

ADM DEFENCE WEEK

AUSTRALIAN DEFENCE MAGAZINE

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PREMIUM EDITION



CAPT Martin Arundel inside a prototype of an Electronic Warfare Bushmaster variant.

BOEING

Boeing showcases latest battlefield comms capability

Nigel Pittaway | Brisbane

Boeing Defence Australia showcased the latest iteration of battlefield communications capability it is delivering to Defence under [Project Currawong \(Land 2072 Phase 2B\)](#) on May 17.

Project Currawong is a scalable distributed battlespace communications system which is developing a single converged IP network between strategic and deployed systems, from headquarters down to the commander on the move on the battlefield.

The demonstration was held at HMAS *Moreton* on the banks of the Brisbane River, as part of the latest in a series of Mission System Integration Test Events Boeing has held since being awarded the \$650 million acquisition contract in 2015. Visitors to the VIP event on May 17 included Myra Sefton, Director General Communications for CASG.

The capability is being rolled out through two major releases of capability, but uses agile development methodology to design, field, test and if necessary

IN THIS ISSUE

Boeing showcases latest battlefield comms capability	1
Internet of Things firmly on ADF's horizon	3
Titomic unveils world's largest 3D metal printer	5
Defence launches autonomous systems research centre	6
Rolls-Royce turbine for Japanese frigates	8
Australia shows interest in UK Galileo replacement	9
Forthcoming Events	11

improve the capability through a series of iterations. "Agile development methodology applied to system engineering and hardware and software development is all about short, fast iterations, where you build the prototype product, get it in front of the customer and validate functionality early," BDA's Currawong project development director Lee Davis explained.

This latest test event is the 14th in the series and the first major test of Release 2 capability, which achieved Initial Materiel Release (IMR) in December 2017.

The site was set up to represent a battlefield headquarters (Brigade Main) and deployed forces, which included two Bushmaster protected mobility vehicles configured as mobile headquarters (Commander on the Move) units. The two vehicles are the prototypes of an eventual 18 Bushmasters to be delivered under Currawong and utilise the Electronic Warfare variant being delivered under Project Land 500, but modified with battlefield communications equipment, including a roof-mounted satellite dish and the BDA-developed Currawong Network Access Module (NAM).

Other equipment being developed under Release 2 includes the installation of a 2.4-metre SATCOM antenna and system on the standard trailer now being acquired by the ADF under Project Land 121.

"There is a really strong focus on achieving the smallest possible footprint for the key communications elements of the program," Davis said. "The technology and the architecture can be fitted in the Bushmaster and handle anywhere between five and 25 users. It can also go into a vehicle enclosure and support a joint task force headquarters of 500-plus users."

The latest equipment has now been rolled out to several ADF communications units, including Army's 7 Combat Signal Regiment (7 CSR) and 1 Signal Regiment (1 SR) and the RAAF's 1 Combat Communications Squadron (1 CCS). Most recently it has been delivered to Army's 145 Signals Squadron and 136 Signals Squadron (TACINT) and Davis says the feedback to date from all users has been very positive.

"With the agile development methodology you progressively build customer

"There is a really strong focus on achieving the smallest possible footprint for the key communications elements of the program"



The latest equipment has now been rolled out to several ADF communications units.

NIGEL PITTAWAY

'buy-in' and the units are very capable and comfortable with the product now, because they have had a lot of engagement," he said. "Comments from Defence are that it's one of the best they've ever seen, because of that high end-user engagement. The feedback is that what has been achieved is exceptional."

Internet of Things firmly on ADF's horizon

Ewen Levick | Sydney

Defence is stepping up investments in the 'Internet of Things' as Australian technology looks set to integrate the concept into military operations.

Last month, *ADM* reported that Adelaide-based SME Myriota [secured funding](#) from Boeing venture firm HorizonX to develop its direct-to-satellite technology. The shoebox-sized nanosatellites and corresponding ground links have the potential to revolutionise the 'Internet of Things', or the potential for any device to share data with each other, and end users, regardless of location.

ADM caught up with Myriota's CEO David Haley and Defence Science and Technology's (DST) Dr Christine Shanahan and Leong Yen to see how the next internet revolution is set to impact the ADF.

