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Demonstrating the remarkable advances in military aviation, a No 1 Squadron F/A-18F Super Hornet and a Bristol F2B Fighter (provided by TAVAS WWI Vintage Aircraft Society and flown by Jack McDonald) marked the centenary of the squadron's first operational sorties (12 June 1916). Painted in WWI-era 1SQN colours, the Bristol displays the tail number B1229, as flown by Ross McPherson Smith, who achieved 10 of his 11 victories in this aircraft. Photo: David White



A Defence Innovation Hub program



2016/17 **Rapid Prototyping, Development & Evaluation** Annual Report



Four ships have carried the proud name of *HMAS Parramatta*. Navy's first ship was built on the Parramatta River and served with distinction in WWI. The second *Parramatta* operated in the Red Sea and Mediterranean during World War II. It was torpedoed in 1941, with a loss of 138 lives. HMAS *Parramatta* III served with distinction during the Indonesia- Malaysia Confrontation. *Parramatta* IV is an ANZAC class frigate, currently in service with the RAN. Image: HMAS *Parramatta* III, circa 1960.

RAAF F/A-18A/B Hornet and P-8A Poseidon aircraft have conducted low level, fast flying operations over the Gulf of St Vincent in support of sea trials for the Hobart Class Destroyer, NUSHIP Hobart. These trials began the formal ship acceptance process in the lead up to delivery later this year. Photo: CPL Craig Barrett





AVM Mel Hupfeld, DSC

For its time, RPDE was quite radical. With a single-minded aim of finding the best possible outcomes for our warfighters, it engaged early with Australian Industry – often bringing direct competitors together. It respected each party's Intellectual Property; and with its shared goals, it ignored many commercial drivers that limit collaboration.

Since 2004, RPDE has continued to break new ground. As outlined in this report, there are ample reasons to be proud of this program and all it has achieved.

Establishment of the Hub within the Defence Industry Policy Division of the Strategic Policy & Intelligence Group is a significant change to Defence's approach to engaging with Australian Industry. RPDE has joined a portfolio of programs being integrated into the Hub. In no way does this move diminish RPDE's value to Defence and to Australian Industry. On the contrary: the expanded recognition of Industry as the ninth Fundamental Input to Capability will benefit greatly from the incorporation of RPDE's functions within the Hub.

This report describes the qualities of the program that we will work to not just maintain, but to enhance over the coming years. As Deputy Chair of RPDE's last Advisory Board, I'd like to thank the Chair, Ms Kate Louis, for her leadership, and GM RPDE, Mr Josh Polette, for his guidance and support; and I acknowledge the contributions of RPDE's current and past Board Members, staff and Members who have contributed to building its solid reputation for excellence.

30 November 2017

Chair's Statement

The Rapid Prototyping, Development and Evaluation (RPDE) program was the brainchild of Defence and Industry leaders who sought to respond quickly to evolving threats. Their approach involved accelerating capability development by providing project officers with contemporary decision support from Industry and Academia, and by rapidly developing prototypes faster to solve complex problems.

Over the past 12 months RPDE has helped Capability Managers address complex problems: One Task, 11 QuickLooks, three QuickAnswers and two LongLooks have been completed. Six Tasks and seven QuickLooks are in progress, and will move with RPDE's transition into the Defence Innovation Hub. The unique collaborative environment provided by RPDE, where Defence, Industry and Academia feel comfortable to share ideas and solve problems together, is at the heart of its success.

The makeup of the Board, which took effect on 1 July 2016, included:

Member	Sponsoring Organisation
Heidi Garth	BMT Design & Technology
Amanda Holt	SYPAQ Systems
Terry Martin	Queensland University of Technology
Boris Novak	Dexata
Graham Smith	Lockheed Martin Australia
Terry Stevenson	Raytheon Australia
Will Taylor	QinetiQ
Brad Yelland	BAE Systems Australia



*Mr Josh Polette,
General Manager RPDE*

The ADF's ongoing capability improvement program is well demonstrated by this example of two former RAAF maritime patrol aircraft, the AP-3C Orion and P-2 Lockheed Neptune, participating in a flypast during the T150 Townsville Defence Force Air Show. Photo CPL David Cotton

General Manager's Statement



Since its establishment in November 2004, the story of RPDE reflects the challenges and opportunities faced by all of Defence over that same timeframe. The ADF has confronted conflicts that drove the need to accelerate development and decision making at a rate not seen since WWII.

