

ADM AUSTRALIAN DEFENCE MAGAZINE DEFENCE WEEK PREMIUM EDITION

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A Seahawk helicopter conducts a forward passenger transfer with HMAS Rankin inside Cockburn Sound, WA.

DEFENCE

Submarines and the art of the understatement

Katherine Ziesing | Canberra

The submarine community has an uncanny knack for understatement, with the Submarine Institute of Australia conference last week demonstrating this in spades – which is perhaps reflective of the nature of people that work in this space. In any case, the event provided a valuable opportunity to focus on the submarine capability.

The conference theme was centred around the Collins class life of type extension (LOTE); current thinking and the technology to be delivered under Sea 1450 from both defence and industry perspectives. The interplay between the current capability and the new platform under the Future Submarine was never far away.

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Assistant Minister for Defence Senator David Fawcett set the scene, acknowledging the history of the Collins journey.

"Collins has been an outstanding success despite everything the program has gone through," Fawcett said, recognising the 'lived experience' of the audience.

"The scale and scope of what has been achieved with Collins is impressive."

All speakers reflected on the lessons learned from the Collins program and how they can be applied to the Future Submarine program.

Sen Fawcett again mastered the art of the submariner understatement: "Stubborn relations between partners led to poor engineering decisions and outcomes."

"For a submariner joining the force today, the force they will be a part of in two decades will be unrecognisable"

Director-General of Submarines Commodore Tim Brown outlined the gains that the Collins fleet has made since the adoption of the Coles review. The fleet has been meeting its material ready days benchmarks for over a year, the submarine workforce has grown by 45 per cent in the past three years, and the Collins fleet participated in over two dozen exercises in 2018 with 2019 set to be even busier.

CMDR Brown also referred to the perennial workforce issue.

"For a submariner joining the force today, the force they will be a part of in two decades will be unrecognisable," he said.

Rear Admiral Greg Sammut, head of the Future Submarine Program, confirmed that Collins will be the main submarine capability of the ADF into the 2030s while the transition to the Future Submarine comes together.

He was also honest in his [summation of priorities](#) and where the submarine capability sits in the ADF's order of battle. "[The Future Submarine] is not a capability that will take precedence over all over ADF capabilities in terms of funding," RADM Sammut said. He then confirmed that the budget of the program has not changed since the end of CEP to choose the design partner.



HMAS Waller enters Jervis Bay during a visit to the East Australian Exercise Area.

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RADM Sammut also noted that successful management of projects of concern, where Collins featured for years before it was removed in October 2017, requires a reset of relationships rather than contracts. In this sense, the timing of the [strategic partnering arrangement](#) (SPA) is about making sure the relationship starts off on the right foot.

Head of Naval Group Australia John Davis and head of Future Submarine for Naval Group France Jean-Michelle Billig confirmed that both businesses are working towards the SPA and are engaging with Australian SMEs as details come together.

“Smoke is not the level of excitement we’re looking for”

“This contract is not just about delivering 12 submarines,” Billig said. “It’s about Australian sovereignty in the long term.”

The detailed practical and policy steps of how this would be achieved over the life of the program were sparse from both Naval Group presenters. Billig did confirm that their AIC plan and strategies have now been approved by the Commonwealth and are in the first of three phases.

“We’re engaging and qualifying companies right now.”

Jim Burnside from ASC provided some industry led insights on the second day on how Collins came together and is now performing.

“Collins was contracted [so that] the first boat would be the same as the last boat,” Burnside said (an approach the Future Submarine will not be taking). “This approach evolved as the program progressed.”

He also confirmed that 70 per cent of the build program was Australian, with 90 per cent of dollars spent on Collins sustainment heading to Australian industry.

“LOTE is a great engineering challenge for our team as we develop our workforce,” Burnside said. “Collins wasn’t designed as a 3D model, but we now have that available in our PLM system as we move towards a digital twin approach.”

My favourite understatement of the event came from Peter Chaplin of PMB Batteries, the company which has supplied batteries for the Collins program from the beginning.

“Stuff catching on fire isn’t great,” Chaplin said. “There’s still a lot of work to be done in getting the balance right in submarine battery technology. Smoke is not the level of excitement we’re looking for.”

The company has dedicated approximately half of its 60-strong workforce to R&D efforts, noting that the global environment for battery-related patents is booming with thousands of new patents filed annually.