"The Internet of Things obviously by its very nature has already changed the future battlefield," Dr Shanahan said. "That's due to the ubiquity of sensors, the ability to collect vast amounts of information and to share that information. That's obviously available to both enemy combatants and non-combatants as well.

"For the ADF, that is creating a very dynamic operational environment which increases the complexity of the space in which any one individual needs to operate."

DST and Myriota are working together to find ways of heightening commanders' awareness of the urban environment.

"If you just look at the numbers, a larger percentage of the human population is in cities or in urban environments, so we expect that to be very important in the future," Shanahan said.



The Internet of Things will provide soldiers with information on the increasingly contested urban battlefield.

DEFENCE

"Within those urban environments we have to be able to sense what we want to sense, and know what we need to know, before we conduct an operation and during an operation, and we need to be able to move that data around.

"It's about having a lot of small, distributable, and unattended sensors that we can place out across the battlefield."

Myriota's direct-to-satellite technology will enable DST to do just that. "It's the long battery life and small size of our solution, and its ability to communicate directly with a satellite even under those constraints, that make it very attractive for those kinds of applications," CEO David Haley said.

"As we have more satellites, we have a decrease in latency, we have another means of moving information around on the battlefield," Shanahan said.

DST is also interested in the application of this technology in military logistics, somewhat similar to what is seen in commercial operations.

"Within the next few years we're hoping to look at some simple changes in the logistics supply chain, and demonstrate the technology to see how it fares," Yen said. "We developed a proof-of-concept with Myriota around what's called a 'Smart Storage Box'."

The Box could enable logisticians to monitor and track the condition, quantities and movements of supplies in a more timely manner, thereby improving the efficiency and effectiveness of the supply chain.

IoT technology can also monitor the health of soldiers in real-time using a device known as a 'Fight Recorder', currently in joint development by Myriota and DST.

From there, DST expects that the Internet of Things will gradually permeate all aspects of military operations.

"We expect that going into the future, the Internet of Things will just become more intelligent and more pervasive," Shanahan said. "It could creep in just about anywhere."

Whilst IoT is still in the early stages, developing the full spectrum of possible applications will involve a wide range of domestic industry players.

"My focus right now is all about moving of the information around but there's a point at which I will be integrating different sensors," Shanahan said. "Those sensors are going to come from other companies. There are certain sensors that we'd be interested in."

The ultimate benefit, however, will be felt by serving members of the ADF.

"They've already got such complex battle spaces they operate in, they really have so much information in their minds, they have to be able to react so quickly," Shanahan said.

"IoT could definitely reduce significant burdens on our serving men and women by taking a bunch of processes out that we just don't need a human to be wasting any of their brainpower on."

The next step is to test the technology with other Five-Eyes nations in Contested Urban Environment (CUE) 2018, to be held in Canada this September.

"It's about having a lot of small, distributable, and unattended sensors that we can place out across the battlefield"

Titomic unveils world's largest 3D metal printer

Nigel Pittaway | Melbourne

Following its announcement on May 14 that it had [partnered](#) with Fincantieri Australia, the Melbourne-based metal additive manufacturing company Titomic has unveiled the world's largest 3D metal printer.

"We're up to 45 kg per hour and nothing else comes close to that"

In a ceremony on May 16, the company formally commissioned the 9m x 3m x 1.5m machine, which it says is capable of manufacturing large and complex parts in just minutes. Previously, 3D metal printers have largely only been capable of a material build of just one kilogram in a 24 hour period, whereas Titomic's machine can manufacture parts of up to 45 kg in one hour.

"Where we differentiate is the speed, we're up to 45 kg per hour and nothing else comes close to that," Titomic CEO and CTO Jeff Lang said. In terms of size, Lang says that the largest 3D metal printing up until now has been around one cubic metre, where his company is now capable of achieving up to 40 cubic metres, or 40 times the size. "It's an exponential increase in scale and speed and because our process uses cold spray technology, we don't melt the metal and can fuse dissimilar metals together," he said.

The machine was manufactured in Melbourne by Advanced Robotics Australia and both it and the now-patented manufacturing process have been developed in partnership with CSIRO. It has its origins in the use of cold spray technology, together with large quantities of titanium powder, to rapidly manufacture large and complex parts.

Cold spray technology has been around for some time, albeit as a means of coating materials using the supersonic deposition of metals, but combining it with the additive manufacturing process has produced what Lang calls a 'game-changer' for engineering and industrial design.



