Defence Business

Issue 49 Nov 2019 - Jan 2020

Cyber Security

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Lot Fourteen
Margaret Graham Building
1a Frome Road
Adelaide SA 5000
08 7320 1000
www.dtc.org.au

CEO
Audra McCarthy

EDITOR
Charlotte Butchart

Boylen +

THIS MAGAZINE IS PUBLISHED BY BOYLEN FOR THE DTC
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Adelaide SA 5000
08 8233 9433
www.boylen.com.au

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sales@boylen.com.au
08 8233 9433

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Henry Rivera

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From The Desk Of The CEO

Audra McCarthy
Chief Executive Officer

As this edition of Defence Business hits your desks, we will be entering the silly season, reminding me that 2019 is fast approaching a close and 2020 is just around the corner.

The recent AGM means the DTC has a new Board and I'd like to personally thank the outgoing Board members and welcome the new members. A DTC Board member is an honorary position, requiring a commitment of time, vision and energy to make the DTC the world leading industry association we aspire to be. Whilst we still have a long way to go with regards to gender diversity, the DTC Board is a diverse mix of representatives from industry, academia, professions and domains, which will enable the DTC to act with professionalism whilst remaining relevant and responsible to our members and stakeholders.

2019 has been a year of many changes for the DTC with the most significant being our final relocation to the Margaret Graham Building at Lot Fourteen. Some 22 years ago the DTC was formed and since its inception the DTC has been based at Mawson Lakes. Our decision to relocate the office into town, adjacent to the Defence & Space Landing Pad, presents a new era for the organisation. The DTC is now strategically placed amongst a hive of activity with entrepreneurs, representatives from space and now new-comers to town to the Defence & Space Landing Pad, providing us the opportunity to remain relevant and responsive to changes in the sector and adjacent sectors such as the space industry.

Seeing Australian industry grow and prosper is something that I am truly passionate about, and for this reason, I have volunteered to work with the AiGroup Defence Council to undertake a review of the Australian Industry Capability Policy. We don't believe the policy requires a major overhaul, but rather a few tweaks. It is evident that further education across the sector is required for industry to realise the full benefits intended by the policy. Education across industry, both domestic and international is required to provide clarity on the intent of the policy and how the policy is to be applied. Education across the project teams within the Department of Defence is also needed, as there are inconsistencies on how the policy is applied between projects. Most importantly, there needs to have greater accountability for ensuring AIC Plans are executed as contractually agreed. Presently there are no contractual ramifications for AIC Plan deviations and hence no accountability.

Our review of the AIC Policy with industry stakeholders, has highlighted growing concerns around industry's capacity to deliver both sustainment and acquisition projects simultaneously, as Australia embarks on a major industrialisation change program.

This is not to say that work has to go offshore, but rather in the early stages there will be occasions where we are going to need assistance from overseas experts to help show us the way. Greater skilled migration and collaboration between Australia and overseas businesses will be required to kick-start the change program. Robust transfer of technology plans will be required so that Australian businesses and staff will eventually have the skills and knowledge to lead the establishment of a sovereign shipbuilding industry, without undue dependency on overseas skills and knowledge.

To date the discussion surrounding the need for skilled labour has focused on the need for technical skills such as metal and electrical trades, welders and engineering. However, it's important, as an industry, that we don't lose sight of the need for enabling functions such as contract management, project management, procurement, security and quality, which if left unmanaged, will lead to a wages war in the sector. Underpinning the enabling functions are "soft" traits such as leadership, agility and adaptability. Skills that take time and experience to develop and are difficult to teach in a classroom. The DTC is the only defence industry association that is addressing this issue. For over 10 years, we have been delivering the SA Defence Industry Leadership Program (SADILP), which continues to go from strength to strength. And now, the defence sector has access to the Professional Certificate in Defence Industry Leadership (PC DIL), a postgraduate level program offered through the University of Adelaide. Graduates of the 2019 PC DIL have just completed the newest addition to the suite of leadership training now available to defence industry, which has been developed by the university in close consultation with the DTC. The defence industry sector now has a continuum of leadership training that supports the development of individuals as they progress through their career in the defence sector.

As the silly season slowly creeps up on us, I'd like to take the time to thank DTC members for their support and patronage over the year. The DTC is nothing without its members and I hope you and your families have a safe and restful Christmas break.

Yours sincerely,
Audra McCarthy
Chief Executive Officer

"2019 has been a year of many changes for the DTC with the most significant being our final relocation to the Margaret Graham Building at Lot Fourteen."

From left: Jemma Evans, Mathilda Grist, Vivien Massie, Les Shearn, Audra McCarthy, Emilio De Stefano, Charlotte Butchart, April McLennan, Lachlan Wray and Leigh Whicker

Defence Industry Cyber Security Summit 2019

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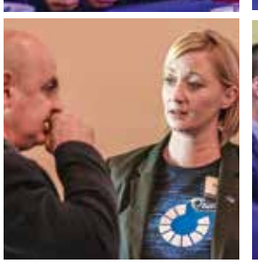




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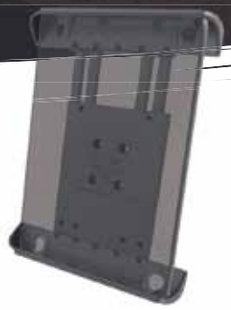

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The South Australian Defence Industry Leadership Program 2020

Expressions of interest are open for the DTC's South Australian Defence Industry Leadership Program (SADILP).

There has never been a more critical time to invest in developing your defence leadership skills, with industry set for exponential expansion in coming years, particularly in the areas of naval shipbuilding, cyber, electronic warfare and space. SADILP covers topics ranging from crisis management and the art of cooperation, to personal reflection and the psychology of leadership. The course is pitched at emerging leaders, with past participants coming from a broad range of defence industry sectors and leadership roles. Graduates of the program are awarded either a diploma or an advanced diploma in Leadership and Management, as well as a life long membership to the SADILP alumni.The next program will commence in April 2020. For more information or to express your interest, please email sadilp@dtc.org.au or visit **www.dtc.org.au/developing/**.

"It didn't feel like you were attending a class which demanded and expected output, rather I found it made me think about values, expectations, methods and tools that are available. In particular, the monthly sessions allowed me to take this information away and put it into practice."

PROFESSIONAL CERTIFICATE IN DEFENCE INDUSTRY LEADERSHIP

Developed by the University of Adelaide in conjunction with the Defence Teaming Centre, the Professional Certificate in Defence Industry Leadership is a postgraduate level course on core leadership skills in a defence-industry context. The course aims to develop participant understanding of the complexity of defence industry and multi-party collaboration, as well as self-leadership, self-awareness and change management. The program requires a total of 13.5 face-to-face days, including industry visits, presentations, and an immersive retreat in a key defence facility. Graduates will be awarded with a Professional Certificate in Defence Industry Leadership, which may then be used as credit toward an MBA at the University of Adelaide.

For more information or to apply for the 2020 program, please visit https://business.adelaide.edu.au/execed/courses-programs/professional-certificate-in-defence-industry-leadership.

Teaming Masterclass Workshop

The Defence Teaming Centre has been working with Knowledge Perspective's David Pender to deliver a series of teaming workshops, purposed with assisting businesses to develop strong collaborative arrangements and increase the competitiveness of their defence offering. A special thanks to Jones Harley Toole for generously hosting the October session.

Margaret Graham Building. Photo: Renewal SA

DEFENCE TEAMING CENTRE **RELOCATION**

The Defence Teaming Centre recently concluded its move from the Lot Fourteen temporary space into the Margaret Graham Building, alongside the Lot Fourteen Defence and Space Landing Pad. Located on Frome Road in the heart of Adelaide, the DTC joins the likes of Defence SA, Australian Cyber Collaboration Centre, Office of the Chief Entrepreneur and a range of other established and emerging defence businesses.

Cyber Australia: Time For Action

Edited highlights from a speech given by Alastair MacGibbon, Chief Strategy Officer at CyberCX, formerly Australia's National Cyber Security Advisor and head of the Australian Cyber Security Centre.

Tipping Point

Australia is at a tipping point in cyber security. No matter what we've done in terms of maturity, no matter what we've done in terms of accelerating our ambitions, we're still behind the curve. The threat surface has increased exponentially and we're moving too slowly.

Failed To Act

But why is it an existential threat? Not just because of the complexity - but because we continue to fail to act quickly and decisively.

In the online world, we have not yet to take the type of cultural, regulatory and resilience measures that we have yet adopted in the offline world. For some reason, we've convinced ourselves that, when it comes to technology and the online world, we need to be careful not to over-regulate.

When I was a police officer in cybercrime in the early 2000s, I made the case that ISPs needed to have more responsibility for protection of citizens online. Too often Australian regulators took a light touch approach, saying that we have to be careful, this internet thing might not catch on. How did that go? Given the scope and scale of criminal and harmful behaviour that occurs online, if this was any other social issue - and cyber security is better viewed as more of a social issue than a technological one – our lawmakers, business, regulators and individuals would be taking bold strides.

But we're not with cyber security. We know that there will be failure. And we know it'll be catastrophic. Yet we don't take action. We haven't learned. Our job is to reduce the likelihood of it occurring, and to deal with the consequences when it does occur. And we're not prepared for it.

Defence Supply Chain

There are several thousand companies in the defence supply chain. On a number of occasions, foreign powers have successfully gained access to certain aspects of our defence supply chain secrets. Attackers will always exploit the weakest link. Even what may appear as relatively benign elements of a defence supply chain, for example a metal fabricator or screw manufacturer, have significant impacts on projects critical to our national security. It is important that all aspects of the supply chain are trusted, secure, and most importantly, are what they say they are. Because cyber security isn't just about protecting secrets, or the confidentiality. It's also about the integrity of information.

How do we know in our defence supply chain that the information that's being passed to our subcontractors, or back up the line, is the information we expected it to be? What would happen if someone changed the dimensions of something even by a few millimetres? What would happen if you stopped being able to rely upon the integrity information or the availability of systems?