MOST READ ONLINE AT WWW.AUSTRALIANDEFENCE.COM.AU



1. [New mast for HMAS Arunta](#)
2. [NIOA tests new weapon coating for ADF](#)
3. [Europeans look to ASC for submarine expertise](#)
4. [AIDN National and DTC relationship on the mend](#)
5. [US Navy and RAN demonstrate cooperative engagement capability](#)

MilCIS 2018: ICT evolution and challenges on show

Ewen Levick | Canberra

The annual Military Communication and Information Systems conference (MilCIS) took place in Canberra this week, showcasing the latest information and communication technologies (ICT) with updates from the military on major projects and the challenges the sector faces.

“How do we apply limited people, limited money, and limited time to get the innovation outcome we all agree we need?”

Defence’s Chief Information Officer Stephen Pearson opened proceedings by acknowledging challenges he’s faced during his time in the role, along with a roadmap for major projects currently underway.

“I’ve been in the job for about nine months, and it’s been a massive learning experience,” Pearson said. “There’ll still be some bumps in the road. We’ve had a few. I can say that we’ve got a lot of great collaboration with our partners... I’m confident we’ll get there.”

Pearson also gave some updates on the Enterprise Resource Planning (ERP) and Enterprise Information Management (EIM) programs.

“EIN is on track for government approval in February. This is a critical program for Defence... it’s a key enabler of our fifth gen warfighting capabilities.”

“It’s also a time for us to review the [ERP] program strategy. It’s a time for us to recalibrate and look at our own resources and how we’re using industry and [delineating] roles and responsibilities.”

Rear Admiral Michael Rothwell, head of ICT Operations in CIOG, outlined the full scope of Defence’s [current network operations](#).



CIOG Stephen Pearson opening the MilCIS conference.

MICHELLE KROLL/UNSW

"Across 400 locations, we have: 120,000 work stations; 230,000 network connections; 110,000 desktop phones; 10,000 servers; 30,000 mobiles; 14 data centres; 50 floating data centres; and one million annual service requests."

In a panel discussion afterwards, ADM pressed Pearson on what information he will take to government following former DIO director [Frank Lewincamp's review](#) into the ERP, and whether the program is still on track to meet planned timelines.

"We're course correcting for ERP," Pearson answered. "We're looking at how we are going to operate ERP in conjunction with EIN. The timeframe for the landings of those is part of what the review looked at and we're still unpacking that."

"We have some tenders out that I can't discuss that will help us plan. So, we're looking at alternative ways to undertake this [project]."

Dr Andrew Dowse of Edith Cowan University, formerly head of ICT Operations and Strategic J6 in Defence, pointed out that Australia's investment in research and development is decreasing relative to other OECD states.

"The R&D component is essential to systems that are best of breed, not just off the shelf," Dr Dowse said.

Some of the program highlights included a brief by LTCOL Mick Hose on the [JP 9102 satcoms project](#), who gave some insight into how his team identified Defence's operational ICT needs.

"We took the model of two joint task forces (JTFs) deployed simultaneously," he said. "That's two JTFs in 2025 with every terminal lighting up at the same time."

"We looked at historical and commercial trends dating back to 1991 on how the demand for [data] is increasing. It's not flat, it's not linear – it's exponential."

On the basis of thorough modelling involving all three military services, LTCOL Hose posited that two JTFs will require transmission speeds of up 1.8 gigabits per second in a primary coverage area between the 91st and roughly 160th meridians east, with secondary and tertiary coverage areas over the rest of the globe.

A separate panel discussion on innovation saw some interesting back and forth between participants. COL Shaun Love, Director Land Network Innovation, opened with a soft rebuke of previous speakers.

"My aim is to counter some of the commentary that has happened over the last couple of presentations. That isn't to denigrate what they said, but [disagreement] is a fundamental of innovation."

"Perhaps the real impediment to innovation is this audience, and I count myself amongst you."

"Agility requires someone to be a bit funky. To think outside the square. And that requires a framework where you have to accept risk and embrace failure as a pathway forward. That's difficult to do when we're beholden to a nation that presses government on how it applies its funds."

"I don't think any of us disagree with you," COL Dan Hartigan, Director Joint Command and Control, said. "The question is how do we apply limited people,

"The R&D component is essential to systems that are best of breed, not just off the shelf"

limited money, and limited time to get the innovation outcome we all agree we need?"

