

DEFENCE WEEK AUSTRALIAN DEFENCE MAGAZINE SERVING THE BUSINESS OF DEFENCE **PREMIUM EDITION**



The RAN has two Camcopter S-100 platforms and associated equipment under management.

SCHIEBEL

Schiebel Pacific opens Australian office

Katherine Ziesing | Nowra

Building on a strong foundation of partnership, Schiebel Pacific has opened its new office and workshop at the Albatross Aviation Technical Park (AATP), right next door to the RAN and local partner Air Affairs Australia (AAA) in Nowra.

This new Schiebel Pacific facility at the AATP provides direct access to the airfield and other industry partners.

"We realised very quickly in the wake of [Navy Minor Project 1942](#) (Navy's unmanned experimentation program) that we needed to establish a true local presence," Fabian Knechtel, Schiebel Pacific Managing Director said.

As part of the Memorandum of Understanding (MoU) signed at the opening, Schiebel Pacific and AAA have agreed to collaborate on the compilation and submission of Request For Tender (RFT) responses for Remotely Piloted Aerial System (RPAS) opportunities in Australia and the Pacific region, as well as the subsequent close cooperation in contract delivery, support and services.

"Building on our current contracts, we see enormous potential in Australia for Schiebel and our unrivalled Camcopter S-100 RPAS due to several significant

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upcoming programs and working with established Australian companies will be key to success,” Hans Georg Schiebel, Chairman of the Schiebel Group, said. “A strong physical presence through Schiebel Pacific and a MoU with a strong partner are logical steps in preparing for the tremendous opportunities in Australia, a nation at the forefront of embracing robotic technology and modernizing its Defence Force.”

Schiebel’s Camcopter S-100 is currently under contract for NMP 1942, with the RAN having two platforms and associated equipment under management. This

evaluation program aims to develop the RAN’s understanding of the capabilities of an advanced Vertical Take-off and Landing (VTOL) Tactical Unmanned Air System (TUAS). Schiebel Pacific is working closely with the RAN on achieving all the goals of the project, while simultaneously preparing for the upcoming tenders for Land and Sea 129. As ADM has [already reported](#), the RAN will be the first customer to use the newer av-gas engines.

Another two platforms are in use by Army under a [lease arrangement](#) and will be testing sensor packages in the upcoming Talisman Sabre exercise. The Army testing focuses on multiple payloads, including the L3 Wescam MX-10, ELTA Systems’ ELK-7065 Compact Airborne HF COMINT/DF 3D System, Overwatch’s Multi Spectrum Imaging TK-5 and Leonardo’s PicoSAR radar.

To make sure that the Camcopter gets to Army in one piece, Schiebel Pacific and AAA have also been working with Victorian engineering SME Fordham to develop a new transport solution (pictured).

“We needed to make sure that all parts of the RPAS arrived in good order and ready to go,” Peter Krueger, Fordham’s General Manager – Defence and Aerospace said. The older wooden carry box just wasn’t cutting it, with the new solution able to be tied down on any platform with shipping container attachment points.

Schiebel Pacific and AAA have engaged a local fibreglass company for repair work on the outer skin of the Camcopter in the wake of a recent cracking incident for Navy. Covering their bases, Schiebel Pacific have ordered a new tail from Austria while also repairing the existing tail in Australia.

“A strong physical presence through Schiebel Pacific and a MoU with a strong partner are logical steps in preparing for the tremendous opportunities in Australia”



Victorian engineering SME Fordham’s new transport solution for the Camcopter.

KATHERINE ZIESING



A concept image of the Praetor 600 AEW.

EMBRAER

Embraer launches P600 AEW platform

Nigel Pittaway | Melbourne

One of the surprises of the 53rd International Paris Air Show at Le Bourget last week was an announcement by Brazilian aircraft manufacturer [Embraer](#) and IAI/Elta of Israel that the two companies will partner to market a new airborne early warning (AEW) platform.

Known as the P600 AEW, the aircraft will be based on Embraer's Praetor 600 executive jet and fitted with an Elta Active Electronically Scanned Array (AESA) radar, with integrated Identification Friend Foe (IFF) capabilities, mounted on the top of the fuselage.

