

ADM

AUSTRALIAN DEFENCE MAGAZINE

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DEFENCE WEEK PREMIUM EDITION



Beth is the latest in Ocius' fleet of Bluebottle USVs.

EWEN LEVICK

OCIUS LAUNCHES LATEST USV

Sydney-based SME Ocius Technology has officially christened the latest addition to their fleet of Bluebottle unmanned surface vessels (USVs).

EWEN LEVICK | SYDNEY

The new USV, named *Beth*, is longer and larger than previous iterations *Bob* and *Bruce*. It will carry Thales Australia towed arrays, a larger winch, and Solar Composite Structures crafted by SA-based Praxis Aeronautics, a start-up headed by siblings Cameron and Katie Donaldson.

"Politically and economically, the oceans are still like the Wild West," Ocius founder Rob Dane said to a small group of attendees. "And Australia's responsible for 11 per cent of it. Monitoring is expensive, we don't get 100 per cent coverage, it puts people in harm's way and the coronavirus now makes it that much harder. That's why we're here."

The company has a contract through the Defence Innovation Hub to build five of the next generation

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Bluebottle USVs, of which *Beth* is the first. Over the next two years, these will be deployed off the coast of WA and the NT to conduct various taskings.

The Bluebottles have significant potential in a variety of different roles. A number could act together as a wide-area sonar array to listen for submarines, or a single Bluebottle could act as a 'gateway node' between platforms in the air and under the surface, such as future unmanned underwater vessels (UUVs) or an undersea surveillance system. The company is currently exploring this latter possibility in a program with DST Group.

**"OCIUS HAS LIVED MOORE'S LAW;
THINGS GET BETTER AND HALF
THE COST EVERY TWO YEARS"**

Civilian applications also abound, such as marine and weather monitoring in hard-to-reach areas, GPS mapping or hydrocarbon monitoring. Charles Darwin University is involved with Ocius in a climate and oceanography project.

One of the Bluebottle's unique selling points, Dane explained, is also one of its simplest. The trailer, designed by chairman Mark Bethwaite, who christened the new boat, allows two people with a car

to launch a Bluebottle from any boat ramp in Australia.

"Our better funded competitors in America can't do that," Dane said. "They need a boat or a massive crane."

Ocius first used an off-the-shelf solar panel mounted on the deck to power the Bluebottles, but the partnership with Praxis Aeronautics, which came about through a chance meeting at the Avalon Airshow in 2019, has proven revolutionary.

"We first built Ocius a foredeck for *Bruce*," Katie Donaldson said to ADM. "We're now contracted to build for *Beth*."

"The power management that we supplied was first developed through our work on UAVs," Cameron Donaldson added. "We will be using several of those in the new build."

"The silicon cells that we use are far more efficient than what people generally encounter with domestic or commercial solar. Our manufacturer puts aside the best-performing batches for mobile power applications like ours."

Solar cells are now encapsulated directly into the deck and sail composites using a unique proprietary process.

"We've more than doubled the number of cells on their foredeck, just because we can design the array into any shape," Cameron said. "There was also an increase in the performance of the cells."

"What we've found is that we've more than doubled the amount of energy they're collecting from the foredeck. There's also a drastic increase in the number of cells of the aft-deck and the sail."



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IMAGE COURTESY OF GA-ASI.



L3HARRIS

For Ocius, Praxis designed the Solar Composite Structures for durability. The vessels are able to remain at sea virtually indefinitely, limited only by the build-up of marine life on the hull.

“One of the challenges we face is that each of the applications we are designing for is at the cutting edge therefore each solution required from us is custom,” Katie said. “The requirements of each customer are unique therefore we customise each solution to what they need, balancing the elements of strength, weight, and power.”

“People often ask what the future holds,” Dane said. “Ocius has lived Moore’s law for the last 20 years; things get better and half the cost every two years. So where will we be in two years? I’d say we’ll be twice as good as we are now. And I know my engineers will laugh at that as its probably an overestimation.

“But ask me where we’ll be in 10 or 15 years, when the future frigates and subs come along, and I think I’d underestimate that, [because] Moore’s law is subject to the miracle of compound interest.”

NEW FUNDS FOR AUTONOMOUS MINE COUNTERMEASURE TECH

New autonomous technologies will revolutionise mine clearance capability in operations close to shore through a new five-year, \$15 million research and development project.

