AUSTRALIAN AVIATION
Australian Defence Business Review

AVALON 2017 SHOW DAILY
TUESDAY FEBRUARY 28

CAF launches Air Force Strategy for next decade of change

Chief of Air Force Air Marshal Leo Davies has released details of the Royal Australian Air Force's new strategic document that will inform how the RAAF continues its journey towards becoming a fifth-generation force over the next decade and beyond.

Against the backdrop of increasing strategic uncertainty and complex operational challenges, Air Force Strategy 2017-2027 prioritises those critical areas in which significant change must occur.

The document outlines five 'vectors' through which the transformation of the RAAF will be pursued: joint warfighting capability; people capability; communication and information systems; infrastructure; and international engagement.

"Joint fighting is the number one vector; it is the effect we are after, but I really would quickly swap those in terms of priority and say without the right people pieces we will not be able to generate that joint force," CAF

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SHOW HIGHLIGHTS

AVALON BEGINS

Welcome to Avalon 2017

Welcome to the 2017 Australian International Airshow and Aerospace & Defence Exposition. Avalon 2017 will showcase "Air Power in Action" with a spectacular line up of military, commercial, civil and vintage aircraft from Australia and around the world.

Since 1992 the Australian International Airshow and Aerospace & Defence Exposition has helped promote the development of Australia's aviation, aerospace and defence industries. It has established a powerful international reputation as being amongst the most comprehensive and significant aviation, aerospace and defence events in the Indo-Asia Pacific region. It's no coincidence that civil and military aerospace markets in Australia, and the region more generally, are undergoing significant growth: Avalon 2017 is a gateway to business opportunity.

The Airshow and Exposition are conducted by Aerospace Australia Limited, a not-for-profit organisation that is part of a national not-for-profit group headed by the Aerospace Maritime and Defence Foundation of Australia Limited. Our altruistic purpose is to promote the development of Australian industry capabilities: we provide an international showcase for Australian industry as well as a meeting place for potential partners, and customers – truly, we take Australia to the world by bringing the world to Australia.

We work constantly to improve facilities for our exhibitors and other key industry stakeholders. That includes enhancing the conference facilities

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JETS AT AVALON IN STRENGTH

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F-22 headlines major US military presence at Avalon 17

A flying display by a US Air Force F-22 Raptor will be the highlight of another considerable presence of US military aircraft at the Avalon Airshow.

Three F-22s from the 90th Fighter Squadron based at Joint Base Elmendorf-Richardson, Alaska will be at Avalon with the aircraft showcased in the flying display by a pilot from Air Combat Command's F-22 Demonstration Team, 1st Fighter Wing, Joint Base Langley-Eustis, Virginia.

Also on display will be a B-1B Lancer from the 36th Wing, Andersen Air Force Base, Guam; F-16 Fighting Falcons with the 35th Fighter Wing, Misawa Air Base, Japan; and KC-135 Stratotankers with the 18th Wing, Kadena Air Base, Japan, as well as a US Navy P-8A from VP-16 on detachment to Misawa Air Base Japan.

"The US military is honoured to participate in and represent the US at Avalon 17," a Pacific Air Forces statement reads.

"Support to airshows and other regional events allows the US to demonstrate its commitment to the stability and security of the Indo-Asia-Pacific region, promote standardisation and interoperability of equipment, and display capabilities critical to the success of military operations. It also serves to strengthen long-standing military-to-military relations between the US and Australia."

The aircraft will be supported by some 80 US military personnel.

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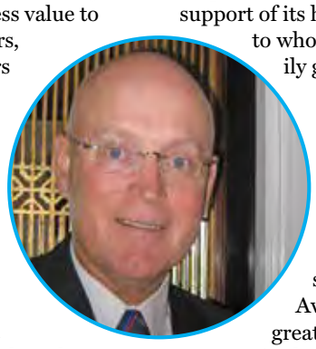
at Avalon to support an unrivalled program of conferences, seminars and symposia held in conjunction with the event.

Avalon 2017 promises as always to deliver added business value to its industry stakeholders, exhibitors, trade visitors and delegations, along with an exciting flying display program featuring state of the art technology and some of the world's best pilots.



The event could not continue to play a leading role in the Asia Pacific Region without the substantial support of the Government of Victoria and the Australian Department of Defence (especially through the RAAF) and the City of Greater Geelong.

The Australian International Airshow and Aerospace & Defence Exposition could also not continue to operate without the enthusiastic support of its hundreds of volunteers, to whom we are extraordinarily grateful.

The extensive array of aircraft on static display, combined with the action-packed excitement and high-powered entertainment of the aerial spectacular, make Avalon one of the world's great air shows.

Avalon 2017 will truly be a celebration of 'Air Power in Action'.

Air Marshal Geoff Shepherd (Rtd), Chairman, Aerospace Australia Limited

CONTINUED FROM PAGE 1

said, speaking to the media on the sidelines of the Chief of Air Force Symposium in Melbourne on Monday.

Air Force Strategy 2017-2027 is intended to ensure that the culture of innovation, integration and 'jointness' embodied in Plan Jericho continues, with one of its vectors focusing on enabling the joint force to communicate and do so securely.

"It is amazing to me that we as an Air Force have in the past put a priority on an F-35 and not the runway or the base, or the comms or the joint or the people, or the international engagement," CAF said.

"I will trade one F-35 for a base that can fly the remaining 71 F-35s that Government have already approved; I would swap that in a heartbeat. That is a total change."

Setting the scene for the symposium with the opening address, Deputy Chief of Air Force Air Vice-Marshal Warren McDonald described how Australia's first two F-35As had landed in Guam on their way to Australia, having been refuelled by the KC-30A and supported by a C-17A.

Meanwhile, the first four EA-18G Growlers have arrived at Amberley and the first two PC-21 trainers arrived at East Sale in recent days, with the first P-8A already in Edinburgh and another due in mid-March.

But as attractive as that new lineup might sound, the intention is that the focus will no longer be on the platforms themselves.

"As modern warfare progresses, glue projects will become more than just enablers; they will be the core of combat capability and likely displace the dominance of the platform. As such, these projects are becoming increasingly important to the Australian Defence Force of the future," AVM McDonald said.

MANAGING EDITOR & PUBLISHER
Gerard Frawley

EDITORIAL TEAM
Jordan Chong, Robert Nutbrown, Trevor Thomas, Max Blenkin, Owen Zupp, Paul Sadler, Tim Frawley

DESIGN & PRODUCTION
Daniel Frawley

ADVERTISING & MARKETING
Louise Harry

PHOTOGRAPHERS
Seth Jaworski & Paul Sadler

PUBLISHER
Phantom Media Pty Ltd
ABN: 50 112 691 666
PO Box 3926,
Manuka ACT 2603,
Australia.

Phone: (02) 6232 7474
Fax: (02) 6260 6747
mail@australianaviation.com.au

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EXERCISING FIFTH-GEN

F-35A passes first Red Flag test with flying colours

The US Air Force has praised the "outstanding" performance of the F-35A at Red Flag 17-1, which marked its debut at an iteration of the air-to-air combat training exercise at Nellis Air Force Base in Nevada.

The fifth-generation fighter not only achieved a 'kill' ratio of about 20:1 but also maintained greater than a 90 per cent mission capable rate during the exercise, which ran from January 23 to February 10.

"The F-35 performance in Red Flag 17-1 was outstanding," said Lieutenant General Jerry Harris, US Air Force Deputy Chief of Staff for Strategic Plans and Requirements, in a statement provided to the House Armed Services Committee.