The Praetor 600 is a recent development of Embraer's popular Legacy 500 business jet, which gained triple certification, from Brazil's Agência Nacional de Aviação Civil (ANAC – National Civil Aviation Agency), the European Union Aviation Safety Agency (EASA) and the Federal Aviation Administration (FAA) in the US, in May 2019.

The aircraft, in its executive jet configuration, is capable of accommodating up to 12 passengers and has a range in excess of 4,000 nautical miles (7,408 km), according to Embraer's brochure figures. The aircraft operates in the 'super mid-size' business jet category and, although the Praetor program was only officially launched in October 2018, Embraer reports that production is already sold out through May 2020.

The P600 AEW is designed for a new segment of the AEW market and aimed at nations which cannot justify high-end surveillance platforms such as Boeing's 737-based E-7 Airborne Early Warning and Control (AEW&C) aircraft.

Under the co-operative program announced at Le Bourget on June 18, Embraer will be responsible for supplying the Praetor airframe as well as ground support, communications systems and aircraft integration. Elta will supply the radar, Signals Intelligence (SIGINT) and Electronic Warfare (EW) systems and systems integration.

Embraer said the P600 AEW can be configured with “the full range” of AEW&C sensor and control systems, including fourth-generation AESA radar, civil and military IFF, Electronic Support Measures/Electronic Intelligence (ESM/ELINT) with Radar Warning Receiver (RWR) capability, Command & Control, communications suite (including SATCOM), a datalink and “robust” self-protection systems.

“This aircraft delivers superior performance and flexibility that translates into the greatest value proposition in its category,” Jackson Schneider, President & CEO of Embraer Defense & Security, said. “It can easily be configured to match the customer needs and it can perform a wide variety of missions in a very efficient and cost-effective way.”

Discussions are presently underway with a number of potential customers, according to Embraer.

Embraer has a track record of producing niche AEW systems, beginning in 2002 with the delivery of five R-99A platforms, based on the company’s successful ERJ-145 regional jet and fitted with an Ericsson (now Saab) Erieye AESA radar, to the Brazilian Air Force. The aircraft and radar combination is also operated in small numbers by Greece and Mexico.

The five Brazilian Air Force aircraft, together with three remote-sensing R-99B variants, were acquired as part of the Brazilian Government’s Sistema de Vigilância da Amazônia (SIVAM - Amazon Surveillance System) program. The AEW&C aircraft were redesignated E-99 in 2008 and Embraer is currently upgrading the fleet to E-99M configuration, complete with an enhanced Erieye radar, mission systems, C² systems, EW suite, IFF system and provision for the next generation of Brazil’s sovereign datalink capability.

“The P600 AEW is designed for a new segment of the AEW market”

PEOPLE ON THE MOVE

AIDN ACT has announced its new board of directors: Stuart Althaus (Chairman); Bernadette Brown (Deputy Chairman); Graham Priestnall (Managing Director); Sonya Hogan (Treasurer); and directors Emily Frizell, Warren Williams, Ella Dion, Mike Johnson and Anthony Borgo.



A swarm of over 500 drones illuminates the sky over Travis Air Force Base, California.

US DEP DEFENSE

The rise of the robot in Defence

Lincoln Parker | Sydney

It is often said that Australia punches above its weight; we do more with less and we seem to do it well. And sometimes, we lead the world. We just don't talk about it much in our tall poppy culture.

In the field of advanced defence technology, we are indeed leading the world on a number of fronts. In a series of articles, I'll be delving into some of the cutting edge Australian research and development.

To kick off, the biggest game changer of them all; collectives of smart, thinking, coordinated autonomous systems and artificial intelligence (AI). In short, robots. Once they were just for the dull, dirty and dangerous jobs but advances in adjacent technologies mean that their application in the Defence sector can go [well beyond](#) these basic roles.

I recently sat down with Associate Professor Robert Fitch at the University of Technology Sydney (UTS) to explore these themes. Prof Fitch heads up the School of Mechanical and Mechatronic Engineering and has been working in this field for over 20 years.

