

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



Australian Army officer trainees conduct a patrol during the Royal Military College training activity near Townsville, Queensland. DEFENCE

Major changes afoot in the north

Julian Kerr | Darwin

Significant potential changes to the ADF's training environments in Queensland and the NT were foreshadowed at ADM's recent [Northern Australia Defence Summit](#) by Brigadier Mark Brewer, Director-General US Force Posture Initiative.

A former Director General Training Army, BRIG Brewer referred to planning for next generation training areas at Shoalwater Bay and a new training area west of Townsville, currently being undertaken by the [Australia-Singapore Military Training Initiative](#).

Lessons learnt from this process could later also be applied to investments in training areas in northern Australia anticipated as part of the US Force Posture Initiative.

"I think we need to ask ourselves whether our traditional approach of heading out into the bush or flying over it and training on areas that have fixed and field firing ranges with a few containers stacked on each other which we call an urban facility is actually now fit for purpose," BRIG Brewer said.

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"At the moment I would observe that our training area design ideas culminate at developing roads, creek and river crossings, camp accommodation and range control. We also tend to develop ranges in service silos.

"Surely there is more to it."

BRIG Brewer acknowledged that Army had made great progress in integrating constructive simulation with live simulation into live training, and stitching non-contiguous training areas and joint capabilities into a single training environment as part of that.

However, there was a need to integrate space and cyber environments into the

"We need to train against a threat with capabilities asymmetric to our own"

more traditional training environments, support the use of robotics and autonomous systems, and be able to provide a repeatedly integrated joint training environment even to small team training.

"In my view we need to favour investing more in the network mesh and the emitters and system emulators than in the camp accommodation we build," BRIG Brewer commented.

"In my mind it won't be so much about fixed small arms and vehicle ranges – it will be more about autonomous and mobile targetry with a shootback capability – I'm talking lasers not rounds – that can integrate with a live and constructive force to provide the sternest test we can conceive to our people, platforms and systems – on land, sea, air and in cyberspace.

"We need to train against a threat with capabilities asymmetric to our own."

Open discussions would be held with defence industry, bilateral partners and DST Group to ensure an adaptable approach for the incorporation of technologies and development, BRIG Brewer stated.

Also addressing the defence summit, Commodore Ian Murray, Deputy Commander Joint Logistics, disclosed that in view of the vast distances associated with movement in the NT and the legislative challenges around the movement of specific commodities, Defence was re-evaluating the benefits of rail.

"In addition to general freight and armoured vehicles, Defence is also considering the use of rail to support the movement of bulk explosive ordnance and fuel," CDRE Murray said.

NSW Defence Innovation Network bridges academia and industry

Ewen Levick | Sydney

The NSW government launched the [Defence Innovation Network \(DIN\)](#) at Parliament House in Sydney on Tuesday, bringing together industry and academia to boost the state's defence sector.

"R&D is a key driver of innovation, and economic and defence benefits will flow to NSW and Australia thanks to the Defence Innovation Network bringing together our best researchers and our defence industry," Minister for Trade and Industry Niall Blair said at the launch.

"NSW universities have diverse capabilities in defence-related technologies including artificial intelligence, autonomous systems, aerospace, radar, sensors,



Professor Hugh Durrant-Whyte, Dr David Kershaw, Minister Blair, Senator David Fawcett, Air Marshal (Ret'd) John Harvey, William Hutchinson, CMDR Peter Scott opening the DIN.

DEFENCE INNOVATION NETWORK

signal processing, material sciences, quantum sensors and advanced human performance," NSW Chief Scientist & Engineer Professor Hugh Durrant-Whyte said.

"These capabilities provide excellent opportunities for NSW defence businesses to accelerate their R&D and deliver innovative defence technologies to the ADF and our allies."

The launch day saw a range of presentations by prominent figures in industry and academia on the innovative work they're doing in the Defence space.

Dr Linda Matthews of UTS spoke on the success her team has had in using large images laid on the ground with custom-designed pattern architecture to fool the software in commercial drones.

"The patterns we've developed have profound disruptive effects on drones and aircraft," Dr Matthews said. "Flight control systems disabled, obstacle avoidance disabled, massive visual tracking errors to the point where the drone didn't know where it was."