In many ways we're stuck. We're stuck in the paradigm of looking solely at the confidentiality of online information and not focused enough on its availability and integrity.

> "So we need to be smarter and I think there's a huge role for the private sector in protecting Australians."

Small Business Are Struggling

The Business Council of Australia needs to do more for the thousands of small businesses that employ millions of Australians. Few can sufficiently protect themselves against these things. Government can achieve more. I know, I've sat in government too. If this was physical terrorism, we'd expect government, police, special forces and others to be at the front line.

In cyber security it's flipped, and frankly, largely, it's the private sector. So we need to be smarter and I think there's a huge role for the private sector in protecting Australians.

Shared Responsibility

For far too long, government has pushed to the private sector, and the private sector has pushed to government, but no one has sat down and said that this is a mutual, social and national problem for us. If we don't do it, we will see that existential threat realised and catastrophic events occur.

National Imperative

There is a national imperative for us to get this right. It speaks to the heart of our national security and the risk threatens compromising multi-generational vastly expensive projects.

"The speed and churn in technology means our old ways of setting rules are dead."

If the secrets associated with ships, aircraft, submarines and land vehicles are compromised by potential enemies, then it poses a direct threat to those who serve in the Defence Force.

We owe it to those people. I don't think we're doing a good enough job of it. And I think our light touch approach has failed. And I say that respectfully to my colleagues in the government (where I very recently worked). That doesn't mean that standards and regulations will solve this problem. We continue to be too focused on confidentiality, and forget about integrity and availability. They are afterthoughts. We still have a mindset that thinks that our old systems of producing standards will work. The speed and churn in technology means our old ways of setting rules are dead.

We need to move to principles. So I commend Julie Inman-Grant, the Australian E-Safety Commissioner. She's promoting a concept called safety by design. In December, she was in the West Coast of the US trying to push big multinationals to embed safety by design in their products.

We should be embedding safety, security, and privacy by design. Fit for purpose devices that are designed with safety, privacy and security at heart.

Repercussions

We haven't done enough to drive costs into criminal operations. I've dealt with criminals my entire life, and in the online world too often they are given a free kick. The cost of criminal operations are nearly zero and the risk and consequences of being caught are near zero. The same is true for foreign nations.

We've got to get smarter and better at pushing cost in, through how we cooperate, through trade, through public discourse and through collective defence. When the Commonwealth Parliament of Australia was breached in February of this year, we quickly uploaded the code which was discovered to the global community, to drive the cost into the offender, another nation. That meant they couldn't use that exploit in other places.

5G Decision

I support the concept of excluding high risk vendors from the supply chain. When you read the press, and when you hear potential high risk vendors talking about this issue, they talk about the concept of spying. They talk about the concept of stealing information. What they don't talk about is the concept of availability.

Can someone just turn this off, flash the system and brick the product? The reason why the 5G decision was a smart one is that it gave us the best chance of protecting the integrity and availability of our networks. The loss of availability or the disruption of data poses a more catastrophic scenario than stealing stuff.

Victim Blaming

People continue to blame the victims of cyber incidents. We got rid of victim blaming offline years ago. You don't sit there and say the person deserved to be mugged. We all know there were things you could do to reduce the likelihood of being mugged. But we don't blame the person mugged. We go after the person who causes the harm.

ISPs Need To Do More

ISPs need to do a lot more. They're the ones that shift these ones and zeros, which means they can often best identify criminal and malicious behaviour. Too frequently they choose not to actively participate in the solution. There's an element of wilful blindness. In fact, they often would say we're the same as the postal carrier; we get the envelope, we deliver it. Sure it's got wires sticking out of it and it's waxy and it's ticking, but we just deliver it. In the online world it's 'well he asked for it, he clicked on it'. Offline it's illogical but online it's acceptable. This needs to change.

PACIFIC 2019

Here's what you might have missed at PACIFIC 2019

Agreements struck, major contracts inked and award winners crowned were among a whirlwind of announcements during PACIFIC 2019. With a record attendance, companies and countries vied for attention during the three-day event in Sydney. Here are the key announcements involving DTC members.

Navy Announcement

A much-anticipated event was the launch of the Navy Industry Engagement Strategy by the Minister for Defence Industry, Melissa Price and the Chief of Navy, Michael Noonan. EM Solutions was featured as an exemplary case study. See separate story on page 16.

Collins Class Submarines, HMA Ships Collins, Farncomb, Dechaineux and Sheean in formation while transiting through Cockburn Sound, Western Australia.

ASC and France's leading maker of submarine propulsion and power generation systems, Jeumont Electric, confirmed plans to establish a joint Australian presence to pursue future business.

They are seeking joint business opportunities across Australia's Collins Class and Attack Class submarine programs, as well as Australia's marine generator and rotating electrical machinery market.

Under a Head of Agreement (HoA), the companies will explore a range of commercial arrangements for future work, including formal joint ventures, teaming and other contractual arrangements. The HoA confirms earlier collaboration between the two companies, agreed at the 2018 Submarine Institute of Australia annual conference.

ASC Chief Executive Officer Stuart Whiley said the strengthening relationship with Jeumont Electric created natural synergies for the two leading organisations.

Jeumont Electric already supplies the main propulsion and power generation systems to the Collins Class fleet and is seeking to provide its advanced permanent magnet propulsion motors to the Collins Class life-of-type extension program and the Attack Class future submarine program.

The Tonsley Innovation District will be the site for a digital test and trial laboratory, announced by BAE Systems Australia, ASC Shipbuilding and Flinders University. The aim is to bring Industry 4.0 and advanced manufacturing to the Hunter Class frigates in South Australia's new digital shipyard.

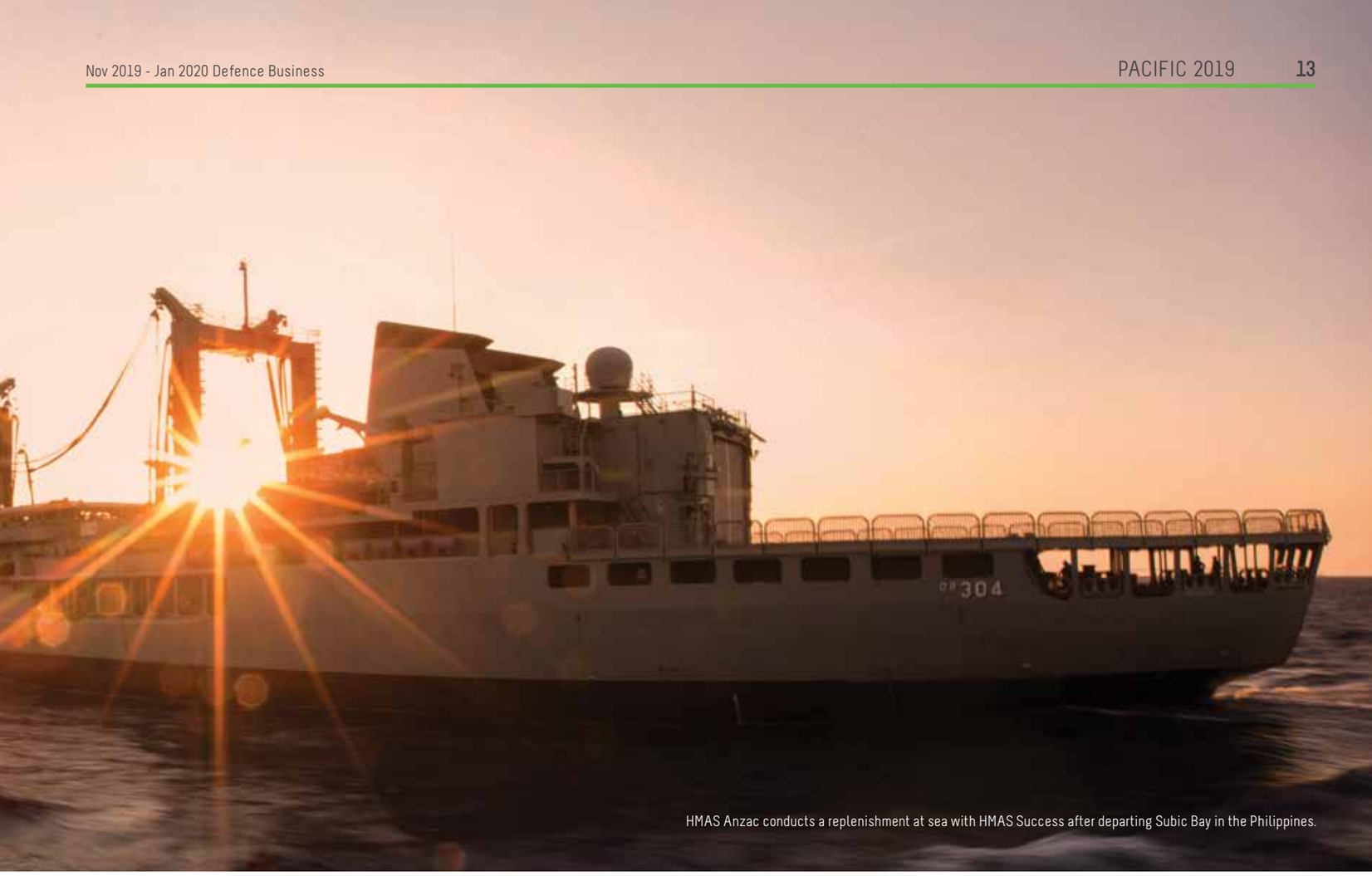
The laboratory will be part of Flinders University's advanced manufacturing research facilities.

In the SA-based laboratory, researchers, ASC Shipbuilding and suppliers will be developing and testing the technologies that future shipyard workers will use at the new digital shipyard, currently under construction within the Osborne Naval Shipyard precinct.

The partnership will bring together the latest technologies from industries such as mining, automotive and construction and they will be adapted, trialled and tested to suit the Hunter class frigate's design – specifically for prototyping, which commences in December 2020.