Global Award

This year in Montreal, Prof Fitch's team won the Best Paper Award in Service Robotics at the International Conference on Robotics and Automation (ICRA). It's the largest robotics conference in the world with over 4,000 attendees and around 3,000 papers submitted. What did Prof Fitch and his team do to win? They produced the best known mathematics for enabling robot systems to work together in collecting information and making decisions in a timely way

(i.e. gathering massive amounts of data, sharing it, analysing it, and then make decisions in real time, and doing it quickly).

"We are giving robot systems the ability to start to have more human-like ways of understanding the world in terms of gathering data from their sensors, and make decisions in real time that allow them to complete their mission," Prof Fitch explained to *ADM*.

Prof Fitch uses the term "multi robot systems" rather than swarms, but essentially the mathematics he and his team are developing allow teams of robots to work together to understand objects in the world at small and large scales and

coordinate their actions in a very tightly coupled way, fast and in real time. And, he explains, "we've demonstrated that in the defence domain." For obvious reasons we can't say much more than that here.

"We are giving robot systems the ability to start to have more human-like ways of understanding the world"

Battlefield apps?

Prof Fitch explains the cases he has worked on involve on the ground activities in semi-urban environments where there may not be valid maps.

"Imagine a team of robots, without any centralised controller, on the ground and in the air with sensors, LIDAR, radar, cameras, hyper-spectral etc., identifying objects and reporting back," Prof Fitch said. "The system itself has a task and the robots have to make decisions that collectively achieve the mission with each robot depending on the other."

One can only imagine what an advantage these capabilities will provide our military, and it's only getting better, more advanced and potentially more lethal as we progress. Chief of Army's [Accelerated Warfare](#) concept is closer than we think.

Over the next few months I'll highlight other disruptive technologies, companies, universities and the people in Australia that truly lead the world.

Note: Lincoln Parker works for the NSW Defence Innovation Network (an initiative of the NSW Government, Defence Science & Technology Group and seven NSW universities). The author's views are his own.



Professor Fitch's team develops maths that allows groups of robots to understand the world.

MISSION SYSTEMS

Great power competition takes centre stage at ASPI

Naomi Thomas | Canberra

One of the topics covered in depth at ASPI's [War in 2025 conference](#) was the geo-political realities of great power competition between China and the US in Southeast Asia. As the alliance system stretches, the cracks between Chinese and US influence are expanding.

The notion that nations have to pick and choose their team is simple. Yet Australia is entering a dangerous period of a prospective cold (possibly hot) war between major powers, and could face a hard choice between China and the US.

Global relations between China and the US are changing, according to Dr Willy Lam, Adjunct Professor at the Chinese University of Hong Kong. The imbalance of regional alliances and the closing trade gap between the two great powers has led to much uncertainty on both sides which has flowed into the geopolitics of the region.

"China [will close] the gap with the US [as soon as] 2021," Dr Lam said in respect to their economic size and power. "China is driving a wedge in the Western alliance via trade and alliances."

Dr Lam explained the implications of China's 13th five-year plan of economic and social development, which was released in 2017. The plan is seen as a shared vision amongst the people of China.

"The five-year plan involves integrating the Chinese military with civilian sectors, including universities," Dr Lam said. "Uniform standards will be placed in civilian institutes. All Chinese citizens are potential soldiers."



The gap is closing between the US and China.

US DEP DEFENSE

Chancellor of the University of Queensland Peter Varghese spoke about the unlikelihood of China and the US forming any sort of alliance. Speaking from his experience as a High Commissioner to Malaysia and India, secretary of DFAT and Director General of the Office of National Assessments, Varghese brought unique perspective to the conversation.

"The US may not remain the most influential power on the globe," Varghese said. "China will become a stakeholder and have more influence on old and new institutions. The US is entering a dangerous period, and they have no sensible alternatives to engaging with China. China's rise needs to be managed, and a balance of power needs to be shaped."

"Australia is entering a dangerous period of a prospective cold (possibly hot) war between major powers"

Many countries aren't happy as this battle for dominance affects smaller regional players. Senior ASPI analyst Dr Huong Le Thu spoke about Asia's struggle to deal with great power games between China and the US.