Mark Baker from Sonartech Atlas spoke on the challenges of innovating in a sector characterised by the tension between public accountability and the nature of human learning.

"Defence has a fear of failure that is a hurdle [for innovation]," Baker said. "But humans learn more failure than from success. Defence also takes a long time. But I encourage you to stay on course," he said. "That way we can all have success."

The DIN has also announced a partnership with the Australian Mathematical Sciences Institute to invest \$230,000 to place 30 specialist PhDs in defence over three years.

Co-funded under APR.Intern's National Research Internship Program (NRIP), the internships will match PhDs to NSW defence companies to develop skills and deliver innovative technology.

"Economic and defence benefits will flow to NSW and Australia thanks to the Defence Innovation Network"

Australia should consider nuclear subs: ASPI

Ewen Levick | Sydney

RADM (Retd) Peter Briggs has released a [report](#) through ASPI calling for the government to give serious consideration to acquiring nuclear-powered submarines (SSNs).

Briggs makes the case that there are “compelling strategic and submarine capability arguments” whilst acknowledging that “quite [formidable challenges](#) would need to be overcome.”

These arguments rest on what Briggs identifies as the comparative deficiencies of conventionally-powered submarines in a deteriorating strategic environment.

“The deteriorating strategic outlook justifies serious reconsideration of whether acquiring even the most advanced conventionally powered submarine will be adequate,” Briggs argues. “Conventional propulsion systems don’t have the same levels of flexibility, endurance, and covertness that nuclear-powered submarines enjoy when operating in an environment characterised by advanced submarines, surveillance and acoustic systems.

“That’s the environment that Australia’s future submarines will operate in.”

Specifically, the report notes that the deterrent value of Australian submarines will rely on their “on-going ability to access areas critical to an adversary” and “inflict unacceptable harm to [the adversary’s] interests.”

Those needs may be best met in future by an SSN force, which offers a number of advantages: unrivalled mobility; the ability to operate “independently of the surface”; the ability to remain undetected under instance space and air surveillance for much longer than a conventional submarine; and the ability to operate



The US nuclear-powered submarine Pre-Commissioning Unit (PCU) *Indiana* departs to conduct sea trials in the Atlantic Ocean. US NAVY

“Conventional propulsion systems don’t have the same levels of flexibility, endurance, and covertness that nuclear-powered submarines enjoy”

in low sea states densely populated by small boats.

Importantly, the report does not make the case for changes to the Future Submarine program as it stands.

“The technical complexities, manpower demands and long lead times to achieve a nuclear propulsion capability mandate growth in Australia’s conventional submarine force as envisaged under the FSM program. It’s an essential starting point... and will provide our frontline capability for several decades until a future nuclear propulsion program can yield results.”

The report notes that there are immense challenges to overcome for an Australian SSN force to be realised: the need to build a significant workforce, which the author estimates could take 15 years; a personnel requirement of between 2,900 and 5,800 depending on the crewing model used; timing the transition to avoid a capability gap; and the current lack of an Australian nuclear power industry (although the absence of commercial competition for nuclear expertise could be an advantage for the RAN).

The most significant and sensitive issue, of course, is cost. As Briggs acknowledges; “Whether the gain in capability justifies the expense is unknown at present.”

Regardless, the need to investigate remains.

“The information derived by studying the option could not only be used to inform the Australian Government’s strategic decision-making but could also lead to a better informed public debate,” Briggs concludes.

How to user-proof a military vehicle

Emma Cygan | Pailton Engineering

Military vehicles endure extreme conditions during their lifetime. How can the steering systems of these vehicles take on temperatures as low as minus 40 degrees Celsius?

It’s not just low temperatures that are problematic for military vehicles; other challenges include moisture and road debris. Solid environmental testing can address these issues in the design process.

The environmental testing process for steering systems needs to be bespoke to the vehicle and end application. For example, a military vehicle used for semi-submersed and wading applications will have different requirements to an armoured vehicle designed for warfare. Bespoke tests should be arranged based on the [end application](#).

While all military vehicles can differ, when it comes to the environmental testing of military-grade steering components, there are some crucial parameters to consider that form three core tests:

Salt spray test

A salt spray test rig uses up to six steering parts at a time to test resistance against salt spray at varying temperatures. This rig is a large container with a



An ASLAV from 2nd Cavalry Regiment conducts a river crossing.