"Aircraft and crews integrated seamlessly with all other participants, delivered a dramatic increase in Air Force capability and significantly enhanced the capabilities of the entire force of 80 aircraft taking part in the exercise."

With 13 F-35A aircraft deployed at the exercise, 207 of 226 planned sorties were executed with no maintenance non-deliveries.

"Nineteen sorties were mission cancelled by the Red Flag staff for weather, not due to F-35 limitations: that is simply an awesome effort," said Lt Gen Harris, addressing the committee on February 16 in Washington.

"The airplane is doing exactly what we need it to do."

The F-35A recorded 145 air-to-air 'kills' versus seven losses, none of which involved the fighter being detected by radar.

The aircraft employed 51 simulated weapons against surface-to-air missile sites, destroying 49 of them, which is a much better success rate than would have been achieved by fourth-generation aircraft, Lt Gen Harris said.

"They were 92 per cent successful on their heavyweight weapons delivery, which is far exceeding where we expected to be this early in the development phase," he added.

The RAAF deployed 200 personnel to Nellis to train alongside counterparts from the US and the UK, and an E-7A Wedgetail AEW&C platform and a C-130J Hercules tactical airlifter flew missions during the exercise.

The RAAF deployed a range of capabilities, from a combat control team that parachuted in freezing conditions to a dry lake bed for an airfield survey to air battlespace managers that controlled movements and datalinks for both friendly and 'enemy' aircraft.

The participation of the F-35A, and the US Navy's EA-18G Growler, gave the Australians exposure to capabilities that are coming into service with the RAAF.

Commander of the Australian contingent Group Captain Stuart Bellingham described the large force employment combat training exercise that provides a complex and highly advanced threat environment in which to practise high-end warfighting "as realistic as it gets".

"By coming here, we're preparing for high-end war fighting, so we can deploy at short-notice on operations, and have confidence that we are going to be successful," GPCAPT Bellingham said.

"We'll take information and training back and feed it into our force preparation, and will translate into our current operations."

An important aspect of the training focused on personnel that were embedded within the Combined Air and Space Operations Centre (CAOC), which was responsible for planning the Red Flag missions and ensuring they were coordinated with space and cyber-based efforts, which can be contested by an aggressing force.

GPCAPT Bellingham was the first non-US participant to be Director of the CAOC, leading 250 American, British and Australian personnel. This was the first time a coalition nation has performed this role in such an exercise.

"We are integrated with these capabilities from start to finish, from planning missions, through to debriefing the missions," GPCAPT Bellingham said.

"Australia has air battlespace managers from No. 2 Squadron and No. 41 Wing who are controlling the Red Flag airspace, and getting first-hand experience how these capabilities can be employed.

"We're getting real insight into understanding the capabilities and what Australia's future is going to look like."

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PIAGGIO AEROSPACE

Schiebel Camcopter S-100 wins Navy VTOL UAS deal

The Department of Defence has awarded Austria's Schiebel Group a contract to supply its Camcopter S-100 to meet the Royal Australian Navy's interim vertical takeoff and landing (VTOL) unmanned aerial system (UAS) requirement.

Signed in late December, the contract fulfils a request for tender (RFT) for Navy Minor Project (NMP) 1942 which sought to procure a "proven" VTOL Maritime Tactical Unmanned Aircraft System – Interim Capability (MTUAS-IC) and associated engineering and logistics support for the Navy.

The RFT brief said the MTUAS-IC looks to "extend and enhance the intelligence, surveillance and reconnaissance capabilities of a parent unit or ship to increase situational awareness using a variety of sensors".

Featuring a carbon fibre and titanium fuselage, the S-100 has a maximum takeoff weight of 200kg and can carry a 34kg payload of electro-optics and infrared sensors for up to 10 hours. It has a maximum speed of around 120kt and is powered by a 55hp (41kW) Diamond piston engine.

The S-100 VTOL UAS has a beyond line-of-sight capability out to 200km. Able to fly fully autonomously, it can be operated from a pilot control unit with missions planned and controlled via a simple point-and-click graphical user interface. High definition payload imagery is transmitted to the control station in real time.

In August, the S-100 will embark on a Navy Adelaide class FFG to conduct vertical takeoff and landing trials.

General Atomics to launch 'Team Reaper Australia'

General Atomics Aeronautical Systems is set to officially launch an industry team for the AIR 7003 Phase 1 Medium Altitude Long Endurance Unmanned Aerial System project at Avalon today.

Representatives of Cobham, CAE Australia, Raytheon Australia and Flight Data Systems are scheduled to attend the event on Tuesday morning.

General Atomics will be displaying an MQ-9 Reaper turboprop-powered remotely piloted aircraft, otherwise known as the Predator B, and its Advanced Cockpit Ground Control Station at Avalon.

The Integrated Investment Program that was published with the 2016 Defence White Paper outlines a plan to acquire an armed unmanned aircraft to provide an integrated and persistent intelligence, surveillance, reconnaissance and attack capability to support the Australian Defence Force and coalition forces. The project, known as AIR 7003, reached 'gate zero' in early November.

Avalon Airshow to feature drone showcase

The Avalon Airshow will devote part of the week-long event to discuss the practical applications of remotely piloted aircraft (RPA), or drones.

Avalon's "Drone Showcase" is on from Friday to Sunday and its conference program includes sessions on the use of these aircraft in industry, in filming and photography and for safety search and rescue operations.

There will also be a one-hour session on drones in agriculture, with three speakers offering insights into how these aircraft, which have rapidly grown in popularity in recent times, can improve the lot of farmers.

Elders senior economist Brad Donald will cover the practical uses of RPAs for crop inspections and crop spraying, while University of Adelaide engineering lecturer and Defence Science and Technology Group consultant Leonard Hall will talk about the technical aspects of deploying drones in regional Australia.

Also, qualified drone pilot Wayne Lording will share his experience of using RPAs on his own property near Yea in central Victoria.

The trio will speak on Saturday March 4 between 1000-1100 and again at the same time on Sunday.

Attendance at the 'Drones in Agriculture' conference is free to all attendees who have purchased a standard ticket to the airshow.

Centre fuselages for next RAAF F-35s in production

No fewer than six centre fuselage sections for the RAAF's next batch of F-35A Joint Strike Fighters are currently in production at Northrop Grumman's F-35 Integrated Assembly Line (IAL) at Palmdale, California.

The fuselage sections are for six of the RAAF's next eight F-35As, which are scheduled for delivery in 2018, after the first two Australian jets (AU-1 and AU-2) were handed over in 2014.

"We've currently delivered two aircraft to the Australian Air Force, we have six aircraft that are [currently] in our assembly process, [and] we'll actually deliver seven this year," Corey Carruth, the F-35 IAL's director of manufacturing, told Australian media during a tour of the Palmdale facility last month.

"One of the next units we'll deliver off our assembly line is AU-3, the third Australian unit, we'll deliver it to Lockheed Martin in March."

Following the delivery of the centre fuselage of AU-3 in late March, AU-4 and 5 will follow shortly after in April, Carruth said.

The next eight Australian jets are being built as part of the F-35's low rate initial production (LRIP) batch 10.

To date Northrop Grumman has delivered over 300 F-35 centre fuselages from its Palmdale IAL, which uses the same building that it assembled the B-2 Spirit stealth bomber in. Today the IAL is delivering a centre fuselage to Lockheed Martin every three days with a production flow time of 164 days.

"We'll actually be increasing this year to a day-and-a-half production interval, meaning we'll deliver an airplane every day and a half and start a new airplane every day and a half," Carruth said. "We'll get down to about 110 days total flow."