"India will be guided by its own interests while building ties," Dr Le Thu said. "If Japan cuts ties with the US it's because they've lost faith in their security."

"Southeast Asia doesn't want to choose between the US and China, but some nations have," Dr Le Thu continued.

"We have to bet on one, resist and self-strengthen, and navigate between the two. It's about making alliances and laws."

"Southeast Asia wants to benefit from both sides without any of the downsides. The choice narrative is not simple. But Southeast Asia likes to think of themselves as victims of great power competition."

In the post-Trump era, many predict that international relations with the US will once again become less isolationist. Yet domestic issues within American political parties are causing permanent tensions and divides. It will also take time for policy positions to be reversed and not all policies will change, even if the US government does.

"Polls in the wake of the 2016 election found that politicians thought that the greatest threat to their democracy was sitting on the other side of the aisle," ANU's Dr Jennifer Hunt said. "Their greatest issue is internal rather than external."

MOST READ ONLINE AT WWW.AUSTRALIANDEFENCE.COM.AU



1. [Upgrades underway on air defence radars](#)
2. [Raytheon officially taps Kongsberg for NASAMS](#)
3. [Bids open for Hunter class prototypes](#)
4. [Commonwealth signs NASAMS acquisition contract](#)
5. [Unmanned surface vessels network off NSW](#)

EPE is removing soldiers from the danger zone

Ewen Levick | Sydney

EPE, a Brisbane company that develops technologies that allow soldiers to detect mines and dangerous substances from a distance, has secured a \$300,000 grant through the Defence Innovation Hub.

"EPE is an Australian SME which is working to protect and save lives on the international stage," Minister for Defence Industry Melissa Price said in a statement. "Small and medium sized firms are every bit a part of our defence industry as our major partners.

"This funding will help EPE to improve its radar technology used to identify and track IEDs."

EPE has three projects developed through the Hub. The first is the 'Amulet' ground penetrating radar integrated onto the Talon unmanned ground vehicle, which is able to clear a one-metre wide safe lane from buried mines and IEDs. The second project is an enhancement to Amulet to allow it to map and mark the explosive threat, which then gives commanders on the ground options for dealing with the threat, and to reduce its reliance on GPS.

"The TTPs (tactics, techniques, procedures) for mine clearance haven't changed since WWII," EPE project manager David Rye told *ADM*. "So this is all about removing the individual from the danger zone by adding detection capabilities to unmanned ground vehicles."

According to Rye, the challenge in creating a mine detector robot was integrating two separate operating systems – the ground penetrating radar and the robot – without compromising the performance of either.



Minister Price and Trevor Evans with Warwick Penrose (right) of EPE during a site visit.

EPE

"Now that we've achieved that, we know this solution is scalable," Rye said. "This can go much smaller or larger to meet the need specified by the customer."

The company is aiming to develop a prototype for Defence to trial before the end of 2019.

The third project is the Maritime Portable Raman Improvised Explosive Detector (PRIED), which provides naval boarding parties with the ability to detect narcot-

ics, explosives, homemade explosives (HME), chemical warfare agents, toxic industrial chemicals, toxic industrial materials and related chemical precursors from a distance.

"When we first [took this out for trial](#) we'd thought we'd get a ten metre stand-off capability at best," Rye said. "We actually got 50 metres. So that was a pretty good day."

Whilst the technology holds much promise, Rye told *ADM* that EPE needs to shrink it so that it can be used in one hand whilst maintaining a stand-off distance of at least ten metres. The company is working with industry partners on the challenge and aims to have a result in the second half of next year.

When asked about whether EPE had plans to export either technology, Rye said that their focus remained local.

"There's certainly been interest from outside Australia," Rye said. "But as an Australian company, the ADF remains our core focus."

"EPE is an Australian SME which is working to protect and save lives"

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Tonga takes delivery of Guardian class patrol boat

The Australian government has handed over a new [Guardian-class patrol boat](#) to the Kingdom of Tonga.