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rotary arm that controls the movement of steering components, normally at a rate of one cycle every three seconds.

The salt spray test does not necessarily represent dirt or grit but mimics any debris that might enter a part, potentially causing it to corrode or fail. The test can use varying concentrations of salt, with higher concentrations for the more extreme applications faced by military vehicles.

For example, a test could check the effects of repetitive salt spray, with periodic temperatures of -40 degrees Celsius - this is the automotive industry standard for low temperature testing. This will ensure the steering system can withstand grit on the roads, even at low temperatures.

The results will illustrate changes in torque, rate of corrosion, overall effect of grit on the vehicle and its steering system, as well as any potential for water ingress.

Rotary submersion

The same test rig can also be used to test the system against other factors, such as water. During rotary submersion, the parts are fully submerged in water. If a part can endure underwater movement at one cycle every three seconds at varying temperatures without corroding or failing, then it can confidently be used in the end environment.

Other developments include using different finishes and upgraded sealing and greases to improved design features and pass rotary submersion testing.

Low temperature evaluation

Low temperature testing also forms a standalone test for military steering systems. Low temperatures can bring about issues with the

“The environmental testing process for steering systems needs to be bespoke to the vehicle and end application”

viscosity of the fluid in lubricated components, which can have detrimental effects on steering torque or even cause parts to lock up entirely.

Using a low temperature chamber, parts can be tested at as low as -40 degrees Celsius for a set period of time based on the end application. This low temperature can be applied constantly or periodically for dynamic testing. The parameters measured in this test include assessing changes to the part caused by low temperatures, checking rotation and measuring torque.

In short, there are plenty of variables to consider when developing a steering system for military applications. In accounting for these variables, the testing process should always be designed to the needs of the end user.

Note: Emma Cygan is a design and development engineer at Pailton Engineering.

**“I really hope
this inspires
other veterans
in the future to
do great things”**

BenchOn nominated as Power 50 veteran-owned business

BenchOn has been nominated to be part of the Sage Power 50, an inaugural collection of businesses that is a unique showcase of 50 leading veteran run or owned businesses from across Australia, the UK, US, and Canada.

Nominated for leadership and determination to succeed, the Power 50 is a unique collection of testimony from veteran entrepreneurs on how they built their business against the odds. The Power 50 reveals the challenges, sacrifices and tough decisions that will underpin the transition into business for many veterans, as well as the advice and insight that helps to reshape service honed skills into the world of entrepreneurship.

“We are extremely honoured to have been selected to be part of the Sage



Veteran-owned business BenchOn's Power 50 nomination comes ahead of the Invictus Games in Sydney, an event showcasing the remarkable abilities of veterans.

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Power 50,” Tim Walmsley, CEO of BenchOn said. “It’s great to see what the veteran community is achieving in business all in one place, it’s very inspiring.”

[BenchOn](#) was included in the Sage Power 50 along with other innovative veteran-owned Australian businesses including BCT Solutions, Mirragin Aerospace Consulting, Major Freedom and StevTech.

“We’re proud to be part of the vibrant, veteran owned business community, and excited to share this recognition with our former Defence colleagues and business compatriots,” Angus Heatley from BCT Solutions said. “The Sage Power 50 goes to show that the skills, knowledge and experience you develop in your Defence career are highly valued in the private sector and can help achieve great things in business.”

“Every single story in the Power 50 is undeniable proof that when barriers are removed that prevent millions of veterans from living their fullest life after service—it isn’t just the right thing to do, it’s sound business,” Debbie Wall, VP Sage Foundation, said.

“We believe that with tailored support, mentoring and early intervention, a new generation of veteran led businesses could unleash a wave of talent and innovation across the global entrepreneurial community. Together with our non-profit partners, we are committed to helping more veterans secure a brighter future.”

“I really hope this inspires other veterans in the future to do great things,” Walmsley added. “BenchOn will continue to do our part in supporting the veteran business community and help not only our Defence Industry to thrive, but also our Defence community.”