Northrop Grumman delivered the first RAAF F-35 centre fuselage for AU-1 in October 2013. AU-1 and AU-2 have been based at Luke Air Force Base, Arizona since late 2014 as part of the International Pilot Training Center there. Of the next eight jets, two will ferry to Australia in 2018 for Australian operational test and evaluation, while the other six will be based at Luke for pilot training before being ferrying to Australia in 2020.

PILATUS LANDS THREE NEW PC-21 CUSTOMERS

Pilatus Aircraft has announced the signing of three PC-21 pilot training aircraft orders, together worth the equivalent of more than $400 million.

The French air force is set to receive 17 of the aircraft, which will be used to train future military pilots, and two are destined for the Royal Jordanian Air Force.

"I am delighted we have finally won another European air force for our PC-21. An exceptionally rigorous selection process based on the strictest of criteria provides further proof that the PC-21 is the first choice worldwide for training military pilots," said Oscar Schwenk, Pilatus chairman.

"I am proud that our best-selling PC-21 is now destined to fly for 'la Grande Nation'. France is already the 8th air force to choose the PC-21: these orders included, we will soon have a total of 209 PC-21s flying successfully from bases around the world."

Meanwhile, QinetiQ has placed an order with Pilatus for two PC-21s that will be based at MoD Boscombe Down, marking the first step in the company's modernisation of the Empire Test Pilots' School fleet.

"Pilatus is pleased to be part of the program of modernisation at QinetiQ Test Aircrew Training. Our PC-21 will provide a training platform for the next generation of test pilots worldwide," Markus Bucher, chief executive of Pilatus, said.

"That a global leader in the test flight sector decides to replace ageing Hawks and Alpha Jets with the PC-21 is a tribute to our product's performance and flexibility."

Separately, Australia has ordered 49 PC-21s for the RAAF under the AIR 5428 Pilot Training System program. The first two PC-21s arrived in Australia in February ahead of their appearance at the Avalon Airshow.

AIR 5428 training devices taking shape

Lockheed Martin is in the final stages of integration and testing of the first of seven flight training devices it is building for the RAAF's new PC-21 turboprop-based Pilot Training System ahead of first delivery to Australia in the third quarter of this year.

The device is an evolution of that Lockheed Martin supplied for the Republic of Singapore Air Force's Basic Wings Course program (which operates the PC-21 from RAAF Base Pearce). Its features include a functional replica of the PC-21's front cockpit, a dome with a near full-field-of-view visual system and an instructor operator station which incorporates advanced display and control technology to support instructor demonstration, direction and monitoring of training sequences.

The device has been under development and testing in Lockheed Martin's Training and Logistics Solutions' 1,100 square foot laboratory in Orlando, Florida, in close consultation with the RAAF.

As well as flight training devices Lockheed Martin is also supplying a fully electronic classroom environment, including the 'Prepar3D'-based cockpit procedures trainer (CPT), which features a fully functioning touchscreen, hands on throttle-and-stick (HOTAS) controls and a virtual instructor to guide students through complex training tasks.

The Lockheed Martin-led 'Team 21' includes Pilatus and Hawker Pacific and is supplying 49 Pilatus PC-21 aircraft plus the training devices and CPTs under a seven-year, $1.2 billion contract signed in late 2015. Pilatus is supplying the PC-21 aircraft, the first of which arrived in Australia in late February ahead of the Avalon Airshow, while Hawker Pacific will provide maintenance support for the aircraft.

The three companies have operated Singapore's BWC program from Pearce since 2009.

The initial undergraduate pilot training 'wings' course on the PC-21 is planned for early 2019.

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Boeing delivered the Royal Australian Air Force its first EA-18G Growler. The world's most advanced electronic attack aircraft, the EA-18G will provide Australia with a formidable information-age capability and play a central role in the RAAF's 'Plan Jericho' for a networked airborne fleet. EA-18G will help realise the RAAF's vision for greater situational awareness, survivability and mission effectiveness for all Australian defence forces.

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WHEN RESULTS MATTER

BUSINESS AVIATION

Embraer brings Phenom 300 and Legacy 450 to Avalon

Being a market where the bulk of business jet sales involve pre-owned aircraft has not deterred Embraer Executive Jets from investing in Australia in the quest for new customers.

Embraer Executive Jets vice president for sales and marketing in the Middle East and Asia Pacific Claudio Camelier says Australia is a huge market for used aircraft, while sales of new aircraft have, in recent times, been small in number.

"There hasn't been so many deliveries of new airplanes in Australia in the past few years," Camelier told *Australian Aviation* in an interview on the phone from Dubai ahead of the Australian International Airshow.

"In spite of that, it is definitely a market in which we invest and we spend a lot of time there because there are still a certain number of opportunities for sales of new airplanes."

In addition to its efforts to secure new aircraft sales, Camelier said Embraer was still participating in the market through its pre-flown aircraft sales unit.

"Not that this is an issue for Embraer. Not at all. We do have our pre-owned, we call them pre-flown, airplane division where we sell airplanes that we have taken on trade from other customers," Camelier said.

"For us, if it is a pre-flown or new airplane we will be dedicating exactly the same effort to the customer in terms of support after the delivery.

"The customer experience that we provide to the buyers, be it a pre-flown buyer or a new buyer, is exactly the same."

Further, any sale of a pre-flown aircraft to a new customer had the potential to lead to a new aircraft sale some time down the track when the owner was looking to upgrade.

Embraer has six business jets based in Australia – three Phenom 100s, one Phenom 300, one Legacy 500 and one Legacy 600.

The total business jet fleet in Australia comprised about 200 aircraft, with roughly half in the light jet category.

"What we have seen over the past four, five years is an almost stable market for business jets in Australia. We haven't seen the fleet growing very much," Camelier said.

Australia had a strong culture of business aviation and general aviation and had a friendly environment for owners and operators of these aircraft despite much-publicised challenges regarding curfews, customs and border processing and slot availability at busy times, Camelier said.

"Operating a business jet in Australia is a relatively easy thing to do when compared to some other regions in the world where there are a lot of restrictions for business jet movements," he said.

"The good thing about Australia is it is a market where users – business, high net worth individuals – they are familiar with the benefits of business aviation.

"They understand business aviation, they know how business aviation can make their travels more efficient."

Embraer Executive Jets planned to have two aircraft on display at Avalon – the Phenom 300 and the Legacy 450.

The company delivered its first Phenom 300, which seats six passengers and has a range just under 2,000nm, to an Australian customer in January. Meanwhile, it will be the first time the Legacy 450 will be seen in the Asia Pacific region.

Although the number of Embraer aircraft coming to Avalon 2017 was down compared with the four business jets the Brazil-based manufacturer brought to the 2015 event, Camelier said this had more to do with aircraft availability rather than any reflection of current market conditions.

"Bringing in the Phenom 300 and the Legacy 450, it will be very positive for us," Camelier said.

"We are bringing in the most delivered airplane in the world in the past few years and the newest airplane in our portfolio, being able to show all the technology, all the cabin comfort features of the airplane.

"This time around unfortunately we didn't have as many airplanes available to bring to the airshow but I do believe we will still have a very strong presence there."

The introduction of ultra long-haul business jets such as Gulfstream's G650ER, which can operate between Los Angeles and Melbourne nonstop, have proved to be well received in Australia, given their range capabilities.

While ultra long-range jets is not a market that Embraer competes in – the Brazilian manufacturer's Lineage 1000E tops out at 4,600nm – Carmelier said the company was continually studying this particular segment.

However, he noted Embraer currently had its hands full with new aircraft programs at its commercial aircraft and military divisions.

"Embraer for sure has all the technical capabilities to develop a very good airplane in that particular market segment," Camelier said of ultra long-range aircraft. "But that's not the focus for the company right now."