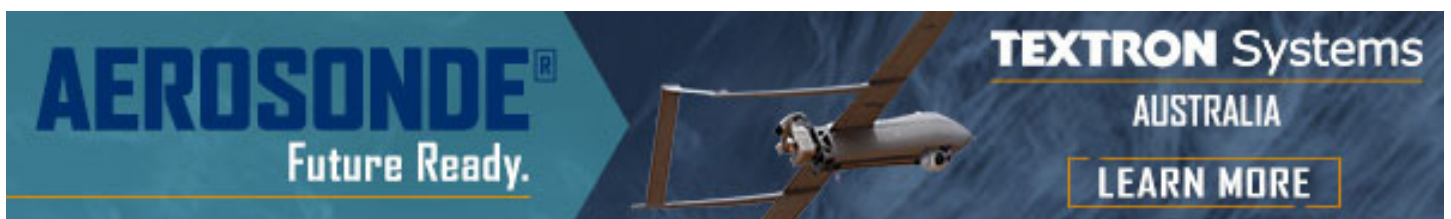
The project is part of a new partnership between Defence, Australia’s Trusted Autonomous Systems Defence Cooperative Research Centre (TAS DCRC) and Thales Australia.

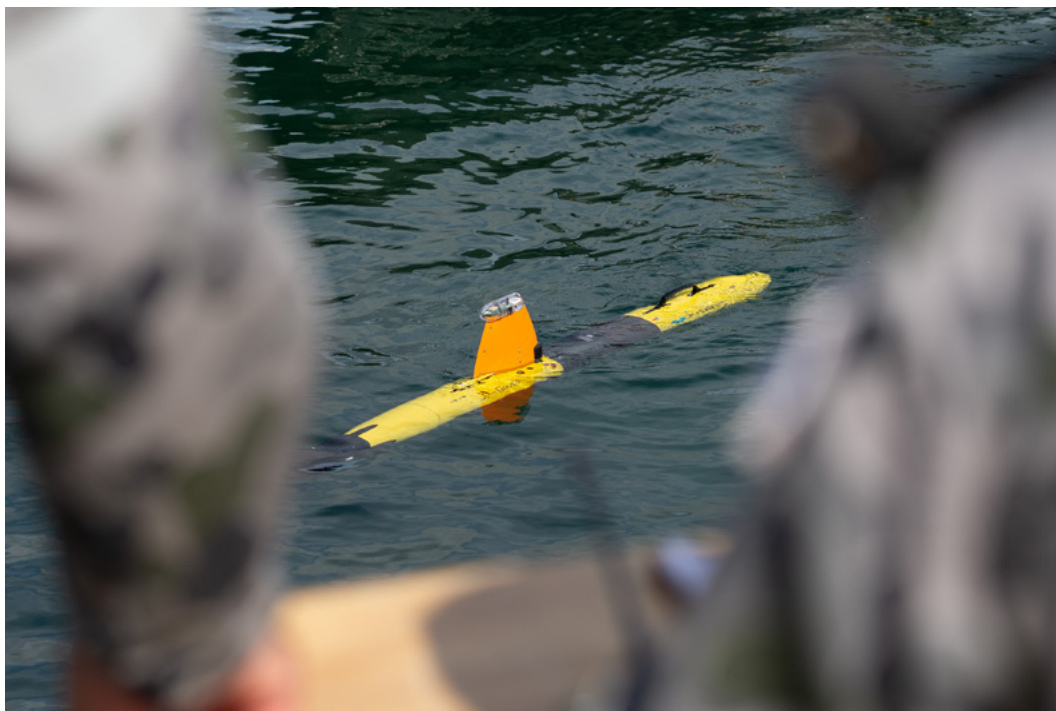
Researchers will design, develop, test and evaluate various teams of micro Autonomous Underwater Vehicle swarms and Autonomous Surface Vessels, to develop new systems for underwater mine detection and clearance.

Minister for Defence Senator Linda Reynolds said the project will harness Australian research and innovation capabilities in autonomous systems technologies.

“As announced in the 2020 Force Structure Plan, developing new systems for underwater mine detection and clearance are vital to protecting Australia’s maritime environment and advancing our interests,” Minister Reynolds said.

“Key technologies such as artificial intelligence, big data, connectivity and cyber security will be vital in developing the capability to autonomously undertake environmental





The Gavia Autonomous Underwater Vehicle is remotely piloted by Australian Mine Warfare Team 16 during an internal training period.
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**“THE PROJECT WILL HARNESS
AUSTRALIAN RESEARCH AND
INNOVATION CAPABILITIES
IN AUTONOMOUS SYSTEMS
TECHNOLOGIES”**

data collection and mine countermeasures missions.