Titomic's team at the launch of the world's largest metal 3D printer.

SANJEEV SINGH



Jeff Lang and Sean Costello at the launch.

SANJEEV SINGH

According to Lang, Defence and aerospace applications include ballistics coatings, or the manufacture of structures capable of withstanding hypersonic speeds, as well as the next generation of space applications.

"We're dealing with all the major defence primes around the globe, ranging from missile components and armaments all the way through to land vehicles and naval vessels, and we're working on the space applications – satellites and space travel – as well," he said.

"We're also developing the next generation of smart materials, what we call super alloys and hybrid materials. We're really at the foundation point of a whole new generation of composite metal fabrication."

Defence launches autonomous systems research centre

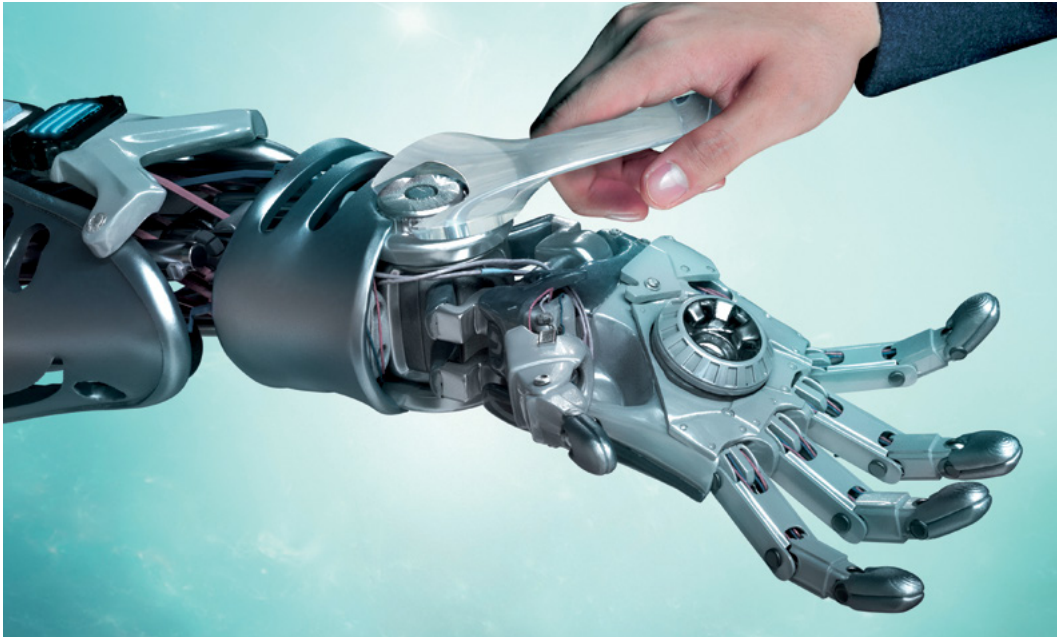
The first Defence Cooperative Research Centre (CRC) for Trusted Autonomous Systems has been launched in Brisbane at the International Conference on Robotics and Automation (ICRA) 2018.

Minister for Defence Industry Christopher Pyne welcomed the CRC, which was established under the Next Generation Technologies Fund.

"I am pleased the first Defence CRC, which is focused on trusted autonomous systems, has got off to a fitting start at the world-leading International Conference on Robotics and Automation," Minister Pyne said.

"The Defence CRC allows Australia's industry and research sectors to collaborate with Defence on leading edge technologies such as autonomous systems to maintain the ADF's capability advantage."

The Defence CRC has been established to research and deliver autonomous



The CRC aims to ensure trusted and effective cooperation between humans and machines.

GETTY

technologies to Defence, ensuring trusted and effective cooperation between humans and machines.

Inaugural founding company members of the Defence CRC include BAE Systems Australia, DefendTex, RMIT University, and Defence Science and Technology.

The Defence CRC will initially carry out three research projects in the maritime, air and land domains led respectively by Thales Australia, Lockheed Martin and BAE Systems.

“The Defence CRC has been established to research and deliver autonomous technologies to Defence”

Minister Pyne said the CRC program is a tried and tested model with a proven track record in translating research into capability.