The Tongan Royal Navy's *Ngahau Koula* was received by Crown Prince Tupouto'a 'Ulukalala and Captain Sione Ulakai, Tongan Deputy Chief of Defence Staff, at a ceremony in WA.

Minister for Defence Linda Reynolds said the replacement of the Pacific Patrol Boats is an important part of the Government's \$2 billion 30-year commitment to the Pacific region under the Pacific Maritime Security Program.

"The Australian Government is delivering 21 new Guardian-class Patrol Boats to 12 Pacific Island nations and Timor-Leste, as well as delivering improved maritime surveillance capability to our Pacific partners," Minister Reynolds said.

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

"Tonga is one of Australia's key partners in the Pacific region and we work closely together to address regional maritime security threats," Minister Hawke said.

"Tonga's military plays an important and active role in the security of the region.

"The enhanced capabilities of the *Ngahau Koula*, together with other maritime surveillance and law enforcement operations, contribute to the Pacific community's efforts in securing the sea."

The new 39.5 metre steel hulled patrol boats are designed and built by Austal in WA.

"Tonga's military plays an important and active role in the security of the region"



Assistant Minister for Defence Alex Hawke co-signs the handover certificate with Crown Prince Tupouto'a 'Ulukalala. DEFENCE

Forthcoming Events

ADM EVENTS

More detail on **ADM** Events can be found on our dedicated website:

- [Women in Defence Awards](#) – 11 July 2019
- [ADM STEM and Defence Summit](#) – 14 August 2019
- [ADM Defence Estate and Base Services Summit](#) – 12 September 2019
- [ADM North Australian Defence Summit](#) – 23-24 October 2019

DTC Defence Industry Dinner & Awards Ceremony 2019

Date 04 July 2019

Location Adelaide Convention Centre

Website dtc.org.au

The Defence Teaming Centre's Annual Defence Industry Dinner & Awards Ceremony is the premier event of its type and last year attracted more than 540 guests, from more than 200 companies. The event is well attended by both State and Federal Government representatives, defence primes and industry SMEs who connect and network throughout the evening.

ITAR, EAR and Australian Export Controls Training

Date 04 July 2019

Location SMC Conference Centre, Sydney

Website www.internationaltradeadvisors.com.au

International Trade Advisors is proud to offer our third annual training on US and Australian Export Controls. The one-day workshop is focused on how these regulations affect Australian industry. It will be held on 4 July 2019 at the SMC in the Sydney CBD.

The Future of Australia-Indonesia Relations in a Contested Indo-Pacific Order

Date 05 July 2019

Location Tattersalls Club, Brisbane

Website www.rusi.org.au/event-3331760

This seminar is RUSI Queensland's blue-ribbon event for 2019. Constant examination of the Australia-Indonesia bilateral relationship is required to understand the dynamic shifts in political, diplomatic and social foundations of these two close neighbours. This year provides a special opportunity to recalibrate the strengths and weaknesses in this key regional relationship.

Women in Emergency Services, Enforcement & Defence Leadership Workshops

Date 9-10 July, 24-25 July, 30-31 July

Location Sydney, Brisbane & Adelaide

Website www.eventbrite.com.au/e/women-in-emergency-services-enforcement-defence-leadership-workshop-tickets-59135290245

The Defence Force, Emergency Services and Enforcement agencies are the cornerstone of a functional society, ensuring the health, safety and wellbeing of the communities they serve. The high pressure and ever-changing nature of this work requires a unique blend of reactive and proactive leadership skills and an awareness of not only how to deal with a situation, but to ensure the safety and wellbeing of your team. This two-day workshop explores resilience, stress and confidence as weapons in the leadership arsenal, and will give you the ability to apply them to their own behaviours and work.

Women in Defence Industry Panel Discussion and Report Launch

Date: 11 July 2019

Location: Parliament House

Website: www.eventbrite.com.au/e/63362167950

If defence industry is to meet the projected growth in demand for skilled workers, it must become an employer of choice for all segments of the workforce. This means finding new ways to attract and, just as importantly retain, women with critical skills. Facilitated by Dr Samantha Crompvoets, the panel will discuss challenges and opportunities for defence industry organisations - from four different vantage points - as they reflect on career choices, and/or prepare their workforce and workplace to take advantage of these growth opportunities.