Naval Group and MacTaggart Scott Australia signed a Memorandum of Understanding for "the fabrication of countermeasures equipment and/or its associated launching system".

Naval Group Pacific is proposing CANTO anti-torpedo countermeasures for Australian submarines and surface ships programs (SEA 1000 Australian Future Submarine, SEA 5000 Hunter-Class Frigates and SEA 4000, upgrade



HMAS Anzac conducts a replenishment at sea with HMAS Success after departing Subic Bay in the Philippines.

of Hobart Class Air Warfare Destroyer). CANTO, the latest countermeasure generation based on Dilution/ Confusion multi-effects. It is an all-in-one broadband active acoustic emitter acting both as a jammer for dilution effect and as false targets generator for confusion effect. This system, fitted with its associated reaction module CONTRALTO, is already in service in the French Navy and in several blue-water navies.

Warrant Officer Layton with Mr Peter Richings, Managing director MacTaggart Scott Australia, receiving his award at the SIA Technology Conference in Adelaide 8-10 November.

MacTaggart Scott Australia is located in Adelaide and supports naval equipment on Collins Class submarines and Landing Helicopter Dock vessels. This manufacturing project will grow the company's contribution to the defence industry.

"This NDA is another step towards ensuring the sovereign capability of Australian defence," said Peter Richings, Director of MacTaggart Scott Australia.

BMT Defence and Security announced it would offer the Caimen 90 for Land 8710. Land 8710 Phase One is the program to replace the Australian Army's Mark 8 Landing Craft. The Caimen 90 was designed by BMT and is able to operate at high speeds with heavy payloads, allowing faster amphibious offload from host ship compared with slower, more conventional landing craft.

"BMT has offered world leading capability in landing craft vessels to the Australian Army with the Caimen 90," said BMT Defence and Security Managing Director, Peter Behrendt. A variant of this vessel is already being built internationally, which shows it is a proven hull form and design. The Caimen 90 represents a significant improvement on speed performance from previous landing craft vessels and is capable of traveling at up to 30 knots," he said.

"Additionally, features such as a tri-bow aluminium monohull and a bow and stern ramp, will allow for roll-on, roll-off capability, a key requirement for a modern landing craft.

iXblue and L3Harris Technologies signed a Memorandum of Understanding to strengthen iXblue's support system throughout the Australasian region.

iXblue has supplied its inertial navigation systems and subsea technology to many customers in the Australasian region, including to the Royal Australian Navy, for over a decade. As its regional customer base continues to grow, it is seeking to expand its regional support network and is investing in Australian industrial capability.

Together, the companies aim to deliver a scalable sovereign sustainment framework for the iXblue products used by the Australian Defence Force, as well as a greater support capacity in general for iXblue customers throughout Australia, New Zealand and the South Pacific.

iXblue, a global high-tech company specialising in the design and manufacturing of advanced navigation technologies, and L3Harris Technologies (NYSE:LHX), an agile global aerospace and defence technology innovator, just signed a Memorandum of Understanding aimed at strengthening iXblue's support system throughout the Australasian region.

Chief of Navy, Vice Admiral Michael Noonan, AO, RAN, (centre left) conducts industry engagement with employees of L3Harris at Sea Power 19 inside the International Convention Centre at Darling Harbour, Sydney.

Rugged Technologies MOU

System design and manufacturing company, APC Technology signed a memorandum of understanding (MOU) with leading UK specialist, AISH Technologies.

This will drive significant expansion of expertise and advanced manufacturing of rugged computing solutions for Australia.

Through its partnership with AISH Technologies, APC Technology will diversify its product offering to supply a range of rugged equipment and systems designed to perform and endure harsh military environments in line with the demands of next generation defence projects here in Australia.

Managing Director of APC Technology, Scott Begbie said the commitment and sharing of expertise by AISH Technologies will aid in the transformation and growth of its South Australian operations.

Tripling In Size

Plans are in place for the expansion of APC Technology's manufacturing facilities, with expectations to triple in size within the next two years. APC Technology's workforce is also projected to double in size as a result of the expansion and contract wins.

"With defence representing a significant percentage of our business and growing, the MOU provides opportunity for collaboration, knowledge sharing and capability development allowing us to deliver sophisticated equipment technology for the expanding needs of the Australian military industry.

"This includes our contribution to notable national projects SEA 5000, SEA 1000 and Collins Sustainment which will also influence future global partnerships and alliances secured by our business," said Begbie.

Matt Osler (AISH Technologies Business Development Manager), Scott Begbie (APC Technology Managing Director), Rear Admiral Hon Kevin Scarce and South Australian Premier Steven Marshall.

Raytheon has inked a new agreement with Defence to provide combat system engineering support services to the Royal Australian Navy for up to six years. It will support Defence's upgrades to surface ship combat systems by providing engineering and logistics services. Federal Minister for Defence Industry, Melissa Price, said it would capitalise on existing knowledge, skills, systems and processes developed by Raytheon Australia through the Hobart Class destroyer acquisition program, while continuing to support our Navy with the world's best combat systems technology.

"This is part of our Government's plan to develop a long-term sustainable Australian Combat Management System industry, which is key to the national Naval Shipbuilding Plan," she said.

Lockheed and Safran Signing

Lockheed Martin Australia signed a subcontract with Safran Electronics and Defense Australasia Pty Ltd (Safran) for the design of components for the Attack Class submarines. This will support the operation and sustainment of the Attack Class while maximising the involvement of Australian industry.

It is the first major equipment design subcontract awarded by Lockheed Martin Australia as the combat system integrator for the Attack Class. This includes the design of the optronics search and attack, navigation radar and navigation data distribution subsystems.

These are vital components of the combat system suite and builds on work Safran already conducts in Australia in the defence and civilian sectors.

Acacia Systems and Thomas Global

During the design phase, Safran will engage Australian suppliers Acacia Systems and Thomas Global Systems to provide design services. In the future, Safran will establish a local capability for the production, integration and support of these subsystems in Sydney.

Defence, Naval and Lockheed

An update on the Attack Class submarine program attracted over 700 Australian and international companies, research and development and educational institutions. The joint briefing was presented by the Department of Defence and the two prime contractors – Naval Group as the Platform System Integrator (PSI) and Lockheed Martin Australia as the Combat System Integrator (CSI). Attendees were provided with a detailed overview of upcoming procurement activities and how to get involved. Several of the Program's Tier 1 suppliers also spoke at the event:

- MTU and Penske Power Systems - awarded the contract for the design of diesel generator rectifiers for the Attack Class submarines; and
- Schneider Electric France and Schneider Electric Australia - awarded the contract for the procurement of the Main Direct Current (DC) Switchboards.

"The purpose of (the) briefing is to reinforce to Australian industry that they will be the first point of consideration for the delivery requirements of the Attack Class program at every point of the design and build phase," said John Davis, Chief Executive Officer, Naval Group Australia.

"To achieve this, we need to maintain a strong relationship with Australian industry to achieve long-term sustainable capability. Regardless of background industry, size or location, we want to hear from you."

"For the Attack Class submarines, we are looking to Australian industry to support all facets of our combat system integration work, not only with us but also with our appointed suppliers," said Joe North, Chief Executive Lockheed Martin Australia and New Zealand.

"At Lockheed Martin Australia it is our approach to work with Australian industry, small to large, to discover and evolve the best of breed technology and to build that capability for Australia and our global customers."

ASC and Naval Group

Naval Group also announced that it had selected its first three apprentices to be trained by ASC, Australia's dedicated submarine sustainer, from January 2020.

In the first placement of its kind, ASC will integrate the Naval Group Australia apprentices into its existing, highly competitive four-year fabrication apprenticeship program working on the Collins Class submarine program.

"During their time at ASC, apprentices will be exposed to over 30 years of experience, lessons learnt and a safety culture developed through the construction and sustainment of the Collins Class," said ASC Chief Executive, Stuart Whiley.

Naval Group Australia will lead the recruitment of the apprentices and will collaborate with ASC during the interview process to ensure those hired have the appropriate skills and values demanded of submarine fabrication.

The first intake of three apprentices will commence training with ASC in January 2020 for the four-year program.

ASC is currently training 53 apprentices across its South Australian and Western Australian operations, in fabrication, electrical and mechanical trades, as part of its 1300-strong dedicated submarine sustainment workforce.

Royal Australian Navy sailor Able Seaman Electronics Technician Nathaniel Mumme (right) and Leading Seaman Electronics Technician Kacey Neindorf (left) assist contractors from EM Solutions during a trial of the Tri-Band SATCOM terminal during the installation of HMAS Ballarat's new Wi-Fi network.

Awards

Ten Australian innovators won PACIFIC 2019 Innovation Awards.

EM Solutions was awarded the PACIFIC 2019 SME Innovation Grant and was highly commended in the PACIFIC 2019 National Innovation Award.

Both awards are associated with their Cobra X/Ka Tri-Band Maritime Satellite Communications Terminal.

"This is further, well deserved acknowledgement, to the Engineering and Operations teams at EM Solutions in Brisbane who have continued to strive for innovation excellence during the design, trialling and now operational deployment of our world leading mobile satellite terminals for defence and government users," said CEO Rowan Gilmore.

"The support of our end customer, the Australian Navy has been critical to ensure the capability delivered is aligned with requirements and that the outcome is leading-edge technology that is globally competitive."

Ultra Electronics Avalon Systems was awarded the PACIFIC 2019 Innovation Award for C4ISREW, Space, Cyber and Counter-Drone Systems.

Ultra Electronics Australia provides and supports a wide range of solutions and services across a number of domains, including electronic warfare, ISR, tactical communications, and maritime and underwater warfare

Avalon Systems was an Australian SME founded in 1995 was a leading provider of niche technologies and capabilities to the electronic warfare community. In 2009 Ultra Electronics acquired Avalon Systems as a base for building its Australian capability aligned with the awarding of the Air Warfare Destroyer (AWD) sonar contract.

Ryan McGrath, Thomas Churack and Jason Sardi from Thales Australia received the PACIFIC 2019 Young Defence Innovator Award for their design and development work on 'Bluescan' sonar sensor management system for the Hunter class frigate.