"Our engineering teams at Embraer, they are pretty much busy with the development of the KC-390 for the military market and the E-Jets E2.

"So right now we don't have I would say availability, resources, to develop a new airliner because most of our engineering resources are focused on these new designs for commercial and defence."

Meanwhile the focus for those working in the executive jets division was to "consolidate our presence in the market and consolidate our product line".

Camelier said market conditions in North America, the world's biggest market for business jets where 60 per cent of new aircraft are purchased and where two-thirds of the installed fleet is based, were good as customers and operators absorbed the impact of the change in US president.

There were also encouraging signs from China, which had suffered a significant drop in demand in recent times as the government's anti-corruption crackdown and economic uncertainty kept potential buyers in the shadows.

Although conditions were unlikely to go back to the boom times of a few years ago, Camelier was upbeat about the prospects for Embraer in China.

"The worst is already behind us," Camelier said of China.

"We definitely see recovery signs there and more customers asking about the possibility about acquiring new airplanes."

Raytheon Australia marks 2,500 EW support missions

Raytheon Australia's Electronic Warfare Training Services (EWTS) has completed 2,500 flight missions in support of the Royal Australian Navy and the Australian Defence Force.

Using two heavily-modified Learjet 35A jet aircraft fitted with advanced electronic warfare systems, Raytheon's Electronic Warfare Training Services conducts missions ranging from EW system training, test, experimentation and evaluation trials, to radar jamming and deception, communications denial and deception and radar threat simulation.

"Our 16 year relationship with the Royal Australian Navy in the provision of electronic warfare training and simulation services attests to the strength of our trusted partnership with the ADF," Raytheon Australia managing director Michael Ward said.

The electronic warfare mission system on the two Learjets has been designed and built for expansion and upgrade, catering for training against emerging threats, and are supported by real-time signal monitoring and response through a comprehensive mission management and recording capability, enabling full mission playback and analysis.

In the last two years, Raytheon and the Commonwealth have co-invested more than $5 million to significantly upgrade the capability.

"Exploitation of the electromagnetic spectrum will feature as a key element of the future battlespace. As the warfighter faces new and emerging threats, a strong partnership with defence industry will contribute to the safety of the warfighter and security of our nation," Ward said.

"Looking to the future, world-leading electronic warfare capability will contribute to the foundation for increased defence and industry co-operation, enabling Raytheon and the ADF to further develop sovereign capability together."

The first RAAF P-8A overflies the AWD NUSHIP *Hobart*.
DEFENCE

First AWD starts sea acceptance trials

NUSHIP *Hobart*, the first of the three Hobart class DDGs, departed from the wharf at Techport Australia in mid-January to begin a second round of sea trials off the coast of South Australia.

These sea acceptance trials follow the completion of builder sea trials in September.

Air Warfare Destroyer (AWD) program manager Commodore Craig Bourke said that this second phase of more advanced trials will test the ship's full suite of mission systems, involving both platform systems and combat systems.

In order to fully test the ship, NUSHIP *Hobart* will work with a range of fighter aircraft, surface ships and helicopters, as well as civilian platforms, in simulated scenarios.

"These trials are the culmination of all of the preceding design, production, activation, integration and test activities conducted on *Hobart* to date," CDRE Bourke said.

"Sea acceptance trials are a significant milestone for the project as it is the first time that the AWD will be tested as a complete mission system."

ASC Shipbuilding chief executive officer Mark Lamarre stated that the trials provide the formal testing and acceptance phase for the platform.

"Sea acceptance trials further demonstrates the capacity of Australia's sovereign defence industry to build and integrate ships for our specific defence needs, and will prove this highly capable platform ready for delivery to Defence," Lamarre said.

The AWD Alliance is expected to deliver NUSHIP *Hobart* to the Commonwealth in mid-2017.

Project Coorong delivers next-gen capabilities for over-the-horizon radar

A public private partnership (PPP) between Lockheed Martin Australia and the Defence Science Technology Group (DSTG) is focusing on the development of over-the-horizon radar (OTHR) capability – including the ability to track fast small targets at night.

Funded by Lockheed Martin Australia, Project Coorong showcases the ability of PPPs to deliver innovative and collaborative capabilities on-schedule and under-budget, according to Lockheed Martin Australia Electronic System's general manager, Jack Mahoney.

"Project Coorong demonstrates Lockheed Martin Australia's commitment to engaging, supporting and developing the ability of innovative small to medium enterprises (SMEs) to participate in leading edge technology," Mahoney says.

"The Project was very successful on a number of fronts – it reached its milestones in less than 12 months – ahead of schedule – and brought a number of new SMEs into the program in that time."

DST Group has been researching OTHR technology since the 1970s, culminating in the development and introduction into operations of the Jindalee Operational Radar Network (JORN) which is used to surveil Australia's northern maritime approaches.

"We have worked closely with Lockheed Martin to take an idea and use our joint technical expertise to bring it into reality," Dr Gordon Frazer of the DST Group says.

"Developing leading edge OTHR technological advancements not only benefits our local initiatives, but sets Australia apart in international research and development in this field."

As a key partner in the design, integration, construction and commissioning of the JORN, Lockheed Martin Australia is partnered with the Australian Defence Force in the design, integration and on-going maintenance and support of this national capability.

With the completion of Project Coorong, Lockheed Martin Australia and DST Group will use the outcomes to expand the original research, building on Australia's well-deserved reputation as a world leader in radar and surveillance innovation.

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LOCKHEED MARTIN

USAF F-22s in Australia for joint training with the RAAF

Twelve United States Air Force F-22 Raptors have deployed to RAAF Base Tindal, Northern Territory for joint training exercises with the RAAF as part of the first Enhanced Air Cooperation (EAC) initiative.

The 12 jets are from the 90th Fighter Squadron from Joint Base Elmendorf-Richardson, Alaska, and began arriving at Tindal from February 10.

"The F-22s will conduct integrated training activities with the Royal Australian Air Force's 75 Squadron F/A-18A/B Hornets along with ground assets and personnel," Minister for Defence Senator Marise Payne said in announcing the deployment.

"The EAC will build on a range of air exercises and training activities already undertaken between Australia and the United States."

It is the largest and longest rotation of 'fifth-generation' fighters to Australia to date.

"The rotation of the aircraft is designed to modernise and strengthen our already firm mil-to-mil relationship, facilitate interoperability, exercise combined capabilities and increase regional engagement," a US Pacific Air Forces statement reads.

"While at RAAF Base Tindal, the F-22 detachment, alongside their RAAF counterparts, will provide credible forces able to support a wide range of exercises or training activities."

Those training activities include defensive counter air missions, and offensive counter air scenarios near Delamere Air Weapons Range, among other locations. The visiting USAF F-22 and RAAF Hornets have also deployed to Townsville for short training visits.

An F-22 lands at Tindal. DEFENCE

An F-22 at Townsville. DEFENCE

"Combined training activity will vastly enhance the Royal Australian Air Force's ability to integrate with the United States Air Force's fifth-generation aircraft while introducing fifth-generation operations to RAAF Base Tindal," said Wing Commander Andrew Tatnell, commanding officer of 17 Squadron (the former 322 Expeditionary Combat Support Squadron).

"The training is also important to the Royal Australian Air Force as the latest generation of aircraft and technology, including EA-18G Growler and F-35A Lightning II, come into service in the coming years."

During the visit, the Raptors are being supported by two KC-135 Stratotankers based at RAAF Base Darwin.

The Enhanced Air Cooperation agreement is part of the US-Australia Force Posture Initiative that was signed by the two nations in 2014 and came into effect the following year.