AIDN QLD Annual Gala Dinner 2019

Date 18 July 2019

Location Figs on Sylvan Toowong, Brisbane

Website www.eventbrite.com.au/e/2019-aidn-qld-annual-gala-dinner-tickets-61677344598

Join guests from across the Australian SME community, Defence Primes, Defence Force and industry organisations for an evening of unmissable entertainment, great food and wine. The event will feature keynote and guest speakers from Defence and Industry.

Defence Maritime Environment Working Group

Date 24 July 2019

Location National Gallery of Australia, Parkes, Canberra

Website www.business.gov.au

The Maritime Environment Working Group (MEWG) is a forum for engagement between Defence and the Maritime Industry to consider opportunities for innovation and collaboration early in the capability life cycle. It provides an opportunity to test the strength of capability requirements and proposals, to inform industry regarding future capability programs and challenges and to foster the development of Navy's capability modernisation program.

ADM Essington Lewis Awards

Date 31 July 2019

Location National Convention Centre, Canberra

Website www.defence.gov.au/casg/dplusi

ADM's Essington Lewis Awards will return to the National Convention Centre on Wednesday 31 July 2019 to recognise excellence in Defence projects. The event is limited to the first 1000 attendees wishing to network and interact with Defence and defence industry leaders, celebrate the achievements of their peers and be entertained by our celebrity MCs. This black tie gala event is not to be missed!

Defence + Industry Conference

Date 01 August 2019

Location National Convention Centre, Canberra

Website www.defence.gov.au/casg/dplusi

The Defence + Industry Conference is the premier Defence and industry conference held in the national capital. Consistently attracting in excess of 1100 delegates to hear from Defence and industry leaders discussing collaboration in the acquisition and sustainment space. Thursday 1 August will see the National Convention Centre come alive with informative, thought-provoking presentations from Defence decision makers and industry leaders, along with interactive Q&A sessions and networking opportunities.

DST Scindicate 2019: Partnering for Impact

Date 15-16 August

Location Adelaide, SA

Website Scindicate@dst.defence.gov.au

Once again, industry, universities and research agencies are invited to participate in the two-day activities which will include technology demonstrations, business matchups, workshops, briefings and laboratory tours, as well as opportunities for networking and forging new collaborations. A Next Generation Technologies Fund Showcase will be a special feature of the event.

PGCS 2019

Date 20 – 22 August 2019

Location The Canberra Rex Hotel, Canberra

Website www.pgcsymposium.org.au

Now in its 7th year, PGCS 2019 will focus on ways to build the foundations needed to create project and program success. Creating the organisational capability needed to underpin the consistent delivery of successful projects in the 2020's starts at the top. Leadership and a sustained focus are required to build a culture of excellence that can balance innovation with surveillance and accountability, encourage learning, and manage knowledge effectively.

Hunter Defence Conference 2019

Date 23 August

Location Crown Plaza Hunter Valley

Website www.trybooking.com/book/event?eid=503298

The 2019 10th anniversary Hunter Defence Conference will focus on driving collaboration between Defence Primes, NSW regional SMEs, academia and the Department of Defence. Key presentations at this year's conference will include capability development staff from Army, Navy and Air Force Headquarters, Defence Primes articulating the support requirements they will have over the coming decade from regional SMEs. Former Minister for Defence Christopher Pyne will present a keynote at the dinner.

Australasian Simulation Congress

Date 02 – 05 September 2019

Location Gold Coast Convention and Exhibition Centre, Gold Coast

Website www.simulationcongress.com

The Australasian Simulation Congress provides a focused opportunity for industry development, business growth, training, discussion and distribution of information related to Simulation, Modelling, Training and Decision Support. Simulation Australasia can help you directly engage with industry, policy makers, Government and relevant stakeholders to facilitate you and your organisation achieving the success only a truly international Congress can provide.