Navy Industry Engagement

Refocusing Navy's Links With Industry

The Navy Industry Engagement Strategy is an opportunity to regenerate, refocus and strengthen Navy's relationship with industry, according to the Chief of the Royal Australian Navy, Vice Admiral Michael Noonan AO.

"It is clear to me that we need to better define Navy's role as Capability Manager in engaging with industry, academia, and within the close partnerships that we have with defence policy and delivery partners," he said.

Midshipman Samantha Mellon provides aviation support during the refuelling of aircraft aboard HMAS Adelaide during Operation Render Safe 19.

CASG

"It is important to highlight that the key to successful execution of this strategy is Navy's commitment to not interfere with, or impede in any way, Capability Acquisition and Sustainment Group's primacy as the defence industry relationship lead, nor Strategic Policy and Intelligence Group's primacy as the Defence lead on industry policy.

"Navy's engagement with industry and academia will always be complementary to the work of all Defence delivery groups. Fundamentally, my aim is to reduce the separation between industry, academia and Navy, the end user.

EM Solutions was showcased as an example of "transformational partnerships in action" during the release of the Strategy.

The company's Cobra X/Ka Tri-Band Maritime Satellite Communications Terminal which has recently been deployed on numerous vessel platforms by the Royal Australian Navy.

The Cobra terminal was developed by EM Solutions in collaboration with the Australian Department of Defence and provides enhanced capability through its ability to operate on both military and commercial satellite systems and use of proprietary satellite tracking technology that ensures robust operation in the harshest of conditions.

Opportunities

Navy has stated that building a military maritime capability will lead to increased opportunities for technology creation, innovation, and exploitation in our country. It will lead to an increase in Australian industry capability and capacity and will involve more Australians and more small businesses as we deliver and sustain leading edge Navy capability.

Defence Minister Linda Reynolds, speaking at the Royal Australian Navy Sea Power Conference, succinctly summed up the challenge as "delivering a major acquisition program while accommodating emerging and rapidly changing disruptive technologies."

She said Navy could not deliver Australia's naval shipbuilding on its own.

"To succeed we need strong, trusted and reliable long-term industry partnerships – with our small and medium enterprises as well as with the primes.

"Industry must do its part – from research and development, to construction; from through-life support to disposal. We need construction infrastructure to deliver the projects; and the workforce to do everything from designing and building ships and submarines, to integrating combat systems and managing the complexity of major programs.

"Navy is at the centre of this effort as it sets the requirements, engages industry partners, oversees construction, delivers the vessels, then puts them into service – integrating them with the broader Fleet and the rest of the ADF.

"The fleet we need in the future will be far more than the capable platforms we currently have in service. The fleet of the future will need to be one that is integrated with the entirety of the joint force, capable of defending itself against everything from small boat swarms to cyber-attacks, and equipped with the intelligence to provide commanders with a clear decision-making edge."

Minister for Defence Industry, Melissa Price, reinforced this view: "I am also making engagement with small business a top priority as they will be helping the major defence industries to deliver on our major investment plan. I made the case for our defence industries in Washington and London in recent weeks."

The Chief of the Royal Australian Navy, Vice Admiral Michael Noonan, reaffirmed his strong commitment to partnering with defence industry to deliver Navy's capability needs. "My vision is for Navy, industry and academia to become better partners that focus on transformational relationships and shared awareness to enable the best possible outcomes for Australia," he said.

Component engineering and manufacturing. Photo credit: RUAG MRO International.

RUAG's Strategic Edge

Defence SMEs can take many lessons from studying RUAG Australia's forward-thinking business strategy. It embraces the changing nature of sustainment requirements and advances its surface finishing and additive repair technology capabilities to a range of current and legacy industry platforms, including the F-35 Joint Strike Force Defence Program.

RUAG is showcasing the flexibility needed to serve in multiple roles on behalf of the Australian defence industry. The ability to continually demonstrate precision manufacturing capabilities has secured it a role as a sole source supplier for the uplock actuator of the F-35 worldwide. It is also a major industry research centre and the acknowledged industry leader for the development and application of additive repair technologies (ART) for defence applications. These technologies offer a number of exciting and cost-effective solutions, particularly in the areas of geometry restoration and corrosion protection. Likewise, RUAG is engaged in providing in-country sustainment capabilities that ensure reliable, durable and efficient aerospace component finishing for large numbers of varying sized components. The consistently renewed dedication to ensuring reliable maintenance, repair and overhaul (MRO) support for mission-ready fleet availability, combined with their rigorous efforts in continuous improvement, see the company advancing to a significant role in life cycle support for in-country aerospace assets.

Advanced Repair Technologies

RUAG Australia's preferred repair methods include supersonic particle deposition (SPD), sometimes referred to as cold spray, and laser additive deposition (LAD) technologies. These technologies enable the restoration of corroded / damaged metallic components / structures to an acceptable level of structural integrity and functionality. When compared to traditional repair techniques, SPD and LAD are proven to improve component availability and reduce sustainment costs considerably. Specifically, SPD repairs to skin corrosion restore the stress field in the structure and ensure that the load carrying capability of the repaired structure is above proof load. This makes the technology particularly applicable to maritime and military aircraft, whose regular operating conditions include high stress performance and harsh environmental factors. Furthermore, RUAG Australia's use of LAD solutions on Australian Defence platforms rebuilds damaged metal surfaces and ensures that the component's return-to-service time, as compared with the typical replacement options, is significantly improved.

"Our team excels in the areas of aircraft availability and reduced life cycle costs," said Neil Matthews, Senior Manager Advanced Technology and Engineering Solutions at RUAG.

"For years now, we have been researching and leading the way in Advanced Repair Technologies, and making it successful, affordable and accessible on behalf of our Defence industry customers."

Finishing Capabilities

Focusing on cutting-edge technology for aircraft component structural repair, RUAG also offers its customers a state-of-the-art aerospace components surface treatment line and finishing paint booth facility, which provides reliable, durable and efficient aerospace component finishing capabilities for the processing of large numbers of varying sized components up to a diameter of 4.8m. Fully accredited by key aerospace partners, and externally by NADCAP, it supports the F-35 aerospace and Defence programs. The full high-specification, high-standard facility is engineered to ensure faster, high-precision finishing solutions for the application of aerospace paints, including waterborne epoxy and polyurethane, and fuel tank coatings, with improved and defined curing efficiency. The entirely automated processing line ensures prompt processing times, especially as it allows the finishing process to operate in all ambient weather conditions.


Additive Repair Technologies (ART).

Surface finishing.

Workforce

RUAG Australia has proven to be a very nimble and customer-centric company, renowned for recognising the changing nature of sustainment requirements and working to solve more complex and demanding standardised sustainment issues. This stems from its internal culture, where individuals and teams work together, solving complex problems, and developing workable and accurate solutions. RUAG teams are goal-orientated, and driven to continually developing the most precise, innovative solution for its customers.

"Our industry leadership is a genuine reflection of our people across the company, together with their knowledge and skill. They value our reputation for reliable service that they have developed and continue to cultivate over many years serving our customers," said RUAG Australia's General Manager, Terry Miles.

Hydraulic Centre of Excellence

Expertise in manufacture, assembly and testing of precision aerospace hydraulic actuators has led to RUAG Australia's certification and award as the sole source supplier to the new F-35 platform worldwide, with the manufacture of 27 components for the uplock actuator system for the bay door drive system. Additionally it manufactures key parts of the F-35 undercarriage system. In total, this represents some 200 components, across five technology groups. With continued investment in new machining capacity and application of 4.0 principles, RUAG has created new capacity and capability aligning with increased demand from global supply chains.

RUAG Australia F-35 MRO Sustainment Capabilities

RUAG investment in precision manufacturing processes, and applications, and their continued efforts in research and development in ART, represent key components of its overall position as a trusted, preferred partner to the ADF. It also underpins its role as a supplier, manufacturer, and MRO provider for system level support of the F-35 and Joint Strike Force (JSF).

The company's steadfast commitment to sustainable fleet availability is evident in more than 15 years of reliable MRO support to the RAAF's F/A-18A/B Classic Hornet fleet. Their proven MRO and life cycle support track record on for the ADF also includes 17 years on behalf of the AP-3C Orion platform.

Moving forward in next generation sustainment capabilities also sees RUAG participating in the collaborative and coordinated effort between the Australian Government, the Australian Defence Force, global partners, and Australian industry to achieve the F-35 MRO assignments. Bringing valuable certification to the coordinated efforts, RUAG Australia is a DASR Part 145, DASR Part 21J, EASA Part 145, CASA Part 145, and AS9100D approved organisation.

"The arrival of the first F-35 systems has galvanised the entire defence industry," said Terry.

"We are proud to be an integral part of this developing success and are dedicated to ensuring our people, our skills and our deep technology know-how remain highly relevant and sustainable to the benefit of Defence and our Defence customers."

Australia's defence companies have significant potential to grow into the space sector.

As an example of the interconnection of space and defence, DTC Member CyberOps will partner with Defence to determine how space technologies can be used securely for military operations.

The $299,000 contract will allow CyberOps to develop a security framework for nanosatellite development programs and operating systems.

"The contract with CyberOps aims to improve Australia's growing sovereign space industry by increasing the security and resilience of our military space systems," said Minister for Defence Industry, Melissa Price.

"Since its inception, the Defence Innovation Hub has invested more than $23 million in space related innovations ranging from nanosatellites to radar systems that will enhance space situational awareness."

Given this connection, it was a strategic decision for the DTC to co-locate with the Defence and Space Landing Pad and the Space Innovation Precinct at Lot Fourteen.

Nor was it surprising to see defence influencers at the 8th Space Forum in October.

The opportunities are clear. In the United States, more defence companies are moving into the space industry as the President pushes to "create a Space Force and recent moves by the Pentagon to stand up a Space Development Agency and a U.S. Space Command" says Space News.