The agreement allowed US forces to be in Australia for activities such as "security operation exercises, joint and combined training exercises, humanitarian assistance and disaster relief as agreed with Australia", the Department of Defence website states.

"The EAC aims to strengthen bilateral collaboration and interoperability with the United States," Minister Payne said.

"While EAC will see an increase in training, it will be on a short-term rotational basis using Australian facilities."

There have been five rotations of US Marine Corps personnel to Darwin since the Force Posture Initiative was signed. A sixth rotation is due to arrive in April, Payne said.

Three F-22s are in attendance at the Avalon Airshow.

'On Wings of Waste' takes flight

There was a significant flight that took place on January 12 at Illawarra Regional Airport near Wollongong.

A two-seat Vans RV-9 set course for Tyabb, Victoria under the banner of the "10 per cent solution". Powered by a single WAM120, three-cylinder turbo-diesel, the 120hp (90kW) powerplant uses conventional fuel blended with 10 per cent fuel manufactured from plastic waste.

Years in the making, the proving flight was piloted by the man behind the On Wings of Waste (OWOW) project – Jeremy Rowsell. Having witnessed plastic waste adrift in the oceans from the air, Jeremy set about inspiring people to recycle plastic, while also seeking to transform waste from a pollutant to a viable alternative for Jet A1 fuel that can also be used in any diesel engine.

"After years of preparation and many ups and downs we've finally shown that the eight million tonnes of plastic dumped into the oceans each year can be put to good use. We blended 10 per cent of fuel manufactured by Plastic Energy with conventional fuel and the flight was a dream," Rowsell reflected.

And potentially, Jeremy's flight could have a profound effect on the aviation industry, given that a significant portion of an airline's operating costs stems from its fuel usage.

The fuel for the flight was produced by Plastic Energy and uses end-of-life plastic, normally found in garbage patches in the ocean and landfill sites where it takes hundreds of years to degrade.

Some 95 per cent of the end-of-life material is usable for diesel fuel and the remaining five per cent, known as 'char', is a solid used for example for fuel additives and pigments.

Rowsell's flight was supported by a small but effective team. Tony Loughran, from Zerorisk International, put him through a series of survival courses including underwater escape training, hostile environments awareness and sea survival training.

Loughran, with Rowsell, has also started to roll out an educational campaign with a lecture program in schools in Australia building a groundswell of support for OWOW. Chief pilot and advanced flying instructor Chris Clark of Five Point Aviation has also been a major driving force.

Rowsell arrived at Tyabb after five hours and 40 minutes of flight time, having burned the blended fuel at a rate of 17 lph. On landing, Rowsell was pleased to report that the "flight was very successful and uneventful".

"It was a true proof of concept," he said.

Rowsell further stressed that such a flight serves to highlight that, "a small group of Australian aviation enthusiasts can truly make a difference".

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Defence investment plan hits first pot hole

A $1.2 billion reduction in the Government's annual equity injection into the Department of Defence's accounts is set to filter through into a roughly half-a-billion dollar cut to the $32.3 billion Defence budget first outlined in the May 2016 federal budget.

The withdrawal of Defence equity funding was revealed in the 2016/17 Portfolio Additional Estimates Statements (PAES) released just prior to the Avalon Airshow.

On top of the change in equity funding – which will also see significant reductions in the Major Capital Investment, Major Capital Facilities and Minors Program spend – Defence resources will be further squeezed in coming years by reductions totalling $288.6 million over the next three financial years (2017/18 to 2019/20) courtesy of savings measures termed as efficiency dividends.

Following the release of the new Defence White Paper in 2016, the Turnbull Government was keen to reverse accumulating declines in Defence resourcing imposed over the previous five years, as part of a long-term election undertaking to return Defence funding to two per cent of gross domestic product (GDP) by 2020/21.

In addition to committing to boost overall Defence funding, the government also undertook to redress long neglected areas within Defence, such as fixing shortfalls in capability sustainment and re-prioritising 'Key Enablers' – which comprise the facilities, integration or support functions that really do make a difference in the Australian Defence Force being able to successfully carry out the tasks expected of it by Government.

According to the figures in the PAES, Defence's Major Capital Investment Program is now set to decline 6.3 per cent (-$457.1 million) to $6,786.1 billion over 2016/17, while the Capital Facilities Program spend will decline 17.5 per cent (-$307.5 million) to $1,450.6 billion.

The Minors Program – which is of particular interest to smaller firms being encouraged by the government to rise to the task of supplying a greater percentage of the Australian Defence Force's overall needs – will decline 37.4 percent (-$31.3m) to $52.5m, from the original $83.8m first budgeted.

Defence is also having to find savings to fund increased costs for operations overseas, with appropriations for Departmental Outcomes being boosted by $810.4m, including $36.1 million in funding for Operation Highroad – NATO-led operation in Afghanistan – whose 2016/17 Budget estimate has quadrupled to $95 million, as part of a total of $391 million expected to be spent by 2018/19.

The reduction in Defence resources, when combined with increased operational costs, largely reflects the net effect of the reallocation of funds between operating and capital, resulting in the reduction in the equity injection appropriation, partially offset by foreign exchange movements which have impacted negatively on Defence funding.

The withdrawal of resources from the overall Defence budget will also see reductions in Defence's Capability Sustainment Program, which is forecast to fall by $73.4 million across the eight sustainment categories prior to an internal adjustment (-$315.8 million) which tracks the movement of funds into the hands of capability managers. Navy and Air Force sustainment have nevertheless been spared from these reductions, with a $38.7 million increase to Navy, and a $65.9 million increase for Air Force – taking its total 2016/17 sustainment allocation to $2,246.4 million.

As at publication date, the PAES notes that 29 projects have been approved in 2016/17, with a further 66 projects approved since publication of the 2016/17 Portfolio Budget Statements, and including a number announced by government but not previously published. The 2016/17 Defence budget papers listed a total of 36 projects to be put up for consideration over that financial year – 10 of which were seeking first pass approval and 23 seeking second pass approval. Another three were proposed to be considered for interim approvals.

Of the 29 project approvals achieved in 2016/17, the PAES provides details of only 13 – three relating to first pass and 10 relating to second pass. The three projects having achieved first pass are:

AIR 5349/6 – Advanced Growler;

JOINT PROJECT 2060/3 – ADF Deployable Health Capability; and

SEA 1000/1&2 – Future Submarine Program.

The ten projects having achieve second pass are:

AIR 5440/1 – C-130J Block Upgrade Program;

ESTATE 2253 – Garden Island Critical Infrastructure Recovery Project – Stage 1;

INV 1/1 - Innovation Hub Launch and Funding;

JOINT PROJECT 157/1 – Replacement National Support Base Aviation Refuelling Vehicles;

JOINT PROJECT 500/2 – Electronic Warfare Operations Support;

LAND 53/1BR – Night Fighting Equipment Replacement Program;

LAND 154/2 – Joint Counter Improvised Explosive Device Capability;

LAND 3025/1 - Deployable Special Operations Engineer Capability;

SEA 1448/4B – ANZAC Air Search and Radar Replacement; and

SEA 1778/1 – Deployable Mine Countermeasures – Organic Mine Countermeasures.

ITALIAN FRIGATE EXPLORES UNCHARTED WATERS

For the crew of Italian Navy frigate ITS *Carabiniere*, visiting Australia offers them a valuable opportunity to practise submarine hunting in unfamiliar conditions during Exercise Ocean Explorer.

The ship is carrying an SH90 NATO Frigate Helicopter (NFH) that is, among other things, fitted with dipping sonar and sonobuoys.