“Not only will Defence benefit with new capabilities, Australian industry will improve its expertise and competitiveness in autonomous technologies,” Minister Pyne said.

“I look forward to the CRC making a vital contribution to advances in autonomous systems for Defence capability.”

To be headquartered in Brisbane, the Defence CRC for Trusted Autonomous Systems will be chaired by Jim McDowell, Chancellor of the University of South Australia.

This year’s ICRA, a flagship event for worldwide robotics researchers, is convened by Chief Defence Scientist Dr Alex Zelinsky.

MOST READ ONLINE AT WWW.AUSTRALIANDEFENCE.COM.AU



1. [The Future Frigate decision: ASPI](#)
2. [Brent Clark: The long, stealthy voyage has begun](#)
3. [Third and final Air Warfare Destroyer launched](#)
4. [ADM announces Women in Defence Award finalists](#)
5. [New leadership at Naval Group Australia](#)

Rolls-Royce turbine for Japanese frigates

Rolls-Royce has been selected to supply its MT30 gas turbine to power a new class of frigates for the Japan Maritime Self Defense Force (JMSDF).

The MT30 is on offer to the RAN as part of BAE System's bid for [Sea 5000](#).

The selection means Japan is the fifth nation to select the MT30 for a major naval ship building program.

“Japan’s selection of the MT30 means that the three largest users of marine gas turbines have all endorsed the capabilities of the MT30”

“Japan’s selection of the MT30 is very significant and means that the three largest users of marine gas turbines have all endorsed the capabilities of the MT30 and selected it to power significant future programs,” Sam Cameron, SVP Defence Rolls-Royce, said.

“The MT30 is the world’s most power dense marine gas turbine in service today, a key feature for naval ships where high power in minimum space, whilst meeting the operational power demands of the future, is essential.

“The increased demand for power by the world’s navies is a clear trend and for Japan we will deliver a power rating in excess of 40 megawatts, the highest so far for this gas turbine

unrestricted by global climate conditions.

“The power and performance of this modern gas turbine is providing shipbuilders and system designers with new options, choices and the ability to futureproof their latest naval platforms, combined with the additional benefits of through-life power retention with ultra-low on-board maintenance requirements.

“We have a long and successful history of powering Japan’s naval fleet which stretches back almost 50 years, and our strategic relationship with local partner Kawasaki Heavy Industries has seen us provide more than 200 gas turbines. We



The MT30 is on offer to the RAN as part of BAE's Type 26 GCS.

BAE SYSTEMS

look forward to the next chapter in this successful relationship with 30FFM.”

Construction of the first of the 30FFM class frigates will begin next year, with entry into service expected around 2022.

In addition to the Japanese frigates, the MT30 powers the Royal Navy's new aircraft carrier HMS *Queen Elizabeth*, the US Navy's Freedom Class variant of the Littoral Combat Ship and DDG-1000 destroyers, South Korea's FFXII frigate, and Italy's forthcoming Landing Helicopter Dock ships.

Rolls-Royce [recently partnered](#) with Australian firm Marand for the MT30 gas turbine enclosure manufacture and integration, should BAE Systems' Global Combat Ship be chosen as RAN's Future Frigate.

Rolls-Royce is providing a range of products to the Type 26, including the MT30 gas turbine, MTU diesel generators, mission bay handling system, propellers, steering gear and stabilisers, and refuelling at sea equipment.

Australia shows interest in UK Galileo replacement

Reports have emerged suggesting that the British government may seek Australian assistance in building its own satellite navigation system, following the news that Britain may not have full access to the European Galileo system after Brexit.

British firms will also be barred from tendering for Galileo, the European equivalent of GPS. A number of UK firms are already involved in the build, including Airbus UK, CGI UK, and Surrey Satellite Technologies.

In response, the British government has threatened to prevent UK firms from transferring technical knowledge on Galileo's Public Regulated Service (PRS), a navigation and timing signal used by militaries and government agencies, to Brussels.

The Galileo project aims to provide European governments with a secure alternative to GPS in order to reduce military reliance on the US.



A GPS Block IIR(M) satellite. The US has previously withheld access to the system.

GPS.GOV

The US has previously denied India access to the GPS system, which has also experienced outages due to technical issues. India built its own system following the US denial.

Reports in the Financial Times have indicated that the Australian government expressed interest in participating in the British project, although Canberra did not provide further comment.