"We need to yearn to learn," Love replied. "There's an environment of learned helplessness that bounds us down a path of set process."

GPCPT Jerome Reid, Director Plan Jericho, argued that budget is no impediment to innovation.

"We all have a responsibility to make some hard decisions and carve out the time and money to innovate," he said.

"Just saying 'we don't have the money'? I don't buy that."

Further coverage of MilCIS will be available in the December/January edition of *ADM*.

Autonomous Warrior gets underway at Jervis Bay

Julian Kerr | Jervis Bay

Autonomous Warrior 18, the largest autonomous systems exercise yet undertaken in Australia, kicked off on 5 November in the Jervis Bay area and will continue until 23 November.

Hosted by DSTG and the RAN, the exercise is demonstrating the benefits of autonomous systems in various warfare formats while providing industry with an opportunity to display its technologies in support of ADF operations in the maritime, littoral and land environments.

The exercise, centred on HMAS *Creswell*, involves 450 participants from 42 organisations, including strong US and UK representation, and builds on the outcomes across multiple warfare areas of Exercise Unmanned Warrior 16 held in Scotland.



The Sun Ray underwater flying wing on display at Autonomous Warrior.

JULIAN KERR

The themes in the current exercise revolve around fleet base protection, counter-arms smuggling, and support to an army foot patrol.

The base protection element includes operations under routine surveillance conditions as well as dynamic response or re-tasking against coordinated attacks across multiple domains.

Counter-arms smuggling involves a scenario in which a suspect fishing vessel enters Jervis Bay, intelligence is gathered by air, surface and subsurface autonomous systems, the vessel throws arms overboard while being pursued (and captured) after which unmanned underwater vehicles locate and identify the dumped arms down to the level of their serial numbers, and a recovery operation is put in place.

Army patrol support utilises both air and ground autonomous systems for intelligence, surveillance and reconnaissance support.

Included as a component of the broader exercise, a 'Wizard of Oz' trial involving the Technical Cooperation Program (TTCP) of the Five Eyes nations (US, UK, Australia, Canada and NZ) will test the advanced Allied Impact (AIM) command and control system.

Combining technology developed by the five nations, this allows the control and operation of multiple vehicles by a single operator. Currently each unmanned vehicle generally has a low degree of autonomy and is controlled by multiple operators.

Anticipated outcomes include the force multiplier effect of small teams of human operators controlling a large unmanned fleet in a dynamic threat environment, an interoperability architecture for autonomous systems and command and control, integration of autonomous technologies across the Five Eyes community, and faster military decision cycles.

The RAN's exercise lead, Commander Paul Hornby, said the scenarios would test the limits of current capabilities.

The 38 autonomous platforms on display at HMAS *Creswell* comprise 13 air vehicles, eight ground vehicles, 14 sea surface vehicles, and three underwater vehicles. Of these, 26 Australian and international participants are providing live demonstrations of their technologies.

Notable among the participants is the UK's MAST (Maritime Autonomy Surface Testbed) system, a 34-foot unmanned surface vessel based on the innovative bladerunner hull shape and capable of speeds of up to 48 knots. The MAST can be operated at various levels of autonomy from basic remote control up to fully autonomous navigation.

Unmanned air vehicles include the US Super-bat, Flamingo and Tempest, unmanned ground vehicles include an Israel Aerospace Industries 6x6 combat support vehicle with a three-tonne payload, while Sydney's Ron Allum Deepsea Services provides a glimpse of the future with its prototype Sun Ray high performance autonomous glider for long-endurance undersea surveillance.

Developed with Defence funding, the Sun Ray is an underwater flying wing with a variable ballast engine that can be flooded or pumped out to change the vessel's buoyancy.

"Anticipated outcomes include the force multiplier effect of small teams of human operators controlling a large unmanned fleet"

Three SA companies win DTC awards

Supashock, Airspeed, and REDARC Electronics have received awards from the Defence Teaming Centre (DTC) at its annual awards ceremony in Adelaide.

Motion technology company Supashock received the “Outstanding Collaboration” award, SME Airspeed won the ‘Growing or Emerging’ award, and REDARC Electronics won the ‘Resilient and Adaptive’ award.

Premier of SA Steven Marshall and Assistant Minister for Defence David Fawcett were the guest speakers, and Minister for Defence Christopher Pyne appeared via video link.