“This will help to create a safer operating environment for ADF personnel.”

Minister for Defence Industry Melissa Price said Australian businesses will play a vital role in the TAS DCRC project.

“Our local business partners will be part of the team designing and developing a communication, simulation and training solution for the new autonomous technologies,” Minister Price said.

“We are delighted to be working with the TAS DCRC, Thales, and Australian businesses Mission Systems and INENI Realtime.

“This will help us accelerate the development and deployment of autonomous systems and solutions in the area of mine counter measures.”

Research partners include Flinders University, the University of Sydney, the University of Technology Sydney and Western Sydney University who will design, develop, test and evaluate various platforms.





Inspector General Eberhard Zorn of the German Armed Forces views an Australian Shadow 200.

DEFENCE

INSITU PACIFIC AND NOVA SYSTEMS TEAM FOR LAND 129

Insitu Pacific signed a teaming agreement with Nova Systems as part of its Australian-industry-led proposal to supply tactical Unmanned Aerial Systems (UAS) to the Australian Army under Land 129 Phase 3.

“Insitu Pacific’s experienced Australian team and our AS9100D certification underpin the delivery of a fully compliant and documented system,” Andrew Duggan, Managing Director, Insitu Pacific, said. “Our solution is further strengthened by Nova Systems as acknowledged Australian experts in working through all the engineering and testing steps necessary to deliver complex UAS to the ADF.

“They will bring this extensive experience and expertise to bear as part of Insitu Pacific’s Land 129 solution for Army.”

“Nova Systems brings the right mix of engineering and next-gen technical skills to the Insitu Pacific Land 129 Team,” Peter Tippner, General Manager Aerospace and Surveillance, Nova Systems, said. “Our team of expert engineers has an in-depth understanding of the customer’s requirements, based on their experience with Shadow 200, and ADF UAS capabilities since 2008.



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“Our proven ability to integrate complex systems into the ADF within acquisition projects such as Air 7000 Phase 1B Triton and Air 7003 Armed UAS capability, ensures that full operational capability can be achieved rapidly, with minimal risk.”

“OUR TEAM OF EXPERT ENGINEERS HAS AN IN-DEPTH UNDERSTANDING OF THE CUSTOMER’S REQUIREMENTS”

Army’s goals for capability procurement under Land 129 include requirements to ensure that the UAS delivered are flexibly able to operate in commercial airspace in Australia or overseas on deployment. This drives a focus on providing proven systems with extensive testing data and technical detail to enable the work necessary with Defence and Civil regulators to support these type of operations.

“The suppliers and partners we’ve assembled set the foundation for long-term Australian industry capability growth. Insitu Pacific is the local, established and low-risk tactical UAS partner for the Commonwealth, and we’re ready to deliver, grow and sustain the next generation of Army Tactical Unmanned Aerial Systems,” Duggan said.

RESEARCH GRANTS ANNOUNCED FOR WA

WA’s Defence industry will be boosted with research grants worth almost \$900,000 from the federal and WA governments.

Minister for Defence Industry Melissa Price and WA State Defence Issues Minister Paul Papalia have announced six grants in the second round of the WA Defence Science Centre’s (DSC) Collaborative Research Grants.

DSC is one of five state-based organisations established by Defence and the states to promote participation of the academic sector and industry in Defence-related research.

It receives funding from the Australian Government’s Next Generation Technologies Fund and from the WA Government.

Minister Papalia said investing in the six projects through the Defence Science Centre would help raise WA’s profile in cutting-edge defence research and build capacity in its local defence industry.

The grants are each valued at up to \$150,000 and total \$883,000.

All four WA DSC member universities are involved in each of the research projects, with local WA businesses involved in three.

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Minister for Defence Industry Melissa Price during a recent visit to HMAS Stirling

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The successful research projects are:

- Automatic searching and tracking of abnormal ground signals from a satellite constellation – led by Curtin University in collaboration with Edith Cowan University, Latconnect60 and the Defence Science and Technology Group; \$142,920.
- Virtual reality-enhanced advanced tactical parachute training – led by Edith Cowan University in collaboration with Curtin and Murdoch universities, Adventure Out Australia and the Department of Defence; \$148,145.
- Categorising lower body injury risk in female and male recruits through muscle-bone imaging – led by Edith Cowan University in collaboration with the University of WA, Deakin University, the WA Police Force, the US Army, University of Jyväskylä Finland and University of Notre Dame Australia; \$150,000.
- A deployable space domain awareness sensor system – led by Curtin University in collaboration with the University of WA and local company Geng; \$148,640.
- Visual positional system to localise targets on a 3D map using a single drone image – led by the University of WA in collaboration with the Defence Science and Technology Group and Remsense; \$144,166.
- Investigation into the health and performance impacts of the Australian Special Forces selection course – led by Edith Cowan University in collaboration with the Department of Defence, University of Pittsburgh USA and CSIRO; \$150,000.