The news follows the launch of a national space agency in Australia, which forms part of the government's plan to boost the domestic space sector. [Budget 2018](#) committed \$41.8 million over the next four years towards this objective, including \$26 million for the space agency.

“The Australian government has reportedly expressed interest in participating in the British project”

PEOPLE ON THE MOVE

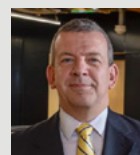
CSRC

The Australian Cyber Security Research Centre (CSRC) has announced the appointment of new CEO, Rachael Falk. Rachael comes to CSRC with a strong commercial and cyber security background, having practiced as a lawyer for 15 years both in law firms but also in-house at Telstra. She is also the co-author of the Five Knows of Cyber Security. “We are delighted to have Rachael as our Chief Executive,” CSRC Chair David Irvine said. “Not only does she bring a wealth of industry knowledge, she will ensure that CSRC collaborates with academia, industry and government to deliver industry-driven cyber security outcomes.”



Naval Group Australia

John Davis has been appointed as the new CEO and Future Submarine program director for Naval Group Australia, effective 1 July 2018. Davis will lead Naval Group through the ongoing delivery of the Future Submarine program. He takes over from Brent Clark, who has served as interim CEO. Clark will become special advisor to the chairman. Jean-Michel Billig will serve as interim CEO until 1 July.



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Forthcoming Events

ADM EVENTS

More detail on **ADM** Events can be found on our dedicated website: admevents.com.au

- [ADM Women in Defence Awards](#) – 27 July 2018
- [ADM STEM in Defence Summit](#) – 21 August 2018
- [ADM Defence Estate & Base Services Summit](#) – 19 September 2018
- [ADM Defence in Northern Australia Summit](#) – 10-11 October 2018

ASDEFCON TD/IP Roadshow

Location Sydney, Melbourne, Newcastle, Cairns, Brisbane, Adelaide, Perth, Darwin

Date 2 May – 5 July 2018

Register procurement.ASDEFCON@defence.gov.au

Following the official launch of the new ASDEFCON Technical Data/ Intellectual Property (TD/IP) framework on 11 April, roadshows have been scheduled around the country from May to July 2018. The roadshow is open for both Defence and industry personnel to attend. Each roadshow will comprise a general overview of the new framework and interactive sessions.

Defence Industrial Capability Plan Brief

Date 25 May 2018

Location Kedron Wavell Services Club, 21 Kittyhawk Drive, Chermside QLD

Website <https://www.eventbrite.com.au/edit?eid=45886202868>

At the invitation of AIDN QLD, Assistant Secretary Defence Industry, Matt Ramage from the Defence Industry Policy Division, and his team, will be in Brisbane on 25 May 2018 to brief on the Defence Industrial Capability Plan. The Plan, launched by Defence Industries Minister Pyne on 23 April 2018, outlines the Government's vision to build a robust, resilient and internationally competitive Australian industry base that is positioned to help meet Australia's defence capability needs.

Association of Old Crows conference 2018

Date 28-30 May 2018

Location Adelaide

Website [AOM events](#)

The Australian Chapter of the Association of Old Crows will hold its biennial Electronic Warfare (EW), Electromagnetic Spectrum Management Operations, Cyber Electromagnetic Activities (CEMA), Information Operations (IO) Convention focusing on the "*Interoperability and Collaboration in the Indo-Pacific Region*", seeking to investigate both organisational and technical interoperability and collaboration across EW, CEMA and IO battlespace.

ADSTC Synthetic Environment Working Group

Date 5 June 2018

Location Bradman Room, Manuka Oval, Canberra

Website ADSTC.simsupportpanel@defence.gov.au

The next Department of Defence, Australian Defence Simulation and Training Centre (ADSTC) Synthetic Environment Working Group (SEWG) will be held on 5 June 2018 in the Bradman Room, Manuka Oval, Canberra. The SEWG is aimed to be flexible for the needs and professional development of all members. The SEWG Agenda is still under construction, but is expected to include: SEWG Co-Chairs' updates; Speed Marketing from Industry; Short Defence updates; Modelling and Simulation (M&S) Capability Innovation Scenarios; and Innovation and Emerging Technology Interactive Sessions.