DTC CEO Margot Forster said the quality of all nominees was a testament to the excellence of Australia’s defence industry.

“The calibre of the applications received this year was astounding and the judges had an incredibly difficult task,” Forster said. “I congratulate all of the winners.”

Adelaide-based Supashock received the award for [the development](#) of its Advanced Load Handling System technology for heavy logistics trucks alongside SA manufacturer Century Engineering and Rheinmetall.

The Supashock team developed the ALHS 17 to automate the loading and unloading of ISO containers, modules and flat racks of up to 17 tonnes from within a highly protected truck cabin. This allows soldiers to remain within the protection provided by the truck’s armoured cab.

Supashock Managing Director Oscar Fiorinotto paid tribute to his team of engineers – each recruited from SA’s three universities – for their skill in developing the ALHS 17.

“The Supashock team developed the ALHS 17 to automate loading and unloading from within a highly protected truck cabin”



Supashock received the ‘Outstanding Collaboration’ award from DTC.

SUPASHOCK

"The ALHS17 concept came about because of a unique military operational requirement which identified the need for a load handling system that could be controlled by a single operator, from within the protection of an enclosed cabin in a Rheinmetall logistics truck," Fiorinotto said.

Fiorinotto also said that Century was critical to the successful execution of the product.

"Century Engineering provided specialist fabrication and manufacturing services for the development of ALHS 17 and, from a collaboration perspective, they opened up their business and worked with our team to provide support in the areas where it was required," he said.

"The combination of Century Engineering's manufacturing support, Rheinmetall's experience in the defence sector, and Supashock's expertise in motion technology facilitated the creation of a technology and end product that has life-saving benefits in combat environments."

Fiorinotto thanked the DTC for its recognition of Supashock's collaborative efforts.

"Our entire team would like to acknowledge the DTC not just for this award, but for providing valuable advocacy for SA businesses operating in the defence industry."

ADF officer to lead UN force in Cyprus

The Secretary-General of the UN, António Guterres, has announced the appointment of the ADF's Brigadier Cheryl Pearce, on promotion to Major General, as Force Commander of the UN Peacekeeping Force in Cyprus (UNFICYP).

"This is only the second time the UN has appointed a woman to lead a peacekeeping mission"

Brigadier Pearce has a distinguished record of service, including operational service with the UN in East Timor in 2002 where she was awarded a Chief of Defence Commendation for bravery, and as Commander Task Group Afghanistan in 2016. Her most recent appointment was as the Commandant of ADFA.

The UN Peacekeeping Force in Cyprus was established in 1964 to prevent a recurrence of fighting between the Greek and Turkish Cypriot communities. The force monitors the ceasefire and provides a buffer zone between the two groups.

The force consists of over 1000 personnel from 10 contributing nations, including the UK, Argentina and Slovakia. Australia has provided police officers to this mission for 53 years.

Minister for Defence Christopher Pyne congratulated Brigadier Pearce and said this was a great opportunity for Australia to contribute to global peacekeeping efforts, and to mark its commitment to the UN.

"Australia has a long and proud history of contributing to international peacekeeping and peace building efforts," Minister Pyne said.



CDF General Angus Campbell walks with Brigadier Cheryl Pearce in Kabul during her time as Commander Task Group Afghanistan.

DEFENCE

"The UN's selection of an ADF officer to lead its force in Cyprus is testimony to the high regard in which our contribution is held by the international community.

"This is only the second time the UN has appointed a woman to lead a peacekeeping mission, and it is an important mark of our commitment to enhancing the participation of women in peace and security activities."