**“THE GRANTS AIM TO
FURTHER IMPROVE WA’S
DEFENCE INDUSTRY”**



**SCEC APPROVED
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MASTER KEY SYSTEM**





Modern firefighters are exposed to a cocktail of toxic chemicals in many fire situations.

DEFENCE

PFAS RISKS FOR FIREFIGHTERS EXAMINED

A parliamentary inquiry into PFAS remediation in and around Defence bases has heard about the legacy risks of PFAS-based firefighting foams to firefighters at these and other sites.

Modern firefighters are exposed to a cocktail of toxic chemicals in many fire situations, and the United Firefighters Union of Australia says that the continued use of PFAS-based firefighting foams and PFAS contaminated water for firefighting is exacerbating those risks.

Chair of the PFAS Sub-committee of the Joint Standing Committee on Foreign Affairs, Defence and Trade Dr John McVeigh said that the UFUA discussed its work to reduce these risks nationally and its international advocacy for the elimination of fluorine-based firefighting foams under the Stockholm Convention on Persistent Organic Pollutants.

“WE’VE BEEN TOLD THAT SOME COMMUNITIES OUTSIDE DEFENCE BASE REMEDIATION AREAS ARE NOT GETTING THE SUPPORT THEY NEED”

In its submission, the UFUA has indicated that the legacy impacts of PFAS on firefighters and communities near fire training grounds are the same as those for Defence personnel and communities living in and nearby Defence bases.

“In the inquiry, we’ve been told that some communities outside Defence base remediation areas are not getting the support they need to identify and deal with PFAS contamination issues,” Dr McVeigh said. “The Sub-committee wants to learn about the UFUA’s efforts with other unions, fire service employers, environmental and medical scientists, and with Government agencies to

achieve practical results for firefighters and PFAS affected communities in Australia and overseas.”

The PFAS Sub-committee's program of review continues with evidence from the Macquarie University PFAS Clinical Study, which is based on blood samples from career firefighters provided by the Metropolitan Fire Brigade with assistance from the UFUA.

SUBMARINE CONFERENCE SET TO PROCEED

The leading forum in the Indo-Pacific for information-sharing and debate on submarines and submarine matters – the Submarine Institute of Australia (SIA) conference – is set to go ahead in November this year.

However, social distancing and other restrictions because of the coronavirus pandemic mean the 10th Biennial SIA Conference will be distinctly different to the corresponding events in past years.

**“A MAXIMUM OF 100 PEOPLE
(IN TOTAL) WILL BE PERMITTED
TO ATTEND THE EVENT”**

“Understandably, there has been a lot of uncertainty because of the coronavirus pandemic, but the SIA has moved to clear this up,” SIA Executive Director, David Nicholls said. “The SIA is pleased to announce that the 10th Biennial SIA Conference is set to take place as scheduled, on 16-18 November at the Hotel Realm in Canberra.

“Naturally, the SIA will continue to monitor the public health environment for significant changes, but the conference is set to proceed, unless another major health threat emerges.”



The 10th Biennial Submarine Institute of Australia Conference is set to take place as scheduled.

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The major change in 2020 is that this year's conference will have a hybrid in-person/online format.

This means a maximum of 100 people (in total) will be permitted to attend the event (to comply with current ACT Government social distancing restrictions) and everyone else who wishes to attend, but are unable to will be able to watch all conference presentations online via a webinar format.

Despite the interrupted nature of planning for the conference, the program has brought together the following high-calibre speakers:

- Richard Marles – Shadow Minister for Defence
- Professor Don Winter – Chair, Naval Shipbuilding Advisory Board
- Vice Admiral Michael Noonan – Chief of Navy
- Gregory Sammut – General Manager, Submarines, CASG
- Rear Admiral David Goggins – Program Executive Officer for Submarines, US Navy
- Professor Tanya Monro – Chief Defence Scientist (Australia)
- Peter Jennings – Executive Director, Australian Strategic Policy Institute
- Innes Willox – Chief Executive, Australian Industry Group.