"All the doctrine of the submarine hunt changes because of the shallow water, the salty water, the temperature of the water," explained Lieutenant Gennaro Liotti, chief of the flight department, speaking to the Show Daily on the frigate's flightdeck in Melbourne on Friday.

The Bergamini class FREMM frigate *Carabiniere* has two hangars: one for parking and daily maintenance, and the other for more extensive maintenance activities. The ship is designed to be able to carry either two SH90 helicopters or an SH90 plus an EH101.

LEFT – Lieutenant Gennaro Liotti with his SH90 helicopter aboard *Carabiniere*.

It takes a triangle – Boeing's partnership approach to sustainment

In 2016, Boeing Defence Australia became one of the largest providers of military platform sustainment support services to the Australian Defence Force, building on more than 20 years of delivering sustainment capability services for the Australian military's fixed and rotary-wing aircraft.

The company's first major sustainment program was the F-111 Weapon System Business Unit contract under which Boeing Defence Australia provided through-life support of the RAAF F-111 fleet for close to a decade until the type's retirement in 2011.

Now in 2017 and Boeing Defence Australia is leveraging that experience to deliver an integrated partnership approach to supporting the RAAF's Super Hornet and Growler fleets under the Air Combat Electronic Attack Support Contract (ACEASC).

As prime contractor, Boeing delivers weapon system management, engineering, operational support, logistics and intermediate and deeper maintenance alongside key subcontractors Raytheon Australia and Northrop Grumman Australia.

Boeing Defence Australia's integrated services and support general manager Murray Brabrook says the ACEASC epitomises industry working in partnership with the Commonwealth to enhance capability, support mission readiness and reduce costs.

"The ACEASC operates under a single-management framework that includes both contractor and Commonwealth employees managing all current and future fleet requirements," says Brabrook.

"This includes all upgrades which are tied to the US Navy spiral development program. This approach ensures the fleets keep their capability edge with scheduled capability upgrades approximately every two years.

"We believe this unique collaborative approach will lead to the continued success of Australia's air combat and electronic attack capability and help ensure air superiority for years to come."

As military systems become smarter, so too must Boeing's approach to sustainment.

Boeing notes that the fundamental difference between maintaining an aircraft and maintaining a system lies in cutting code rather than cutting metal, and by addressing technology obsolescence and identifying opportunities.

For example, Boeing Defence Australia's approach to the Vigilare Support Service Contract, under which the company sustains and upgrades the RAAF's Air Battlespace Management System, is focused on ensuring the technology remains relevant.

"Most sustainment contracts operate in a linear fashion, with operators telling the Systems Program Office (SPO) what is required, and the SPO then engaging the contractor," said Brabrook.

"The Vigilare Support Services model is best explained as a triangle, with Boeing, the Wing and the SPO all working together to create the best outcome for Defence.

"In partnership with the Wing and the SPO, we do more than look at the short-term needs around the technology and user interface. We work collaboratively to develop a 10-year roadmap that takes a proactive, long-term strategic approach to how the system will meet the RAAF's needs in the future – rather than being reactive to what's required today."

Boeing says this successful model has also been applied to the E-7A Wedgetail In-Service Support Contract.

RAAF deploys to Guam for Exercise Cope North

The RAAF has deployed an Air Task Group to Andersen Air Force Base, Guam, to participate in Exercise Cope North 2017, which is intended to improve combat readiness and humanitarian assistance procedures, and increase interoperability.

Defence stated that up to 12 F/A-18A 'classic' Hornets from 3 Squadron have been assigned to the exercise, and are operating alongside aircraft from the US and Japan.

In addition, an E-7A Wedgetail airborne early warning and control aircraft is providing a command-and-control capability, and a C-130J Hercules tactical airlifter is providing an airdrop and combat search-and-rescue capability.

"This is the sixth time Australia has participated in the exercise," said Group Captain Tim Alsop, the Australian commander for the exercise.

"Every year we gain more appreciation of how our equipment, aircraft and personnel operate together in this environment. Cope North gives us the opportunity to validate how effective our training is in a complex and demanding air combat scenario."

Cope North 2017 began on February 15 and is due to conclude on March 3. It involves more than 100 aircraft overall.

Technicians carry out after flight checks on a 3SQN Hornet on completion of the first day of missions during Exercise Cope North. DEFENCE

ON APPROACH?

Australia to conduct SBAS trial

Lockheed Martin, GMV and Inmarsat are to participate in a Geoscience Australia-led project that aims to improve the accuracy, integrity and availability of basic Global Navigation Satellite System (GNSS) signals, such as those currently provided by the Global Positioning System (GPS).

In January, the Commonwealth announced it would invest $12 million for a two-year project to trial a Satellite Based Augmentation System (SBAS), which uses space-based and ground-based aids to support GNSS.

Geoscience Australia said the tests would evaluate the effectiveness and application in SBAS across nine industries – agriculture, aviation, construction, maritime, mining, rail, road, spatial, and utilities.

Currently, SBAS is operating in the United States and Europe.

"Highly accurate positioning technologies are already available in Australia, but they are expensive and only available in specific areas and to niche markets," then Geoscience Australia acting chief executive James Johnson said in a statement on January 17.

"Research has shown that the widespread adoption of improved positioning technology has the potential to generate upwards of $73 billion of value to Australia by 2030."

Spanish company GMV will install an SBAS testbed master station, which will collect data from Geoscience Australia-operated reference stations and generate augmentation messages.

That data will be sent via a Lockheed Martin uplink antenna at Uralla, New South Wales to a geostationary earth orbit satellite owned by Inmarsat.

"This satellite rebroadcasts the augmentation messages containing corrections and integrity data to the end users. The whole process takes less than six seconds," Lockheed Martin Space Systems Company director for international strategy and business development Rod Drury said.

In February, Federal Minister for Infrastructure and Transport Darren Chester said New Zealand would contribute another $2 million towards the trial.

"The two-year project will test SBAS technology that has the potential to improve positioning accuracy in the region to less than five centimetres. Currently, positioning in Australasia is usually accurate to five to 10 metres," Chester said on February 17.

"Not only do we use positioning technology everyday through apps like Google Maps but it is essential to all four transport sectors – aviation, maritime, rail, and road.

"Improving positioning technology has the potential to open up a whole range of new opportunities for transport sectors, including building on technological developments in maritime navigation and automated train management systems to a future that includes driver-less and connected cars."

Land Information New Zealand (LINZ), the New Zealand Transport Agency, the New Zealand Ministry of Business, Innovation and Employment, and the New Zealand Ministry of Transport would participate in the trials, Chester said.

Applications from specific industries to join the trial would open in March.

Lockheed Martin Australia and New Zealand Chief Executive Vince Di Pietro said: "We are excited to have an opportunity to work with Geoscience Australia and Australian industry to demonstrate the best possible GNSS performance and proud that Australia will be leading the way to enhance space-based navigation and industry safety."

Regional Aviation Association of Australia chief executive Mike Higgins noted the International Civil Aviation Organization (ICAO) had accepted SBAS as one of the three fundamental augmentation technologies for GNSS.

"Many other states have now deployed or are deploying SBAS around the world. While aviation provided the primary impetus for SBAS development, that industry is now a minor user of the system and its advantages are now recognised across an expanding user base," Higgins wrote in the November 2016 edition of *Australian Aviation*.

Higgins wrote that WAAS, or the wide area augmentation system, which uses SBAS technology, was first deployed in the US in July 2003 to overcome the limitations of GPS and now provides some 4,000 runway approaches across the US, Canada and Mexico.