In its 2016 Defence White Paper, the Australian Government announced that the Department of Defence would invest in modern space capabilities, and the infrastructure, information, and communications systems that support this vital defence capability.

More recently, the 2018 Review Of Australia's Space Industry Capability stated: "Australia's defence investment of nearly AU$10 billion in the next 20 years in space-related projects will also provide opportunities for Australian research and industry to contribute across a wide range of areas."

"Space offers tremendous potential for companies involved in the defence industry."

"Defence and space are tightly linked – and set to grow even tighter."

"Many of the Primes have well developed interests in both defence and space. This sets the example for smaller companies to look beyond defence to diversify their revenue streams."
- Audra McCarthy

Industry Input To Mission Control

Industry is having significant input into Australia's Mission Control Centre at Lot Fourteen. The South Australian Space Industry Centre has been working closely with the Australian Space Agency to ensure meets the requirements of industry, said the Centre's CEO and CE of Defence SA, Richard Price.

"Mission control will support not only joint national missions but, importantly, support local industry, and avoid them having to invest in duplicate infrastructure," he said.

"The Space Agency has undertaken public consultation on the proposed design, which received significant interest from industry.

"Feedback will guide the program design for the grant application process that opens later this year, with the successful applicants to build and importantly operate the centre."

Price used the recent Space Forum to announce that applications were now being accepted for a large tenancy in the McEwin Building at Lot Fourteen, to be co-located with the Australian Space Agency, the SmartSat CRC, Mission Control and the Space Discovery Centre.

He described it as "an excellent opportunity for space companies to establish here in Adelaide, a place many consider Australia's space capital."

"We're looking for space companies or leading organisations who will accelerate the gravity space industry for direct investments, the creation of new, highly skilled jobs and partnership with the South Australia Space ecosystem, and that's a really important point.

"What we're looking for is companies here that will contribute to growth of a whole sector within Australia."

"In the past year, three companies – Myriota, Innovor and Neumann - have already established in Lot Fourteen, further enhancing the precinct's reputation as a premier innovation hub.

"Lot 14 is a home to the SmartSat CRC, the Australian Space Agency, Space Discovery Centre and Mission control.

Venture Catalyst Space Incubator

Five start-up companies have been selected to take part in Venture Catalyst Space, a six-month incubator program to develop and grow innovative or disruptive ideas from entrepreneurs and startups in the space sector. It is Delivered by the University of South Australia's Innovation & Collaboration Centre.

"The program is now in the second year and successfully launched 10 companies in South Australia which is a great outcome.

Dr Megan Clark AC., Head of the Australian Space Agency

Space Agency Report Card

One of the key roles of Australian Space Agency is to "open doors" internationally and assist the Australian space industry to be able to "participate fully" in space projects. Dr Megan Clark AC., Head of the Australian Space Agency, said the Agency would assist "our researchers, our industry to share their ambitions with our partners around the world and to build jobs here in Australia and to get Australian ideas and technology into space". Recent achievements include:

Partnership with NASA

For the next nine months, the Agency will work with NASA to identify how Australian interests can become involved with "significant projects and partnerships" for the Artemis spaceflight program. Artemis 2 will be the furthest that humans have ever gone into space, while Artemis 3 will send a crew with the first woman and the next man to land on the moon by 2024.

European Space Agency

"We've already signed a letter of intent with the European Space Agency that highlights areas of cooperation... What we are working on and will require ratification and approval at their ministerial congress later in the year is for Australia to be able to participate much more fully on ESA missions.

The UK and Australia Space Bridge

"… we confirmed and announced with the United Kingdom to form the very first Space Bridge, and this is in partnership with the Department of International Trade in the UK and Austrade here in Australia to be able to support the transmission of ideas, collaboration and also support companies and research collaboration between the two.

"We'll be joined in that by the SmartSat CRC based here in South Australia and the UK Catapult program as significant partners. The next step for us now is to develop a full framework agreement on that, but a very exciting development that will assist industry and the increase in trade between our nations."

DTC Members Win Key Contracts

DTC Members Babcock and CEA Technologies have been awarded significant contracts with Defence.

Babcock Lands Key Naval Contract

The subcontract for another critical piece of equipment for the Future Submarine Program has been signed between Naval Group and Babcock for the procurement of the Weapon Discharge System (WDS) responsible for launching the Attack Class submarines weaponry.

In Australia, Babcock has been providing engineering and through life support for the Collins Class Submarine WDS since they entered service in 1996.

Babcock manufactured the WDS for the Collins class in Australia and provides support from bases in Osborne (South Australia) and Henderson (Western Australia).

Babcock has a dedicated team of highly skilled engineers, project managers and technicians serving the Royal Australian Navy and their submarine interests.

Babcock also supplied the Mk32Mod9 torpedo tubes for Hobart Class destroyers and other torpedo weapons launch systems for Navies around the world.

"Naval Group has worked closely with Babcock to develop an Australian Industry Capability Plan that maximises opportunities for Australian industry and enables the transfer of technology and knowledge to Australia for the WDS," said John Davis, Chief Executive Officer, Naval Group Australia.

"Babcock's investment in local infrastructure and intellectual capital will be critical to the success of the program and will ensure we create and sustain a sovereign submarine capability now and into the future," said Mr Davis.

While the preliminary design phase of the WDS will get underway in Bristol, United Kingdom, this work will initiate a transfer of skills and Intellectual Property (IP) to Australian engineers, who have already commenced secondments to the United Kingdom specifically for this project.

Shane Eckert is Chief Engineer for Babcock Australia's Defence Programs and is one of the engineers currently working in Bristol, United Kingdom.

"The WDS program is a great opportunity to work within an integrated design team comprising highly-skilled colleagues who have been designing, producing and supporting critical submarine systems for the Royal Navy for decades," said Mr Eckert. "While there is a lot to learn and achieve, having on the ground involvement and exposure to an international team is incredible. Knowing I am contributing to something much larger, something that will last beyond my own career is hugely rewarding."

CEA Technologies' radar systems on display on the HMAS Arunta.

As the Australians complete their secondments and rotate back to Australia, Shane and his colleagues will form part of the core Attack Class Engineering Design Authority which will see them use their knowledge to oversee the manufacture, assembly, test and support of the WDS in Australia.

Babcock will also manage the involvement of local suppliers to manufacture critical components for the WDS including mechanical, electrical and hydraulic components, assembly and testing. Babcock will add to its established local supply-chain, which has been supporting the Collins WDS for more than 20 years with new suppliers that have already registered interest on the ICN Gateway. Babcock will release more Expressions of Interest on the ICN Gateway early in 2020.

"Babcock is pre-eminent in the global submarine industry and the transfer of this class-leading IP, know-how and expertise – together with a significant investment in manufacturing, engineering and skills that will ensure the Attack weapons launch system is manufactured, built and sustained in Australia – is confirmation of Babcock Australia's commitment to grow our national defence and export industry; and continue to play our part in the security of this nation," said David Ruff, Australasia Chief Executive Officer. "We are proud suppliers to a critical sovereign capability."

"Babcock is a proven in service supporter for systems that have already been installed on the Collins Class submarine and Hobart Class guided missile destroyers," said Linda Reynolds, Minister for Defence.

"The subcontract with Babcock will support the operation and sustainment of the Attack Class while maximising the involvement of Australian industry."

"Our Government is committed to maximising local industry involvement in the Attack Class program to ensure Australians get the most out of this important national investment.

"Babcock will transfer the necessary Intellectual Property to its Australian subsidiary Babcock Australia to act as the Engineering Design Authority. This includes training, maintenance and managing the supply chain, creating around 170 new jobs for the build and sustainment of this system.

"Already, 220 Australian companies have been identified with the potential to become involved in this work following completion of the design phase.

"This is the fourth subcontract for major subsystems for the Attack Class Submarine established by Naval Group this year."

Radar Technology

CEA Technologies has signed a multi-million dollar contract with leading-edge Canberra company CEA Technologies Pty Ltd, for the supply of Army's new short range ground-based air defence capability.

The $137 million contract will provide advanced radars as part of the air defence system to protect our deployed forces from sophisticated air threats.

Minister for Defence, Linda Reynolds, said the Morrison Government is committed to providing the Australian Defence Force with the best capability to defend Australia's national interests.

"This air defence capability combines world leading Australian radar technology with a highly effective air defence system that will protect our service men and women from future airborne threats," she said.

"I congratulate CEA for adapting these radars from those already in service with the Royal Australian Navy, confirming its reputation as an agile, innovative company and a key strategic partner for Defence."

Minister for Defence Industry, Melissa Price said CEA was already a recognised success story for Australian industry.

"Integration of these radars into existing air defence technology is a significant step in establishing Australian industry as a leading exporter of defence technology," she said.

The contract with CEA will support 45 jobs in Canberra and Adelaide and demonstrates the company's ongoing success after securing a $90 million loan through the Federal Government's Defence Export Facility.

The vehicle-mounted radars will be delivered in long and short range variants, with the short range variant to be mounted on the Australian-developed Thales Hawkei vehicle.

Photo by Naval Group.

Defence Engineering Rising To The Challenge

The RAAF Classic Hornet fleet ticked over 400,000 flying hours during August 2019. Much of this success belongs to the technicians, engineers, aircrew, and logistics managers that have served in 81 Wing over the last three and half decades.

Australia's investment in naval shipbuilding is driving growth in advanced manufacturing, heavy engineering and specialised engineering work – and capability – in Australia.

After decades of fluctuating demand, defence-ready engineering firms are in the early stages of a golden age.

However, one of the challenges for the sector is the need for SMEs with engineering capabilities to grow, or to collaborate, to make them more attractive in the Primes' global supply chains.

In November, it was announced that Levett Engineering is being bought by ASDAM, owned by funds managed by CPE Capital. CPE Capital is building an integrated precision engineered products, solutions and sustainment company to support the Australian defence and aerospace industry.

The global engineering group SEGULA Technologies and Australian engineering consultancy GPA Engineering have joined forces to strengthen their naval offer in Australia.