Further information about the program of speakers can be found on the SIA website.

MOST READ ONLINE AT WWW.AUSTRALIANDEFENCE.COM.AU



1. [Singapore extends Oakey Chinook footprint](#)
2. [Loyal Wingman breaks cover](#)
3. [Submarines and manned-unmanned teaming](#)
4. [Next-gen tactical watercraft launched in Hobart](#)
5. [Australia signs EW agreement with US](#)

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FORTHCOMING EVENTS

ADM EVENTS

More detail on ADM Events can be found on our [dedicated website](#).

- [ADM Women in Defence Awards](#) – 23 October 2020 | Online
- [Northern Australia Defence Summit](#) – 28 October 2020 | Online
- [ADM Space Summit](#) – 2 December 2020, Hyatt Hotel | Canberra
- [ADM Congress](#) – 3 February 2021, Hyatt Hotel | Canberra
- [ADM Defence Estate](#) – 23 February 2021, Hotel Realm | Canberra

6TH INTERNATIONAL HLS & CYBER CONFERENCE & EXHIBITION

DATE 14-15 September 2020
LOCATION Online
WEBSITE hls-cyber.b2b-wizard.com/expo

The HLS&CYBER event, the international homeland security and cyber event in Israel, returns for the sixth time, and this time, in a virtual format. The event, which will be held on September 14-15, 2020, will include a professional conference, as well as a virtual exhibition of about 100 Israeli companies in the field of homeland and cyber security and an online B2B conference arena.

AUSCERT 2020

DATE: 15-18 September
LOCATION: The Star, Gold Coast
WEBSITE: auscert.org.au/giveaway

The AusCERT Conference is the oldest information security conference in Australia. Each year, we attract in the vicinity of 800 participants and approximately 50 sponsors. AusCERT is hosting more than 50 speakers at AusCERT2020, as well as an array of tutorials, workshops, networking events & much more.

2020 ANI GOLDRICK SEMINAR – REMOTE AND AUTONOMOUS SYSTEMS AT SEA

DATE 13 and 14 October 2020
LOCATION Adams Auditorium, Australian Defence Force Academy
WEBSITE navalinstitute.com.au/latest-ani-events-and-archive

The 2020 ANI Goldrick Seminar will discuss a wide range of issues around Remote and Autonomous Systems at Sea. It will comprise six sessions over 1.5 days covering an overview of Remote and Autonomous Systems at Sea (RAS); RAS in the Littoral Domain; RAS in the Maritime Air Domain; RAS in the Undersea Domain; Measuring Effective, and Legal and Ethical Considerations.

4TH ANNUAL SYSTEMS MODELLING CONFERENCE 2020

DATE 27 October 2020
LOCATION Online
WEBSITE unsw.adfa.edu.au/conferences/SMC-2020

The Capability Systems Centre runs one-day conference on the use of whole-systems approach to design and manage complex problem in socio-technical and socio-ecological systems. The daylong virtual conference on October 27th will feature showcases on the use of systems thinking and systems modelling in a wide range of areas. The event provides a platform for researchers and practitioners to communicate about scientific and practical aspects of real-world problems, receive feedback, and share learning lessons.

10TH BIENNIAL SIA CONFERENCE 2020

DATE: 17-18 November 2020
LOCATION Hotel Realm, Canberra and online
WEBSITE submarineinstitute.com/sia-conferences

The 10th Biennial SIA Conference will be held 17-18 November 2020 at the Hotel Realm, Canberra. This year's theme is 'Submarine Build and Sustainment Programs: The Strategic Nature of Reliable, Sovereign Supply Chains'. The Call for Presentations is available on the website.

2021**43RD COSPAR SCIENTIFIC ASSEMBLY**

DATE 28 Jan-4 Feb 2021
LOCATION International Convention Centre Sydney
WEBSITE cospar2020.org

The Australian space research community enthusiastically extends the invitation to you, to meet with us for COSPAR 2020, and in so doing to forge the friendships and opportunities that will connect space research for global impact. The 2020 Assembly will combine the latest in space research findings with activities designed to enrich the global space research community – including helping equip our future leaders, and workshopping with space industry – and inspire the next generation of scientists and engineers.