MOST READ ONLINE AT WWW.AUSTRALIANDEFENCE.COM.AU



1. [BAE bids for LHD sustainment](#)
2. [First Japanese lithium-ion equipped sub launched](#)
3. [New coating halves rate of biofouling on RAN ships](#)
4. [F-35s grounded worldwide after crash](#)
5. [Safran to transfer submarine tech to Australia](#)

Broadspectrum launches Indigenous engagement plan

Reconciliation Australia has joined Broadspectrum to launch the company’s fourth Reconciliation Action Plan (RAP) at Chinchilla in Queensland.

The launch comes off the back of successes the company has had in this space. Broadspectrum has successfully increased Indigenous employment from 2.2 to 4.8 per cent, contributed \$88 million to the national economy through the Indigenous employment program, and won the Supplier Diversity Advocate of the Year Award at the Supply Nation’s 2018 awards.

The latest RAP for 2018 to 2021 outlines actions the company will take to



Broadspectrum has successfully increased Indigenous employment from 2.2 to 4.8 per cent.

BROADSPECTRUM

provide opportunities for Indigenous [people and businesses](#).

"As a services provider with operations across remote and regional Australia, our legacy is focused on building the skills, talents and experience of Indigenous people and businesses to ensure they can secure meaningful employment and opportunities with Broadspectrum and other businesses," Broadspectrum's Managing Director and CEO Nick Miller said.

"Broadspectrum's targets in its 2018 to 2021 RAP include doubling Indigenous procurement to support 100 businesses"

"We are also committed to creating career pathways for Indigenous people, including into leadership positions. By 2021, we hope to have 6.5 per cent Indigenous employment in our business."

"We care about what we do and the people we work with, and this has been a strongly held value throughout our company's 60-plus years of operations. These values led to us being the first services company to launch a RAP in 2009, and our latest RAP strengthens our ongoing commitment to share our success with the communities where we work."

"Broadspectrum's fourth Reconciliation Action Plan will continue to deliver positive and far-reaching economic and behavioural transformations, contributing significantly to national reconciliation," Reconciliation Australia's Deputy CEO Andrea Kelly said.

Broadspectrum aims to employ another 450 [Indigenous talent](#) by 2020, partly through a contract with the Prime Minister and Cabinet. The company is also part of the Emerging Indigenous Executive Leaders Program run by UNSW, which promotes Indigenous leaders in businesses.

The launch of Broadspectrum's fourth RAP was commemorated by a commissioned artwork – Chinchilla on Charlies – by students from the Chinchilla

State High School, working with local Barunngam Elder Uncle Reg Warner and Broadspectrum employee and Indigenous artist Anthony Turnbull. The artwork was also reproduced and wrapped on a vehicle and hard hats, which will be displayed throughout select operations in the Surat Basin region of Queensland.

Broadspectrum's targets in its 2018 to 2021 RAP include doubling Indigenous procurement to support 100 businesses, support 10 Indigenous interns per year over a decade in partnership with CareerTrackers, work with government to create a framework to enable Indigenous people with minor criminal records to gain meaningful employment, and build a formal mentoring program that results in a four per cent Indigenous representation in the company's "High Potential" employee talent pool.

ADF supports APEC security in Port Moresby

The ADF is supporting hosting of APEC 2018 in the Papua New Guinean (PNG) capital Port Moresby. Australia is understood to be subsidising up to a third of the cost for hosting the event.

The ADF is providing specialised capabilities to enhance local security arrangements already in place in Port Moresby, providing planning and coordination support, maritime security assistance, airspace security and additional niche capabilities.

"This support is at the request of PNG. Our ADF will be working closely with the PNG Defence Force and will have our assets integrated into the PNG Joint Security Task Force," Minister for Defence Christopher Pyne said.

The ADF has a number of personnel providing planning assistance to the PNG Defence Force with additional forces arriving in the lead up to Leaders Week.



Commanding Officer HMAS Adelaide Captain Jonathan Earley talks with PNG Prime Minister Peter O'Neill.

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“ADF support during Leader’s Week will include around 1,500 personnel”

ADF support during Leader’s Week will include around 1,500 personnel, a joint headquarters with the PNG Defence Force, air-space security provided by the RAAF, maritime security support provided by the RAN, and additional niche capabilities to enhance the PNG Defence Force’s Incident Response Group.