By joining forces, the companies have the ambition to become a key player in the submarine project worth more than AUD$50 billion by delivering sovereign capability.

Headquartered in Adelaide, GPA Engineering is one of the largest engineering design firms in the region with more than 250 employees nationally. Operating in the heavy industrial sector, GPA provides multidisciplinary design and professional engineering services to the resources, power and renewables industries with a growing portfolio in the defence sector.

Another DTC member success story is Axiom Precision Manufacturing, which has made the move from automotive to aerospace and defence. It lists BAE Systems Australia and Boeing Defence among its clients.

Defence Industrial Capability Plan

Engineering's boom times are not confined to industry. The changing mindset also exists within the ADF. When he was the Chief of Navy, Vice Admiral Ray Griggs said "we have for far too long viewed engineering as an overhead and not as a mission enabler."

Like engineering itself, defence engineering is incredibly diverse, ranging from marine and mechanical to aeronautical, civil and software to manufacture and sustain a vast array of "equipment, weapons, vehicles, aircraft, ships and infrastructure".

The 2018 Defence Industrial Capability Plan cited the need for innovation and used Daronmont Technologies as an example of "Australian owned company specialising in design, engineering, integration and support of complex high technology electronics and software-intensive systems".

The renewed focus on expanding Australia's defence and space capabilities is providing a new world of opportunity for firms with engineering expertise.

DTC member Maxiport Engineering exhibits the required qualities, with a focus on precision machining, adding high quality to component manufacturing, CNC turning and multi-axis CNC milling to exacting standard of accuracy.

Mr Thomas Chambers from Standard Aero (Right) shows Aero Nautical Engineer, Flight Lieutenant Simon Kube from Air Lift Systems Program Office a part of the C-130 Quick Engine Change Unit in the Standard Aero workshop at RAAF Base Richmond.

Aircraft Research and Development Unit (ARDU), Flight Test Engineer Flight Lieutenant Dominic Camille, and Defence Science Technology Group (DSTG), Instrumentation Specialist Dr George Jung with the Energy Harvesting Unit.

The Federal Government also made it clear in the 2018 Defence Industrial Capability Plan that sovereign capability of complex engineering capabilities was critical, and that Australian industry must have the heavy engineering capabilities required for a continuous shipbuilding program.

"By 2028, Australian industry will be providing through life support for a range of aircraft and ships, supported by systems and software engineering upgrades ..."

Skills Shortage?

The need for a suitably skilled workforce won't just happen and several government-industry initiatives are paving the way, including the Defence Innovation Hub.

Engineering company Interconnect Systems praised the Hub's virtual nature: "the finest engineering minds the country (and world) over will have the ability to work together effortlessly – all the way from initial concept, right through to prototype, testing and entering service."

However, it warned that "though the Australia defence engineering sector does have a steady stream of fresh graduates to fill these gaps in the workforce, if current trends continue, that flow could slow to a trickle. Without the necessary skilled workers in place, the Department of Defence's grand plans for this sector could come to a grinding halt."

According to the University of Sydney, "there are more engineering jobs in Australia than skilled people to fill them.

"Between 2006 and 2016, the demand for engineers exceeded the number of local graduates.

"Employers often look overseas for suitable applicants, with some figures showing more vacancies are filled by overseas engineering graduates than locals."

Interconnect also noted that a mere 12 per cent of Australia's engineering workforce were women. Compared to 35% in Europe, and 50% in Iran.

"If Australia wants to keep its place as one of the world's leaders in defence engineering, this yawning chasm simply has to be narrowed."

Professional Engineers Australia sees it differently, calling on the Government to "act and improve engineering and technical capacity to deliver and maintain Defence capability.

"Skilled migration plays a crucial role in filling gaps in our national engineering capacity, especially when there are skill shortages.

"But at a time when there are no identified shortages, current government policy favours short term, lazy options which work against the interests of Australia in the long run.

"Experienced engineers are missing out on decent jobs, and increasing numbers of graduates are struggling to find their first. Overseas-born engineers currently experience more than double the rate of unemployment of domestic engineers, and only 55% stay working in engineering after arriving in Australia."

Dr Giuseppe (Joe) Fabrizio, a senior electrical engineer (right) and Dr Joachim Trinkle (left) with Dr Mayank Kaushik from the Defence Science and Technology Group, with the experimental phased array radar back end which is being developed at RAAF Base Edinburgh.

Education Concerns

This raises a whole set of questions about a home-grown, highly qualified engineering workforce.

"The future prosperity of Australia will depend on embracing new technology to address critical national challenges," said Australian Academy of Technology and Engineering President, Professor Hugh Bradlow.

The Academy has deep concerns about maths being taught by teachers without suitable maths qualifications.

"But the issue goes much deeper," he said. "We need to ensure high-quality, discipline-specific teacher training in all STEM subjects."

In other parts of the education sector, developments are more positive. The University of Adelaide and French education institution ENSTA Bretagne have collaborated to prepare skilled engineers for the Australian and global defence industries through a new dual master's degree. The degree will be offered in both Australia and France. Deputy Vice-Chancellor (Academic) for the University of Adelaide, Professor Pascale Quester, said the new master's program will look to attract engineers outside of the defence sector.

"Our new, dual Master's program will feed directly into the defence engineering skills base available to South Australia, as the state prepares for $89 billion of defence spending on submarines and surface ships over the coming years," said Professor Quester.

"The program will target technicians and engineers from Australia or internationally who are seeking to upskill or transition from other industry sectors, such as manufacturing."

The new, joint program with ENSTA Bretagne builds on over a decade of the University's successful Master of Marine Engineering program, delivered in partnership with Australian submarine and warship builder ASC.

Future prospects

Pure engineering businesses and firms that offer engineering as part of a multidisciplinary team to solve complex problems are in demand. With the growth in the likes of autonomous vehicles and digital transformation in defence, companies with a track record of delivering high quality, low risk projects can expect no shortage of opportunities in Australia for many years to come.

Defence State In Hackers' Crosshairs

With the exception of hackers that are motivated by "fun", the hackers of today are seeking a return on investment for their activities.

When it comes to cyber vulnerability, South Australia has a large target on its 'back'.

"… if you tag yourself as the Defence State, and you've got $90 billion worth of projects and a defence capability up there in the RAAF base, then it doesn't take a great leap of faith to understand that we will be targeted not only as a state and as a state government, but also all of the defence industry."

That is the warning from Reg Carruthers, Director Aerospace, Defence SA.

"We don't decide where frigates are built, we don't decide what frigates the Defence Force builds," he told the Defence Industry Cyber Security Summit.

"But it certainly behooves us to make sure that our state, and in conjunction with all of the other Australian states and key allies around the world, around Australia are in a position to ensure that the workforce and the companies are able to provide a secure supply chain.

"So we do have a very strong state strategy for cyber, which is protecting our own systems."

Cyber security is not an emerging threat; it is here and it is growing daily. Cyber security incidents cost Australian businesses up to $29 billion each year. The loss of intellectual property from US companies is estimated to be $250 to $300bn a year.

Primes and large companies have dedicated resources to fend off attacks. Smaller companies usually don't.

Former federal police chief Mick Keelty reviewed the vulnerabilities posed by defence contractors and this led to a recommendation that suppliers should be forced to adopt higher security standards in order to win contracts with the Department.

The Australian Security Intelligence Organisation had been directed to assist Defence contractors improve their security.

The Australian Cyber Security Centre (ACSC) says that while no single mitigation strategy is guaranteed to prevent cyber security incidents, implementing its Essential Eight "makes it much harder for cyber criminals to succeed".

But don't expect it to get easier.

"…5G will add deep fakes, real-time manipulation, and a new level of cybersecurity threats," says Zac Rogers PhD,

Members of No. 462 Squadron partake in Exercise Pink Pill - a Defensive Cyberspace Exercise.

a Senior Researcher at the Centre for United States and Asia Policy Studies, Flinders University in South Australia.

"A digital divide will open up. Those with the resources and wherewithal will have access to state-of-the-art products and services offered by an exploding cybersecurity industry. The vast majority will make do."

On the battlefield, the stakes are even higher: life or death. As Army Technology observed:

"Militaries around the world are also looking to enhance connectivity on the battlefield … Vehicles and soldiers are becoming more digitised with a raft of computer technologies that emphasise interconnectedness and data generation/sharing. As much as this digitisation will represent a capability enhancement, it will also increasingly represent a digital vulnerability for armed forces if they are not properly prepared for both defensive and offensive cyber operations."

Cameron Archer, Assistant Secretary, Cyber Affairs Branch, Department of Foreign Affairs and Trade.

We Are All In This Together

A month ago, News Corp reported that "ASIO is trying to protect major projects like the future submarines from foreign spies, but they say its capacity is outstripped by demand."

This stemmed from ASIO's annual report that revealed ASIO's growing workload assisting defence Primes, and small to medium-sized defence industry companies.

Attendees at the Defence Industry Cyber Security Summit would not have been surprised by the news. The first speaker at the event, *Assistant Secretary for Cyber Affairs, Department of Foreign Affairs and Trade*, Cameron Archer, had warned:

"…the Government doesn't have all the answers, the private sector doesn't have all the answers but bringing together the capacities that we all have is really the only way to make the best of the opportunities but also manage the risks."

Australian defence business is well aware that both countries and criminals are rapidly increasing their 'investment' in malicious cyber activities to achieve their objectives.

Australia's Federal and State governments are also ramping up their efforts in an attempt to protect national interests – but it will never be a magic bullet solution.

Intellectual Property

Cameron said the Australian government was focused on "creating the conditions in which prosperity can be increased".

These include pro-digital trade rules within free trade agreements and the harmonisation of regulations and international policy seeking to protect intellectual property.

"We've also reiterated that an international law applies online just as it does offline," he said.

Another key strategy is working closely with Australia's international cyber security partners, law enforcement agencies and with business to kind of build cyber resilience.

"We start from this perspective that there must be consequences for those who contravene the rules of behaviour in cyber space," he said.