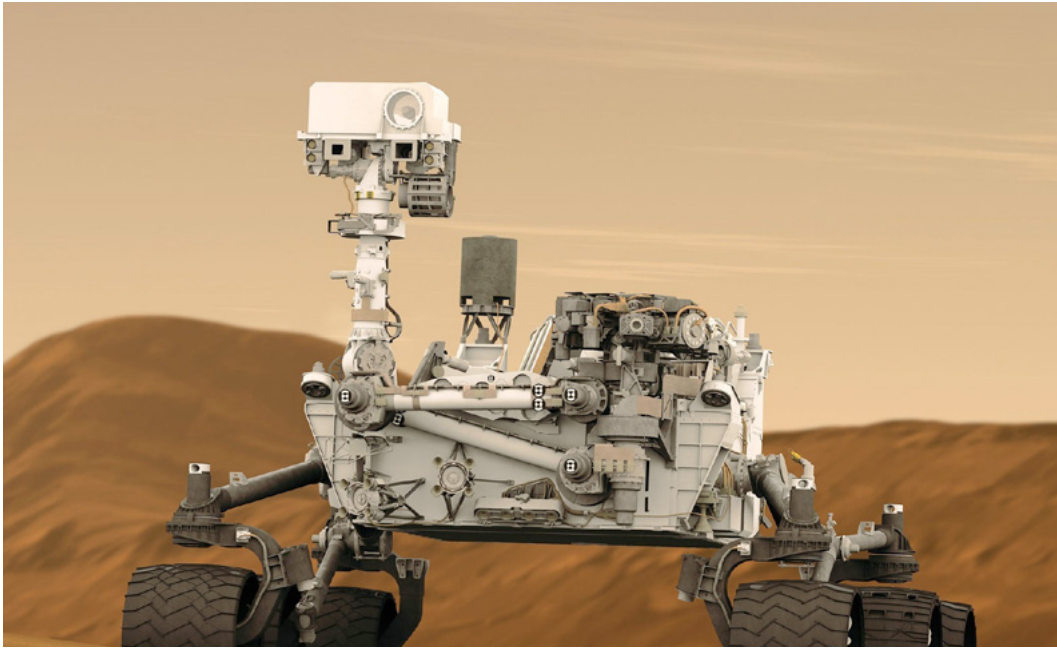
"I welcome the appointment of Brigadier Cheryl Pearce as Force Commander of the UN peacekeeping mission in Cyprus," Minister for Foreign Affairs Marise Payne said. "The involvement of women in peacekeeping operations, especially at senior levels, enhances the prospects of reaching sustainable peace. I wish her every success in her role."

Australia currently has a number of ADF personnel serving in peacekeeping roles in the Middle East and Africa.

Siemens announces half-billion-dollar software grant to UQ

Siemens has announced a software grant with an in-kind commercial value of over half a billion dollars to the University of Queensland (UQ).

The Siemens PLM software grant will provide UQ students access to the Siemens Digital Innovation platform.



The software will allow UQ students access to software used to design the Mars Curiosity rover.

PIXABAY

“This partnership will equip our students with the tools that are being used to design and develop everything from Space X to the Mars Curiosity Rover”

The announcement was made by Siemens Australia Chairman and CEO Jeff Connolly at UQ’s Atrium in Brisbane, supported by Queensland’s Premier and Minister for Trade Anastacia Palaszczuk and Professor Høj, Vice Chancellor and President of UQ.

“Put simply, for Australia to take advantage of the opportunities that come with the fourth industrial revolution, we need to build a future workforce now, with the skills needed to participate – and that’s exactly what this grant is about,” Connolly said. “Partnerships such as this with the University of Queensland are critical to giving students exposure to digital technologies being used by leading companies globally.”

“I welcome the grant from Siemens into our State and look forward to their continued collaboration with our local researchers and students at University of Queensland to progress our industry not just in Australia, but globally,” Premier Palaszczuk said.

The announcement is linked to the recommendations and work of the Prime Minister’s Industry 4.0 Taskforce – an industry led group established to support improved bilateral relations between Australia and Germany.

This is the fourth in a broader strategic program of software grants, which to date have included [Swinburne University of Technology](#), University of WA, and [University of SA](#).

Professor Peter Høj, Vice-Chancellor and President of UQ said the partnership would ensure students were prepared for the evolving nature of the workforce.

“A civil engineering project team will be able to test city traffic flows and use artificial intelligence to adjust the model in response to new scenarios, while physiotherapy students could use design and simulation tools to develop rehabilitation programs to optimise patient recovery.

"This partnership will equip our students with the tools that are being used to design and develop everything from Space X to the Mars Curiosity Rover, Maserati Ghibli and other world-leading innovations," Professor Høj said.

New partnership for subs and shipbuilding programs

UK defence and security electronics system specialist SEA has signed a memorandum of understanding (MoU) with [Daronmont Technologies](#).

The MoU means the two companies will bring advanced combat and communications systems to specifically address RAN requirements outlined in the Future Submarine and Hunter Class Frigate programs.

Initial activities will see the establishment of a specialist cell at Daronmont's facility in Adelaide next year that will be populated by SEA training and simulation capabilities.

