tailored to these demanding conditions.

New Zealand’s Otago Class patrol vessels, HMNZS Otago and HMNZS Wellington, were designed by Vard Marine and delivered in 2010. These vessels have operated in heavy sea states and ice in the Southern Ocean, and the SOPV is intended to provide improved operability in similar conditions. Vard Marine’s recent experience with the Antarctic Support Vessel for the Chilean Navy and the Southern Ocean research vessel for the South African Navy, along with similar projects for the United States Coast Guard, the Royal Canadian Navy, the Canadian Coast Guard, and the United Kingdom’s Royal Navy, all translates directly to this program.
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