"It's a work in progress and a great deal of effort will be needed to combat the growing trend of malicious cyber activity."

Opportunity

"Why do we do it? It's because we want stability… because that's what's fundamental for states and businesses and for individuals to take advantage of the opportunity presented by cyberspace.

"So we've established a clear acceptance of standards but I think it's true to say that the more work needs to be done to enforce those rules and punish breaches?

"We've been partnering with countries to deter malicious behaviour in cyber space. The Government has pointed the finger at a number of countries over the last few years for engaging in unacceptable behaviour in cyberspace."

Regional Role

Australia is also playing a regional role, noting that "many of our regional counterparts are facing a relentless cycle of cyber crime within their own borders and it is having a measurable and significant impact on their economic growth".

This has seen Australia collaborate and share "practices, tools, techniques and ideas" to assist regional partners.

"It was once really considered to be just a technical issue but it's now a strategic international policy issue and frankly there's scarcely a key issue that international governments grapple with that doesn't have a cyber component…"

Penny Clarke, BAE Systems Australia, Security Lead For Protective and Information Security.

Gus Campbell, BAE Systems Australia, Infrastructure and Security.

Cybersecurity In BAE Systems Australia's Supply Chain

How do Primes likes BAE Systems Australia assess the cyber security credentials of potential suppliers?

This year, seven Primes have agreed on one common, risk-based survey (C3FDI) to assess the cyber credentials of potential suppliers. It saves considerable time and resources for SMEs, who previously had to go through a similar, laborious process with each Prime.

C3FDI - common core cyber framework for defence industry - is a set of common questions. There are approximately 30 multiple choice questions and applicants are advised to choose the answer that is the closest fit.

"It's meant to be a tool to help industry," said Gus Campbell who heads up infrastructure and security at BAE Systems Australia.

"It's the responsibility of those bigger Primes to really help out the small to medium enterprises.

Risk Table

The answers allow the Primes to measure the responses in the form of a risk table which determines the likelihood of a cyber event in a given company.

They then work with internal and client stakeholders to determine the consequences of a breach "and then make a decision internally about whether we want to play on with that organisation".

"If it's in the red section of the table, I'll give you a hot tip, we're probably not going to play," said Campbell. "If it's in the green, then we are.

"For example, if a company is selling us taps, then probably the consequence of a cyber breach is going to be low. But if we're talking about a turbine, then we're probably going to see a consequence as extreme or high."

He said Primes needed "visibility over the supply chain and we want to see the maturity of the entire supply chain.

"We're only as strong as the weakest link in that supply chain. So we really need to be honest with ourselves and understand what the risks are in that supply chain.

"C3FDI is free, and it does provide you an opportunity to sell into other home markets and an opportunity to interact with other Primes."

BAE Systems Australia is a member of the Defence Industry Security Program (DISP) and Penny Clarke is the company's security lead for protective and information security. Prior to joining BAE Systems Australia, she had 25 years' experience in government and industry as a security manager and executive. Following this, Clarke led a national security governance, risk and assurance practice delivering consulting services to Government and Industry.

"It's critical to BAE that our customer trusts us to deliver defence capabilities securely," she said.

"This is achieved through our approach to protective security, including cyber.

"The outcomes that we're continuously striving to achieve is that we have systemic and resilient security within our integrated supply chain.

"So we not only have confidence at the first level of the supply chain, but at the subsequent layers underneath."

Cyber Capability

She mentioned a wide range of areas that are "applied downstream through our supply chain", including governance, people information and physical security, assurance and risk management, personnel, a security culture, and education and training. Clarke encouraged companies to apply.

This would require them to assess their security capability and consider where they would acquire that capability.

"Do you have the expertise in house? Do you need to bring it in externally? There are key appointments that need to made internally within your company, and you can't outsource those appointments.

"However, there are deliverables you can certainly outsource if you don't have the expertise. There are some consultants and service providers out there who can provide immediate capability to assist as well."

Clarke followed this up with the question: "Have you performed due diligence on your security suppliers as well?

"When engaging consultants and external expertise, do they in turn have supplier arrangements which make your information vulnerable. At the first level of the supply chain, it might look good, but not at the subsequent levels."

What Australia Can Learn From Maryland, USA

Maryland is regarded as the "Cyber Capital of America," home to 1,200 private sector cybersecurity companies. Its universities are issuing more cybersecurity degrees than any other state in America and it is home to the National Security Agency and the U.S. Cyber Command.

An early-mover in recognising the importance of information security as a strategic industry, Maryland's government has built global cybersecurity relationships with partners such as Israel, the United Kingdom, the Netherlands, South Korea, Estonia... and now Australia.

Following his address to the Defence Industry Cyber Security Summit, Maryland Governor Larry Hogan signed a Memorandum of Understanding with SA Premier Steven Marshall.

The goal is to foster strong economic and security ties, particularly in the cybersecurity and satellite technologies sectors. The agreement, which will be in effect for three years and may be extended, will encourage collaboration and support investment and trade activities.

Workforce Shortage

In May, Premier Marshall visited Maryland on a cybersecurity and satellite technology fact-finding mission that included visits to the University of Maryland Baltimore County Center for Cybersecurity and the National Cybersecurity Center of Excellence.

"The principal thing that we learnt was the importance of getting the skills right," he said.

The Premier said Australia has a deficit in cyber security skills "and we can't import them from somewhere else because the world has a deficit of these skills.

"So this is a race, this is a race to see who can actually get the skills in place as quickly as possible."

He praised the way Maryland had systematically consulted with potential employers regarding the qualifications required from graduates, especially as cyber is fast moving and requirements change quickly.

"Most recently statistics have been published that say we need nearly 18,000 more qualified cyber people in Australia by 2026, so we've got a lot of work to do," he said.

"We've had excellent pickup and we're wanting to work with the industry as much as we possibly can to really realise the full potential of cyber in South Australia.

"We've got a lot to learn from what they've done in Maryland and… we are delighted that they are willing to share that with us."

Governor Hogan said Maryland had an "unparallel pool of cyber security and technology workers" and "a workforce that includes the highest concentration of doctoral scientists and engineers in America".

"We've made it a priority to provide the tools that companies need to be successful including incentives to make it easier for cyber companies from outside the United States to come to Maryland to set up shop."

This includes a 12-month incubator program to help international companies establish a foothold in the US market.

Flip Side

Premier Marshall acknowledged that "yes, cyber is a threat… but the flip side of that threat is opportunity and there are plenty of opportunities in the defence sector and virtually every other sector Australia. I can't wait to realise that full potential."

"By forging connections with Maryland and learning from their success, we're seeking to grow this rapidly expanding sector right here in South Australia," he said.

"We are working to bring together these fast-moving sectors in South Australia, by providing companies with unparalleled collaborative opportunities, and bringing them within proximity of other major players in their fields."


Photographer: Steve Kwak

Last year, TAFE SA launched a Certificate IV in Cyber Security. Twelve months later, it is the organisation's fastest growing course, with a 1360% growth rate from 5 to 73 students, with the advent of the new Cyber Traineeship pathway.

Real Companies, Real Collaboration

Maryland is home to the likes of BAE Systems Australia, Boeing, Lockheed Martin and Northrop Grumman.

During his visit, the Governor visited Lockheed Martin to see how the company works in another country. He also held a series of meetings with Australian business leaders "to discuss how our two regions might expand further on our commerce and trade relationships".

"America and Australia have fought side-by-side in every conflict for the past 100 years, but our mateship is also rooted in our shared vision for the future, and that vision depends upon us confronting common threats," said Governor Hogan.

"There are incredible things being done here in South Australia when it comes to aerospace, defense, and cybersecurity, and the state of Maryland shares many of these very same strengths.

"Through collaboration and cooperation, we can better address the rapidly emerging and evolving cybersecurity challenges facing our nation and the world."

Another US Company At Lot Fourteen

Industry links between Australia and the United States continues to grow, with US-space company Tyvak announcing a presence at Lot Fourteen, establishing a manufacturing facility for the integration and testing of space vehicles.

Tyvak is a wholly-owned subsidiary of Terran Orbital Corporation, a global leader in the miniaturisation of space technologies.

Premier Steven Marshall said the company will establish itself in the Defence and Space Landing Pad at Lot Fourteen, giving them unprecedented collaborative opportunities with other like-minded organisations.

Tyvak has unveiled its first Australian ground station antenna at Nova Systems in Peterborough. In February it entered into an agreement to build nanosatellites for Myriota, another major boost to the local supply chain.

Director of Tyvak Australia, Dr Marco Villa said Tyvak looked forward to supporting more local organisations and continuing to provide solutions for Australia's space needs.

"By hiring local talent, tapping into local resources and applying our agile aerospace processes, we aim to accelerate commercial and defence space missions while growing the local supply chain and national space ecosystem," Dr Villa said.

Aerial view of the displays at RAAF Base Edinburgh Air Show.

Industry Shines At Air Show

The Australian Defence Force's most advanced military aircraft and technologies were on display at Adelaide's RAAF Base Edinburgh at the 2019 Edinburgh Air Show.