"It has become the primary Category I landing guidance system in the US replacing ILS, allowing localiser performance with vertical guidance – LPV – approaches down to 250 or 200ft minima."

50th USN P-8A delivered

The United States Navy took delivery of its 50th Boeing P-8A Poseidon maritime surveillance aircraft last month.

Designed for anti-submarine warfare, anti-surface warfare, and intelligence, surveillance and reconnaissance, the P-8A is based on the Boeing 737-800 commercial aircraft and features a Raytheon APY-10 multi-mission surface search radar, an electro-optical/infrared (EO/IR) sensor turret and an advanced acoustic processing capability with 64 passive sonobuoys, 32 multistatic sonobuoys and concurrent passive and active processing.

"The P-8A is special," said Captain Tony Rossi, the US Navy's program manager for Maritime Patrol and Reconnaissance Aircraft.

"This is the first time a Navy combat aircraft was built from the ground up on a commercial production line. We've leveraged commercial expertise and experience, and a highly reliable airframe, the 737, which has reduced production time and overall production costs."

The P-8A's fuselage is built at Spirit AeroSystems in Wichita, Kansas, while final assembly is on a specific P-8A line at Boeing's 737 factory in Renton, Washington State. Mission and sensor systems are then installed at Boeing Field, Seattle.

The US Navy has a 'program of record' requirement for 117 P-8As to replace its P-3C Orions, and declared IOC (initial operational capability) with the aircraft in November 2013.

The P-8A has also attracted international sales from Australia, which is currently acquiring 12 P-8As to be delivered by March 2020 (with the likely approval of a further three planned to take the total fleet to 15), the UK, which is buying nine P-8As for the Royal Air Force, and Norway, which plans to acquire five.

India has acquired the similar P-8I, which features a different search radar and is fitted with a magnetic anomaly detector.

Hawker Pacific to highlight wide range of aircraft at Avalon

Hawker Pacific is set to have a bumper aircraft lineup at Avalon.

The aircraft sales and support company plans to have a Cessna Citation Latitude, Cessna Caravan, Cessna TTX, Cessna 182, Beechcraft King Air C90GTx, a Beechcraft Bonanza G36, Bell 407GX Helicopter, Diamond Aircraft DA40NG and Diamond DA-62 on static display during the show.

Hawker Pacific chief executive Alan Smith said the company would seek to highlight its experience and capability as a comprehensive aviation solutions provider covering aircraft sales, maintenance, repair and overhaul (MRO), fixed base operations (FBO), government business and special missions.

"Hawker Pacific has proudly served the Australasian aviation sector for over 35 years, and Avalon Airshow is an important event for us and the industry," Smith said.

"Avalon is the perfect platform for Hawker Pacific to showcase our expertise as a comprehensive aviation solutions provider."

The Cessna Citation Latitude was most recently in Australia in October 2016 as part of a demonstration tour.

Hawker Pacific offers sales and support services for Textron's Beechcraft, Cessna and Bell Helicopter range, having completed the acquisition of Aeromil Pacific in July 2016.

THE HOME OF DEFENCE?

NSW launches new Defence and Industry strategy

New South Wales has become the first state to devise a specific response to the federal government's publication of its inaugural Defence Integrated Investment Program, which has earmarked $195 billion of investment over the next ten years in new Australian Defence Force capabilities as Defence spending is progressively increased to two per cent of GDP by 2020/21.

Released just prior to the Avalon Airshow, the NSW Government's new Defence and Industry Strategy is entitled 'NSW: Strong, Smart and Connected'.

NSW Minister for Primary Industries, Minister for Regional Water and Minister for Trade and Industry, Niall Blair, confirmed the core of the strategy centred around the creation of a new coordinating organisation to be called 'Defence NSW'.

The new organisation will specifically take on responsibility for coordinating all Defence and defence industry-related activities for the NSW Government, while also being charged with stewardship of the new strategy and responsibility for delivering it across NSW through fostering and utilising regional networks. This approach "will focus the state's support for Defence and industry and provide whole-of-government leadership, advocacy and engagement with the sector," said Blair.

NSW is home to over 80 Defence bases and facilities (said to be more than any other state), with the Department of Defence's operational expenditure in the state estimated at $5.5 billion annually. Defence and NSW-based industry supported by this expenditure are said in the Strategy to directly employ over 26,500 people – representing another first in terms of NSW being able to claim it is home to the highest number of workers with skills relevant to Defence. Added to this is NSW being home to several world-class universities and other leading research and development institutions.

The principal objective of the new NSW Defence and Industry Strategy, therefore, is to bring all these resources more closely together in order to: support Defence in its objectives; assist Defence in the delivery of its acquisition targets; and maximise the economic opportunities for NSW businesses and communities. To achieve these outcomes, the Strategy outlines five key areas of activity, comprising:

Fostering stronger relationships with Defence and across NSW defence-industry at a state and regional level;

leveraging NSW's strengths in critical capability areas to grow existing work and create new Defence and defence-industry activity;

providing Defence and defence-industry with their future workforce;

sustaining and growing existing and new Defence and defence-industry activity across regional NSW; and

increasing opportunities for innovation, commercialisation and research within Defence and defence-industry.

The new Defence NSW organisation will in turn establish itself as:

the contact point for the Department of Defence, defence-related Commonwealth departments, defence companies, defence industry bodies, and defence-related research organisations;

a dedicated organisation that identifies and drives opportunities to collaborate, partner and support the growth of the NSW defence sector;

assuming responsibility for defence and industry attraction and expansion in NSW;

becoming the lead promoter of the state's defence-industry and research capabilities;

supporting access for NSW defence-related companies to procurement and supply chain opportunities both locally and internationally; and

being accountable to and inclusive of key stakeholders in the NSW defence sector.

The new Defence and Industry Strategy accordingly looks well beyond central Sydney for the delivery of its initiatives, with a significant proportion of Defence NSW's service delivery to be coordinated through regional centres. Each centre will in turn be charged with identifying:

a regional organisational sponsor;

a regional implementation plan (which outlines the local region's strategies for sustained growth and responsiveness to emerging Defence and defence-industry needs);

and identifying opportunities and prioritising support (in terms of initiating investment, jobs and exports); and allocating resources linked to need and success measures.

Each regional centre under the new Defence and Industry Strategy will also be responsible for effective relationship management with local Defence establishments and defence-industry stakeholders, and including:

Defence bases and units (particularly in terms of assisting with access to state services and maximising collaboration across the state);

local defence-industry stakeholders in relation to accessing state services and maximising collaboration across the state;

regional Defence industry associations; universities and research universities;

and local councils.

The new Defence and Industry Strategy next breaks down each of the five activity areas into sixteen sub-initiatives designed to achieve desired outcomes, which are then individually mapped to six regions across the state: Sydney (incorporating City/Harbour, Western Sydney and Central West); Northern NSW (incorporating North Coast and New England); South Coast (incorporating the Illawarra and Shoalhaven); the Hunter (incorporating Williamtown, Singleton and Newcastle); and the Capital Region (incorporating Goulburn and Queanbeyan).

While the focus on the new NSW Defence and Industry Strategy appears mainly on ensuring local enterprises maximise their share of Defence's sustainment spend by targeting military facilities across the state, the strategy also proposes to rigorously pursue new Defence business opportunities, such as: the Joint Strike Fighter (AIR 6000); the Air Force's Future Battle Management System (project AIR 6500); Army Combat Vehicles (LAND 400); and the Navy's Future Submarines (SEA 1000), Offshore Patrol Vessels (SEA 1180) and Future Frigate (SEA 5000).