“We are committed to supporting our regional partners and promoting a secure and prosperous region,” Minister Pyne said.

“The ADF’s assistance to the PNG Defence Force includes high-end capabilities, integrated planning and training support.”

“The ADF’s contribution to our whole of government package of security support for APEC 2018 is an extension of our deep historical, political, defence and economic ties with PNG,” Minister Pyne added.

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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

BMT's Whole Life Warship Capability Management course

Date: 22-26 October 2018

Location: Adelaide

Website: <http://www.bmtdesigntechnology.com.au/training-courses/whole-life-warship-capability-management/>

BMT's Whole Life Warship Capability Management course is run over five days and is accredited by the Royal Institution of Naval Architects. The course covers: warship concept development and design management; regulation, seaworthiness and safety systems; platform systems and fundamentals of naval architecture; above and below water battlespace systems; production, sustainment and cost engineering.

WA Indo-Pacific Defence Conference 2018

Date 30 October 2018

Location Crown Towers – Perth, WA

Website <http://perthusasia.edu.au/defence-forum-2018>

The 2018 Western Australian Indo-Pacific Defence Conference will convene strategic thinkers from the military, industry, academic and government in Perth, home to Australia's largest naval base, a growing defence industry, and a vibrant civic and academic community. This conference will promote the State's defence capability to national and international defence stakeholders. The aim is to provide new and relevant information from high-level speakers to educate and inspire our local industry, and to assist them in becoming world class and globally competitive (export ready).

NZDIA 2018 Forum

Date 30 October – 1 November 2018

Location Central Energy Trust Arena, Palmerston North (NZ)

Website <http://www.nzdiaforum.co.nz/page/528148>

The 2018 NZDIA Forum is our 21st forum. We aim to bring together industry (local, regional and international) and a wider range of government interests than has been achieved previously. The NZDIA forum has, for 20 years, been the most important event on NZ soil for defence and industry to come together. This year we are creating the opportunity and space for a wider cross section of industry: local, Australasian and global with a broader interest in national security encompassing defence, to come together. The speaking and workshop program is coming together as we identify how best to deliver excellent value to our traditional constituency and new attendees.

Veterans Film Festival

Date 1 November – 3 November

Location Palace Electric Theatre, ADFA, Canberra

Website www.veteransfilmfestival.com

The RSL National Veterans Film Festival (VFF) is an annual event, putting the spotlight on stories about veterans, first responders, their families and the influence of warfare on our society. The festival presents a curated program of carefully selected feature films, short films and media art from Australia and around the globe. Our focus is on recent work by talented indie filmmakers. However, within our program we also present mainstream films, retrospectives and provide opportunities to meet with filmmakers and content creators via Q&A's, panels, etc. All films submitted to the official competition will be eligible to compete for the coveted Red Poppy Awards.

SIA Biennial Conference

Date 7-8 November 2018

Location Rex Hotel, Canberra

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.

ACA Corrosion & Prevention 2018

Date 11-14 November 2018

Location Adelaide Convention Centre

Website <http://www.corrosion.com.au>

As always, the focus of the ACA's annual conference and trade exhibition will be the safe and effective management of the continuing challenge posed by corrosion. More than 400 delegates are expected to attend the conference and extensive exhibition supported by key industry suppliers. Industry experts will deliver five plenary presentations—including the F P Thompson Lecture, which will be delivered by Professor Brian Kinsella, Curtin University, Australia.

MilCIS 2018

Date 13-15 November 2018

Location National Conference Centre, 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.

Australian Warrior Expo

Date: 15-17 November 2018

Location: Brisbane Showgrounds, Exhibition Building

Website: www.australianwarriorexpo.com.au

The Australian Warrior Expo (AWE) is Australia's premier Law Enforcement, Military, Emergency Services and Security Expo and is the only event of its type in Australia. AWE is dedicated to showcasing the latest products, technology, equipment and services to this niche market. AWE will bring both professionals and agencies together including Government Procurement Managers, Decision Makers and Operators.

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.

TEAM DEFENCE AUSTRALIA EVENTS

- **Euronaval 2018** – 23-26 October 2018, Paris, France
- **Indo Defence 2018** – 7-10 November 2018, Jakarta, Indonesia

For more information go to 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.