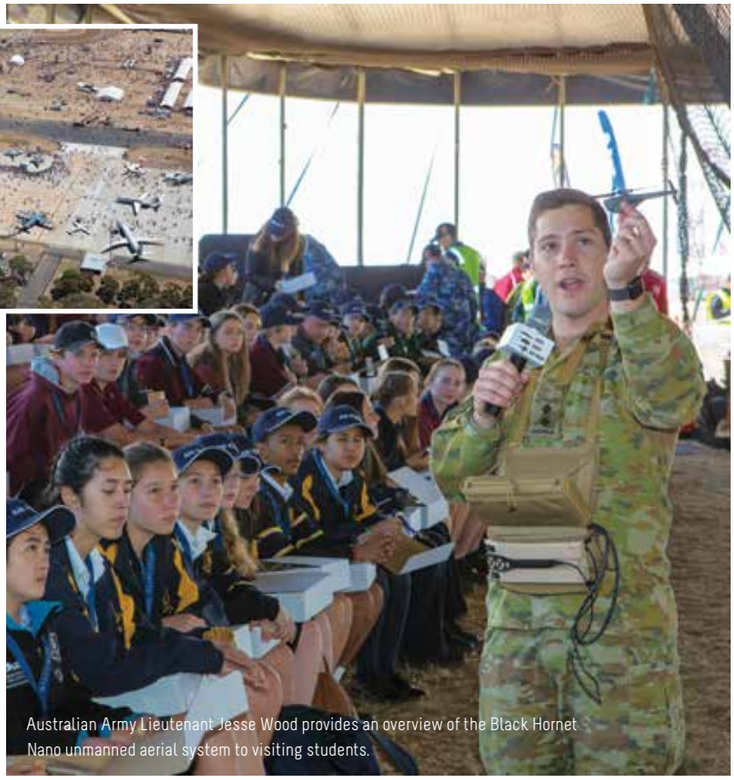
This included Australia's newest maritime patrol aircraft the P-8A Poseidon, alongside jets such as F/A-18 Hornet Fighters, latest fifth generation fighter aircraft the F-35A Lightning II, and Defence technologies in addition to historic and vintage aircraft

This year's Air Show commemorated 100 years since brothers, Sir Ross and Sir Keith Smith, made their first flight from England to Australia in a Vickers Vimy WWI Bomber aircraft in 1919 to win the Great Air Race.

STEM

More than 700 South Australian regional and metropolitan high school students and Navy, Army and Air Force cadets took part in the ASTRO-STEM Day at Edinburgh as part of the Air Show.

Defence joined South Australian academic institutions and industry partners to stage high tech interactive displays promoting STEM and careers in aerospace.



Australian Army Lieutenant Jesse Wood provides an overview of the Black Hornet Nano unmanned aerial system to visiting students.

SA Veterans' Employment program

The Defence Teaming Centre joined Veterans SA on 1 November to launch the South Australian Veterans' Employment Program as part of the 2019 Veterans' Information Day, at the Torrens Parade Ground.

Digital shipyard

In support of Naval Group's Digital Shipyard vision, Flinders University will conduct a range of research trials including applications of mobile machining robots and exoskeleton technologies, providing assistive manufacturing capabilities in shipbuilding for improved quality, safety and productivity. Francois Romanet, CEO of Naval Group Pacific and Professor Colin Stirling, Vice-Chancellor of Flinders University welcomed the partnership saying that this ground-breaking 'Industry 4.0' research program will help to establish a world leading advanced manufacturing capability at the Osborne shipyard in South Australia. "The establishment of this partnership with Flinders University is part of our commitment to ensuring shipyards are able to access the early deployment of the most advanced digital and advanced manufacturing technologies available", said Francois Romanet.

School students get on board with naval shipbuilding

The Naval Shipbuilding College has launched a national learning program in secondary schools to ensure students can prepare for the thousands of exciting career opportunities ahead.

Through a partnership with the Work-Ready program, an online careers education platform, students will access the latest advice on future educational or training pathways that lead to exciting jobs.

Using specific naval shipbuilding focused modules, teachers can educate students about the skills, knowledge and capabilities required to secure rewarding and meaningful careers.

"Through the Work-Ready program we will ensure that a skilled Australian workforce is available to meet the future needs of the naval shipbuilding, supply and sustainment industries. New career opportunities will soon spawn throughout Australia, offering jobs across a diversity of disciplines, from fabrication roles in the construction yards, through to engineering roles in the design bureaus, and leadership opportunities within management teams," Naval Shipbuilding Institute Chief Executive Ian Irving said.

Publisher of the Work-Ready program Tracy Marsh, said it will provide a conduit between schools, teachers, parents and the Naval Shipbuilding College. "Due to its reach, Work-Ready will allow young Australians from diverse backgrounds to tap into opportunities they have never have been aware of previously," Ms Marsh said.

What triggered Anzacs' last stand?

Flinders University historian Professor Peter Monteath has issued a new book profiling some of the brutal realities that face Australian troops in battle.

The Battle of Crete, one of the most spectacular military campaigns of World War II, is the subject of his book Battle on 42nd Street: War in Crete and the Anzacs' bloody last stand.

The Battle of Crete in May 1941 signalled a nexus point in modern warfare. For the first time in history, German forces carried out an invasion entirely from the air, while poorly equipped Anzac and British forces, and local Cretans, defended the island. The Germans introduced hi-tech Stuka dive-bombers and paratroopers landing en masse, but the Allied forces were largely equipped for old-fashioned close-quarters combat.

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New DTC Directors

Congratulations to the newly elected, and re-elected, DTC Board Directors - announced at the DTC 2019 Annual General Meeting. Thank you to all members who took the time to make a considered vote.

Newly Elected Board Members

Lee Kormany - Nova Systems

Over the last 20 years, Lee has held several management positions, ranging from engineering management roles through to her most recent position at Nova Systems as General Manager - Maritime, Land and Future Systems. Prior to joining Nova, Lee serviced in the Royal Australian Navy for 21 years as a Weapons Electrical Engineering Officer, transferring to reserves in 2015. For nine years, (2009-2018), Lee was the co-owner and Director of a small business in Victoria and is currently the Deputy Chair and Treasurer of the St Thomas Mores Primary School Community Council.

As a dynamic, team-spirited and performance driven management and engineering professional, Lee aims to accomplish the goals of an organisation by applying her extraordinary blend of leadership and industry knowledge. Lee is passionate about supporting the development of the Australian defence industry, and in particular, connecting small businesses to opportunities and maximising the use of the skills Australia has to offer. It is through SMEs that Australia can solve complex problems of national interest.

With the ADF undertaking the largest recapitalisation program since WWII, and a commitment from the Commonwealth Government to spend $200bn, Australia now has a unique opportunity to build a vibrant, enduring Australian based defence industry. However, this can only be achieved through ensuring that Australian businesses see the potential of this future and the part they can play in delivering sovereign capability to defence by participating.

Lee is also passionate about building capacity in the Australian workforce to support the large bodies of defence work. It is critical that emerging professionals be exposed to the future career opportunities in the defence industry and that we ignite the imagination of children, such that they can see themselves working to support the ADF and the future defence industry. The Defence Teaming Centre also shares this passion.

The DTC are a leader in connecting Australian businesses to Defence primes, and in advocating for academia to offer educational courses and research that supports the future needs of the industry in the coming Defence projects.

As a representative of Nova Systems, Lee is well placed to understand the challenges faced by Australian businesses and believes that she can support the Defence Teaming Centre, as a Board member, to grow in its mission of connecting, developing and advocating for defence industry.

Adam Watson - BAE Systems Australia

Adam Watson is a Campaign Director for BAE Systems Australia with over 20 years of global experience in leading and managing complex organisations. He commenced his career as an Army Officer serving for 14 years in the USA, UK, South East Asia, the Middle East and Australia. His current role is focused on winning future business. As a campaign manager, Adam has led several international tendering efforts for complex military platforms totalling over 30 billion dollars.

As a general manager, Adam has led businesses of over 350 personnel with full profit and loss responsibility within a several hundred million dollar project environment. Since 2006, Adam's experience has been in large FTSE 100 and ASX 100 engineering organisations within the defence, rail and infrastructure sectors. Adam performed for two years as the Australian Industry Manager for the BAE Systems Australia Global Access Program focusing on securing multi-million dollar export purchase orders for Australian defence small to medium enterprises.

Adam is a qualified and chartered member of the Chartered Institute of Procurement and Supply. He has been actively involved in several industry associations and committees such as the Civil Contractors Federation, the Institute of Public Works Engineers, Defence in Business, Australian Defence Industry Association and the Defence Teaming Centre. Adam is a graduate of the Royal Military College Duntroon, and holds a Bachelor of Management and Master of Business Administration from the Southern Cross University.

Adam is a passionate supporter of Australian Industry Capability in the defence sector and hopes to bring a range of experience to support the mission of the DTC. Some of my most rewarding roles have been in the trenches helping Australian industry secure, and prepare to execute, export contracts within global defence programs. Australia has significant Defence projects to execute in the near, medium and long term; and he believes the DTC must work to connect, develop and advocate for its members' success. As the Australian Government seeks to achieve 2% of GDP as Defence spending, Adam is excited by the opportunity to contribute to the DTC's mission as a board member.

Juniper Watson - Piper Alderman

Juniper, who took over from former Vice-Chair Tim O'Callaghan in September 2019, was returned at the 2019 AGM. Juniper is a commercial lawyer and has worked for Piper Alderman since her admission in February 2007. Juniper's practice incorporates the commercial negotiation and documentation of infrastructure and capital projects, and she is experience in avoiding and managing disputes arising out of these contracts. This experience enables her to provide a continuity of service throughout the life of construction and infrastructure projects - from procurement to completion.

Juniper completed a Master of Laws through the University of Melbourne. This further study complimented her practical experience and served to further develop Juniper's specialist legal knowledge. Her conscientious approach ensures that she communicates in a comprehensible and timely manner, alive to commercial consequences and proportionate to the risks and exposures involved. With experience as a Board Member and Risk Management sub-committee member for Playgroup SA, as well as numerous committee positions, Juniper has also undertaken AICD training in Governance Foundations for Not-for-Profit Directors.

In particular, Juniper believes she can provide valuable assistance in the identification and management of risk. Board, committee and professional opportunities have enabled her to develop skills in identifying risks as well as working cooperatively with others to develop strategies to appropriately allocate, mitigate and manage those risks.

As both a professional service provider and a parent, Juniper is enthusiastic about supporting Australian industry with a view to increasing employment opportunities both now and in the years to come. Juniper believes in the importance of the work that DTC is doing to support the defence industry and the positive flow on effects that is has on other local industry.

Juniper brings considerable skills, strengths and values to her board and committee positions. She is a conscientious, enthusiastic and engaged team player. As a female, Juniper offers a diverse perspective. She also believes in the importance of preparation and education when tackling new opportunities. These values align with the objectives of the DTC in its work to assist with the growth and development of industry participants.

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