A Tiger ARH is directed onto the deck of HMAS *Canberra* during during first of class flight trials while the ship is alongside at Sydney's Garden Island. DEFENCE

LifeFlight's Dan Tyler awarded for 50 years of incident-free flying

The Federal Aviation Administration (FAA) has presented LifeFlight's Dan Tyler its most prestigious accolade, the Wright Brothers Master Pilot Award, to acknowledge 50 years of accident and violation-free flying, exemplary service, professionalism and devotion to aviation safety.

The US-born Tyler has amassed an impressive number of military and civilian commendations, including the Distinguished Flying Cross and the Purple Heart for his service in the Vietnam War, the 1999 Prince Phillip Helicopter Rescue Award for civil flying achievements, and is one of only two Australian-based pilots to receive the Helicopter Association International Pilot of the Year Award, for his involvement in the 1998 Sydney to Hobart Yacht Race rescue in Bass Strait.

"All of those previous awards are kind of for doing 'something stupid' and getting away with it," said Tyler. "Whereas this award is actually for making sure I did things right."

Tyler began his helicopter rescue career with the Surf Life Saving Association's then Wales Rescue Helicopter Service in 1979. With a Bachelor of Law from Sydney University he would maintain two separate career paths by working as a solicitor and as a rescue pilot for almost 15 years.

"It reached the stage when I had to decide whether I was going to be a lawyer with a pilot's licence or a pilot with a law degree – I decided to be a pilot with a law degree," said Tyler.

"Because there was such a massive let-down from the intensity of your day-to-day life in Vietnam when you returned home, a lot of people just couldn't get along without the adrenaline.

"I honestly believe that I was addicted to my own adrenaline and that is probably why I got into the rescue business. I was gradually able to withdraw from that need to become a very conservative pilot."

With over 11,500 flying hours, Tyler is now the simulation manager at the Thales LifeFlight Simulation Centre, part of LifeFlight's training academy at Brisbane Airport. However, he maintains that the cockpit of a helicopter is where he still belongs.

RAAF marks 5,000 hours of King Air 350 sim training at Sale

During a recent ceremony held at CAE's Sale training centre, Minister for Infrastructure and Transport Darren Chester joined RAAF officers and officials from the company to mark the occasion of the RAAF surpassing 5,000 hours of simulator training since the facility opened in 2014.

The training centre was constructed by CAE as a company-owned/company-operated facility following the awarding of a contract in 2013 to deliver King Air 350 simulator services to RAAF pilots, as well as air combat officers from the RAAF and maritime aviation warfare officers from the Royal Australian Navy (RAN), CAE stated.

"The CAE Sale training centre is a great example of an innovative business model that delivers benefits to both the Australian Defence Force and industry," said Ian Bell, CAE vice-president and general manager for the Asia Pacific and Middle East.

"We brought high-quality training where it was needed at RAAF Base East Sale, and we operate the training centre as a true partnership with the RAAF."

The training centre, which houses a CAE-built King Air 350 full-flight simulator, is available for use by other military and civil customers.

Gulfstream is showcasing its G280, G550 and G650ER corporate jets.

Gulfstream brings three aircraft to Avalon

Gulfstream is displaying three aircraft at the Avalon Airshow.

The Savannah, Georgia-based business jet maker will showcase its flagship G650ER to prospective customers alongside the long-range, large-cabin G550 and the smaller G280.

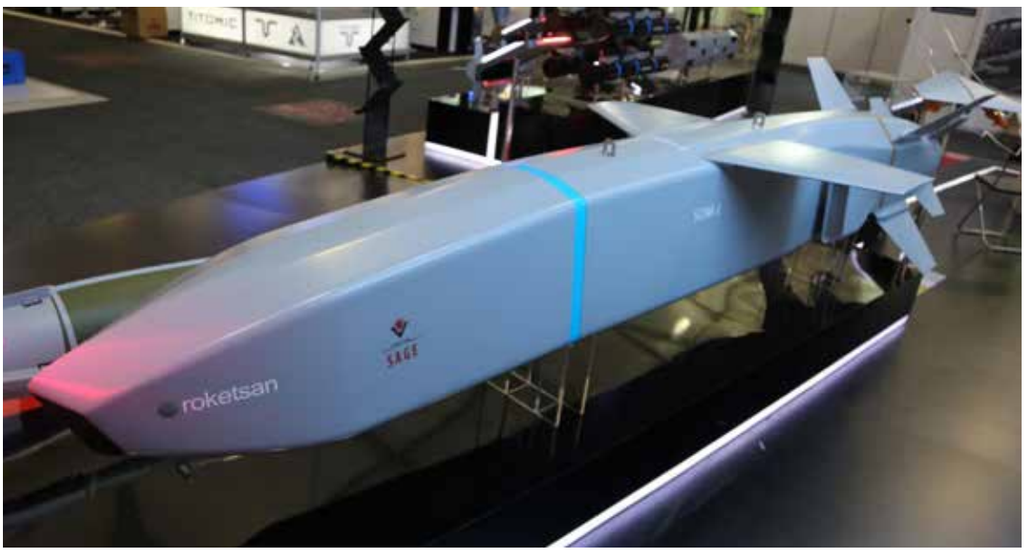
Gulfstream's representation at the 2017 Airshow is up from two aircraft at the 2015 event.

"With consistent growth over the past five years, we are pleased that our ongoing commitment to understanding and servicing the Asia Pacific market has delivered favourable business results," Gulfstream senior vice president for worldwide sales Scott Neal said.

"The three aircraft we'll have on display at Avalon exemplify the best in their class, providing the range, speed and payload necessary for the typical long-range flights characteristic of this region."

The 2016 Defence White Paper showed the Australia Government planned to acquire up to five modified Gulfstream G550s for surveillance and electronic warfare.

Australian Aviation's annual "bizjets directory", published in the December edition of the magazine, showed there were 15 Gulfstream aircraft based in Australia and New Zealand as at October 31 2016.



Turkey's Roketsan highlights SOM-J stand-off missile

Turkish defence company Roketsan is using its presence at Avalon 2017 to highlight its indigenously-developed SOM Stand-Off Missile, a variant of which is in development for the F-35 JSF.

The SOM is an autonomous, long-range (250km class), low-observable, all-weather, air-to-surface weapon which can be employed against stationary and moving land and naval targets, and is already in service on Turkish Air Force F-16s and upgraded F-4E Phantom fighters.

Roketsan is now developing the SOM-J for internal carriage on the F-35, having signed a cooperation agreement Lockheed Martin Missiles and Fire Control to jointly develop, market and support the new weapon.

Roketsan says SOM-J serial production is expected to begin in 2018 following the flight tests from F-16 Block 40s in the first quarter of 2017.

New Boeing Defence Australia MD appointed

Darren Edwards has been appointed Boeing Defence Australia's new vice president and managing director, succeeding Ken Shaw, who has taken up the position of vice president of supply chain for Boeing Global Services.

Edwards previously spent a decade with Boeing in Australia and the US, serving as chief operating officer of Boeing Defence Australia from 2011 to 2015, and rejoins the company from Salentis, where he was general manager for Australia and New Zealand.

"Darren's inclusive leadership style and broad knowledge of Boeing and the Australian Defence Force will be a great asset as Boeing Defence Australia continues to accelerate its growth," David Pitchforth, president of Boeing Global Operations, said in a statement on February 19.

Edwards will be based at Boeing Defence Australia's Brisbane head office. He will also sit on the Boeing Australia Holdings board and join the Boeing Australia leadership team under Boeing Australia, New Zealand and South Pacific president Maureen Dougherty.

"We are grateful to Ken Shaw for his dedicated service and outstanding leadership over the past 18 months," Pitchforth said.

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