LOCATE21

DATE 30 March – 1 April 2021 (rescheduled dates)
LOCATION Brisbane Convention and Exhibition Centre
WEBSITE locateconference.com/2021

Due to COVID-19, Locate20 has been rescheduled for Locate21 happening in Brisbane March 30 – 1 April 2021. The event will focus on how geospatial technologies are intersecting with business, Government and defence to address national challenges. It's Australia's premier spatial conference with the inclusion of over 50 inspiring thought-leaders including speakers from government, academia, the defence force, technology, mining, natural resources and more. We believe this conference is of interest to defence personnel.

LAND FORCES 2021

DATE June 1-3 2021
LOCATION Brisbane Convention Centre
WEBSITE 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.

ROTORTECH 2021

DATE 15-17 June 2021
LOCATION Royal International Convention Centre, Brisbane
WEBSITE rotortech.com.au

The new dates for Rotortech will be Tuesday 15 June to Thursday 17 June 2021. The venue, the Royal International Convention Centre in Brisbane, is unchanged. Rotortech is the region's premier helicopter and unmanned flight systems showcase and forum, featuring more than 100 participating companies and key speakers from industry and government. We believe that deferring Rotortech to its new June 2021 dates will achieve this goal by moving the event to a time where the COVID situation will have improved and the current uncertainties will have passed.

PROJECT AND PROGRAM MANAGEMENT SYMPOSIUM

DATE 10 – 12 August 2021 (rescheduled dates)
LOCATION Canberra Rex Hotel
WEBSITE pgcsymposium.org.au

Foresight is more valuable than hindsight! PGCS 2020 is designed to help project and program managers, and their sponsors and senior managers, develop the skills and understanding needed to deliver projects success in the next decade. Creating the organisational capability needed to underpin the consistent delivery of successful projects in the 2020's starts at the top. Now in its 8th year, PGCS 2020 will focus on ways to build the foundations needed to create project and program success

AVALON 2021

DATE 23-28 November 2021
LOCATION Avalon Airport

The Australian International Airshow and Aerospace & Defence Exposition is one of Asia-Pacific's most prestigious aviation and aerospace events and the most comprehensive aviation, aerospace and defence exposition in the southern hemisphere. Avalon hosts multiple concurrent conferences and expo streams, across the spectrum of Defence, Airlines, Business and General Aviation, Sport and Recreational Aviation, Airports, MRO, Space, Unmanned Systems, Air Safety and Ground Equipment.

2022

PACIFIC 2020 BECOMES INDO PACIFIC 2022

DATE May 2022
LOCATION Sydney Convention Centre
WEBSITE pacificexpo.com.au

Reflecting the increasing importance of the Indo Pacific region to the entire world, the PACIFIC International Maritime Exposition will become the INDO PACIFIC International Maritime Exposition from 2022. Initially, there will be a new timing. Instead of the previously planned PACIFIC dates in August 2021, INDO PACIFIC will now, in the wake of COVID 19, initially be held during May 2022.

VARIOUS DATES

NSW DEFENCE INNOVATION NETWORK'S REGIONAL ROAD SHOW**DATE:** Various**LOCATION:** Various**WEBSITE:** defenceinnovationnetwork.com/din-regional-road-show-2019-20

NSW Defence Innovation Network and AIDN will be undertaking a series of small business focused regional forums across NSW. Register to attend and hear about the programs, grants, opportunities and services the NSW Defence Innovation Network (DIN) provides to the small business community across NSW. We encourage small businesses to engage with us and participate in opportunities across our networks, including DIN's seven partner universities, as well as with other state and federal agencies.

ICCPM ONLINE WORKSHOPS**DATE** Various**LOCATION** Online**WEBSITE** iccpm.com/online-workshop-webinars

Designed to support project teams who are experiencing new challenges due to COVID-19 concerns – Learn how to mitigate new risk levels, effectively deploy virtual teams, manage messy problems and more. ICCPM Online Workshops and Webinars provide you with an easily accessible and engaging option to continue your training from anywhere in the world. These options provide you and your team with a conducive learning environment to support your complex project success.

ICCPM ROUNDTABLE WORKSHOPS**DATE** Various**LOCATION** Various**WEBSITE** iccpm.com/2020-rs

ICCPM, with Series Partner QUTeX, is pleased to confirm the upcoming Workshops for the 2020 International Roundtable Series Harnessing Emergence in Complex Projects: Risk, Uncertainty and Opportunity. The International Roundtable Series is an exciting Thought Leadership initiative where senior practitioners and leading academics come together and discuss the Series Theme to produce new insights and practical steps to improve complex project success. Registrations for in-person workshops are strictly limited to comply with COVID-19 venue safety guidelines. Please refer to each event page for more details.