Synthetic Environment Working Group (SEWG)

Date: 06 September 2019

Location: Gold Coast Convention and Exhibition Centre

Website: www.defence.gov.au

The Synthetic Environment Working Group (SEWG) 2019 is a one-day Conference/Working Group sponsored by the Department of Defence, ADSTC and managed by the Simulation Governance Directorate.

Army Innovation Day 2019

Date: 25 September, 2019

Location: Adams Auditorium, ADFA

Website: <https://www.army.gov.au/>

AID19 will be held on Wednesday, 25 September 2019 and the purpose is for selected respondents to diSchiebel Pacific ay and pitch their proposed innovations to assessors, Capability Managers and Defence Innovation Hub personnel. Respondents may also be able to verify, validate and clarify their Request for Proposal response. Request for Proposal submissions closes on 3 September 2019 and on 12 October 2019 respondents will be notified of outcomes.

Australian Cyber Conference 2019

Date 07-09 October 2019

Location Melbourne Convention and Exhibition Centre

Website cyberconference.com.au

The Australian Cyber Conference 2019 will provide business leaders with insights and best practices taught by the industry's top experts through keynotes, panel sessions and live demonstrations. Attending the conference will enable you to network with these practitioners to help you better understand and manage current threats, as well as identify and prepare to meet emerging challenges.

Pacific 2019

Date 08-10 October 2019

Location Sydney Convention Centre

Website www.pacificexpo.com.au

As the only comprehensive international exhibition of its kind in the Indo-Asia-Pacific region, PACIFIC 2019 will again provide the essential showcase for commercial maritime and naval defence industries to promote their capabilities to decision-makers from around the world.

2019 Parari Australian Explosive Ordnance Safety Symposium

Date 05-07 November

Location ADFA

Website parari@defence.gov.au

This year's symposium brings together delegates from around the world to discuss the latest innovations and advances in explosives, munitions and weapons safety. International and local experts from industry, academia, military and government will share their research to explore Explosive Ordnance Safety opportunities and challenges as a community.

MilCIS 2019

Date 12-14 November 2019

Location Canberra Convention Centre

Website www.milcis.com.au

In November each year, the Defence Chief Information Officer Group (CIOG) partners with the UNSW Canberra and the Institute of Electronic and Electrical Engineers (IEEE) to present MilCIS. The annual Military Communications and Information Systems (MilCIS) Conference welcomes military and government organisations, academia, and defence industries to contribute to the future direction of military communications and information systems.

SubSTEC 5 Conference

Date 18-21 November

Location Esplanade Hotel, Fremantle

Website www.submarineinstitute.com

The 5th Submarine Science, Technology and Engineering Conference (SubSTEC 5) will be held at the Esplanade Hotel, Fremantle, WA 18th-21st November 2019. The theme of the Conference will be: 'Innovation and Investment in the Sub-Sea Environment'. SubSTEC5 will be held with the support of the Institute of Marine Engineering, Science and Technology (IMarEST).

Corrosion and Prevention 2019

Date 24-27 November

Location Crown Promenade, Melbourne

Website conference.corrosion.com.au

Corrosion and Prevention 2019 will bring together leading researchers and industry practitioners who combat corrosion daily. Diverse technical streams will showcase the latest developments in corrosion, ranging from fundamental corrosion science to hands-on application.

Rotortech 2020

Date: 16-18 June 2020

Location: Royal International Convention Centre, Brisbane

Website: <https://www.rotortech.com.au/Index.asp>

RotorTech 2020 is the region's premier helicopter and unmanned flight systems showcase and forum, bringing together operators, manufacturers, suppliers, regulators and government across the Indo-Asia-Pacific. With a comprehensive three-day free industry conference program, RotorTech 2020 will also feature manufacturers technical workshops and an industry exhibition showcasing more than 100 helicopter and unmanned flight related companies.

Land Forces 2020

Date 01-03 September 2020

Location Brisbane Convention Centre

Website www.landforces.com.au

The biennial LAND FORCES exposition is an international industry event to showcase equipment, technology and services for the armies of Australia and the Indo-Asia-Pacific. The Land Forces 2020 team is now setting about ensuring the event will achieve its goals of providing an effective platform for the exchange of ideas on key land forces issues and of taking Australian industry to the world.