Defence Synthetic Environment Working Group

Date 5 June 2018

Location Canberra

Website ADSTC.simsupportpanel@defence.gov.au

SEWG is an interactive working group exploring innovative uses of modelling and simulation (M&S) and investigate the future for emerging M&S technologies. The group represents an opportunity to explore how to integrate the M&S industry as part of the ninth fundamental input to capability. At this year's SEWG the group are keen to provide more opportunity for industry members to present. They have included as part of the agenda an item titled 'Speed Marketing'. Approximately an hour will be broken into between five and 10 minute segments where industry members can provide an update on their company, new innovations, their future direction, or any other topic which they feel would be of benefit to other SEWG members.

PASA MRO for Procurement Conference

Date 5-6 June 2018

Location Stamford Plaza, Brisbane

Website <https://procurementandsupply.com/events/pasa-mro/>

This two-day special event will give your organisation the insight to gain greater control of your MRO and spare parts inventory spend, address your key issues with MRO and spare parts inventory management and unlock the significant hidden costs-savings associated with MRO procurement. The conference examines issues such as who should own and control MRO and spare parts, why most companies underestimate its importance, and how to develop a good MRO strategy that can improve your bottom line.

Building Australia's Strategy for Space: ASPI

Date 13-15 June 2018

Location QT Hotel Canberra

Website www.ivvy.com.au

The conference will bring together distinguished international and Australian experts for two days of debate on Australia's long-term strategic plan to grow its burgeoning space industry.

IFRS Next

Location Canberra

Date 28 June 2018

Register <https://www.regionalsecurity.org.au/event-2861870>

Future strategic leaders will deliver six-minute presentations about a topic they're passionate about and they also feel is of importance to Australia's national security. Expect innovative thinking and insights, even some controversy. It runs for one hour in the arthouse-style setting of Palace Electric Theatre, and is followed by a networking event. It is your chance to engage in conversation with Australia's future security leaders.

Defence + Industry Conference and Gala Awards 2018

Date 1 August 2018

Location Canberra

Website CASG

The annual CASG and Defence Industry gathering in Canberra to discuss policy and programs with a range of speakers gathering to discuss the way forward. A Gala Awards night will take place on the evening preceding the event, where ADM's Essington Lewis Awards will be presented, recognising excellence in collaboration.

Project and program management symposium

Date 14-15 August

Location UNSW @ ADFA, Canberra

Register www.pgcsymposium.org.au

The annual Project and Program Management Symposium provides a forum that brings together project management people to share knowledge and improve the governance and controls skill sets available to deliver successful project outcomes for the nation. A highlight of the symposium is its access to thought leaders from the USA and Europe. Each year, selected speakers from overseas are brought to the symposium to share knowledge and provide an international perspective on project and portfolio management.

Hunter Valley Defence Conference 2018

Date 30-31 August 2018

Location Crowne Plaza Hunter Valley

Website HunterNet

The 2018 Defence Conference will focus on driving collaboration and engagement between Defence Primes, the region's SME's, academia and Defence. A highlight of the conference will be the spectacular low flying aerial show from Matt Hall Racing, followed by a gala dinner.

Land Forces 2018

Date 4-6 September 2018

Location Adelaide

Website www.landforces.com.au

Presented in collaboration with the Australian Army, LAND FORCES 2018 is an international industry exposition to showcase equipment, technology and services for the armies of Australia and the Indo-Asia-Pacific.

SIA Biennial Conference

Date 7-8 November 2018

Location Canberra Rex Hotel

Website www.submarineinstitute.com/sia-conferences

Join submarine professionals and key decision makers as the ninth in the Biennial series of conferences run by the Submarine Institute of Australia returns to Canberra to explore the issues and opportunities emerging from the decision to extend the lives of the Collins class submarines.

MilCIS 2018

Date 13-15 November 2018

Location Canberra

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.

TEAM DEFENCE AUSTRALIA EVENTS

- **Eurosatory 2018** – 11-15 June 2018, Paris, France
- **Euronaval 2018** – 23-26 October 2018, Paris, France
- **AUSA 2018** – 8-10 October 2018, Washington DC, US
- **Indo Defence 2018** – 7-10 November 2018, Jakarta, Indonesia

For more information go the business.gov.au TDA webpage [here](#). TDA EOIs will open a few months prior to the event – to keep up to date [register](#) for the CDIC newsletter.