The company will also bring to Australia its open-architecture communication system and vendor-independent weapons launcher system to meet Future Submarine and Frigate requirements.

"SEA's objective is to bring the best of today's technology to Australia to enable world-leading future naval combat and mission systems development," Steve Hill, Managing Director SEA, said.

"The inherent synergies that have been identified between SEA and Daronmont – including our collective experience and capabilities – means that we have high confidence in our ability to deliver leading-edge technology solutions combined with recognised indigenous experience in Australia. Collectively, both of our enterprises stand in a unique and established position."



The two companies will bring combat and communications systems to address requirements outlined in the Hunter Class Frigate program.

BAE

“Daronmont is excited by the opportunities for technology transfer and local capability growth that will be enabled through the MoU with SEA”

Daronmont CEO Ben Norris said that the new partnership has potential to significantly enhance the quality of locally-sourced industry content and components for both the Sea 1000 and 5000 programs.

“Daronmont is excited by the opportunities for technology transfer and local capability growth that will be enabled through the MoU with SEA in the short term, as well as the longer-term potential to develop Sovereign Industry Capability in SA,” Norris said.

“Congratulations to SA’s Daronmont Technologies and the UK’s SEA on their strategic partnership to work collaboratively on major Australian naval shipbuilding projects,” Defence SA

Chief Executive Richard Price.

“It’s fantastic to see our innovative local companies forging international partnerships to maximise business opportunities and play a critical role these once-in-a-generation naval shipbuilding programs.”

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Forthcoming Events

ADM EVENTS

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

- [ADM Congress 2019](#) – 13 February 2019

HPRnet Symposium 2018

Date 28 November

Location Curtin University

Website <https://www.dst.defence.gov.au/event/hprnet-symposium-2018>

The 2018 HPRnet Symposium will be held on 28 November at Curtin University in Perth, in conjunction with the Defence Human Sciences Symposium. The annual HPRnet Symposium provides an opportunity for members of the network, and those with an interest in human performance, to hear the latest developments in human performance research for the military.

Defence Human Sciences Symposium 2018

Date 29-30 November

Location Perth

Website <https://www.dst.defence.gov.au/event/defence-human-sciences-symposium-2018>

The Defence Human Sciences Symposium (DHSS) is the principal Australian forum for those interested in the application of human sciences research to enhance Defence capability. The symposium is run annually, and this year being jointly hosted by DST and Curtin University. The theme for this year's symposium is "Minder, Mentor, Minion, Mate: Warfighter roles in Future Complex Systems".

ASOR DORS 2018 Conference

Date 04-06 December

Location Melbourne

Website <https://www.confer.nz/asor-dors2018/>

The 26th Annual Conference ASOR/DORS 2018 brings together research in optimisation, operations planning, informatics, operations research, defence, simulation and modelling of industrial operations, statistics and big data analytics.

BMT's Submarine Design & Engineering Course

Date 10 Dec – 14 Dec, 2018

Location University of South Australia

Website <http://www.bmtdesigntechnology.com.au/training-courses/submarine-design-engineering>

BMT's Submarine Design and Engineering Course presents attendees with the latest thinking and innovations in submarine design and operations. The course provides students with a complete understanding of conventional submarine technology, and our experienced presenters explain how capability requirements and new technologies can impact overall submarine design and management. The course is also accredited by the Royal Institution of Naval Architects.

Avalon Airshow 2019

Date: 26 February – 3 March 2019

Location: Avalon Airport

Website: <https://www.airshow.com.au/airshow2019/index.asp>

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.

IMDEX Asia 2019

Date 14-16 May

Location Changi Exhibition Centre, Singapore

Website www.imdexasia.com

Coming to its 12th edition, the biennial IMDEX Asia is Asia Pacific's premier international maritime defence show and a must-attend event in the global naval and maritime security calendar. With established conferences and real-time discussions on maritime security, IMDEX Asia draws a plethora of global leaders and distinguished guests.

Paris Air Show

Date 17-23 June 2019

Location Le Bourget

Website <https://www.siae.fr/en/>

The 53rd Paris Air Show will once again bring together all the players in this global industry around the latest technological innovations. The first four days of the Show will be reserved for trade visitors, followed by three days open to the general public.

Pacific 2019

Date 8-10 October 2019

Location Sydney Convention Centre

Website www.pacific2019.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.

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.