RPDE's role has not always been to find a solution. On some notable occasions, the outcome of its work has been to advise Capability Managers to not follow a particular path. Whatever the outcome of its work, it has presented its findings without fear or favour. Accordingly, this has earned RPDE the respect of Australian and International partners.

In preparing this report, RPDE interviewed former Defence chiefs, Industry leaders (including members of the Steering Group that established RPDE), past General Managers and Board Members, as well as APS staff and contractors who have contributed directly to its success.

Being part of RPDE's contribution to enhancing Australia's defence capabilities has been a highlight of my career. It is something I am proud to have shared with staff and Members of the Program. Being appointed to any position within RPDE is a privilege. There are few organisations in this country where people work with such a strong sense of purpose and cooperation.

This final Annual Report pays tribute to the many people who contributed to RPDE's success since its formation in 2004. This dedicated team of staff and Members has achieved great results in a truly collaborative environment.

It would be remiss of me if I did not acknowledge the retirement of Laurie Wiseman and John Chapuis. Laurie joined RPDE as Security Manager, a few months after it was established; and held that position until June of this year.

John Chapuis joined RPDE from a Member organisation to establish the QuickLook program in 2006. After being embedded in the Counter IED Task Force (CIEDTF) in 2006, where he played a major role in supporting RPDE's deep involvement in counter IED development, John joined the APS, holding the position of Commercial Manager from 2013. John is regarded as the corporate memory of RPDE and has provided me with invaluable support and guidance.

Finally, I would like to thank the thousands of ADF, APS, Industry and Academic staff who have contributed to the RPDE program in a spirit of true collaboration. I look forward to seeing this continue in the new Defence Innovation Hub.

Since World War II the RAAF has continuously operated maritime reconnaissance aircraft. To enhance Australia's surveillance and search & rescue capabilities, the P-8A Poseidon recently replaced the Orion.

*Mr Benjamin Hayes,
Assistant Secretary
Defence Industry Capability &
Innovation Branch (ASDCI) and
Chair of the One Star Steering Group*



The Future of Defence Innovation

A great deal has been achieved since the Government announced the creation of the Defence Innovation Hub in February 2016. The Hub officially opened for business in December 2017 and received more than 200 proposals in its first six months of operation.

Importantly, the Hub awarded its first three innovation contracts in June 2017.

The Defence Innovation Hub has listened carefully to RPDE's Board Members, management, staff and contractors as it works toward the integration of RPDE into the Hub. This expertise and advice will help us connect partners, streamline processes and accelerate the transfer of innovative technologies into advanced Defence capability.

In parallel with this, legacy programs such as RPDE have continued to deliver outcomes for Defence. It has been critical to the startup of the Hub that these programs have maintained their focus during this transition.

Bringing RPDE into the Hub does not diminish its value to Defence. On the contrary, it will expand its resources and integrate its activities with other programs to achieve even more positive outcomes for the warfighter.

RPDE has not only influenced investment decisions within Capability Development and other areas of Defence, it has also shown what can be achieved when we work more closely with Australian Industry and Academia.

I would like to thank the RPDE team, past and present, for their outstanding work and passionate commitment over many years.

Finally I would like to pay tribute to, and thank, Josh Polette for his leadership and counsel over the past year. Josh has been a terrific advocate and consummate professional through a complex and challenging transition, reflecting the values that RPDE has become known for over the past 13 years.



*Phuoc Tuy Province, South Vietnam, 1967.
Soldiers from Support Company, 7th Battalion,
Royal Australian Regiment (7RAR),
dodge the downdraft of an Iroquois helicopter
during Operation Santa Fe.*

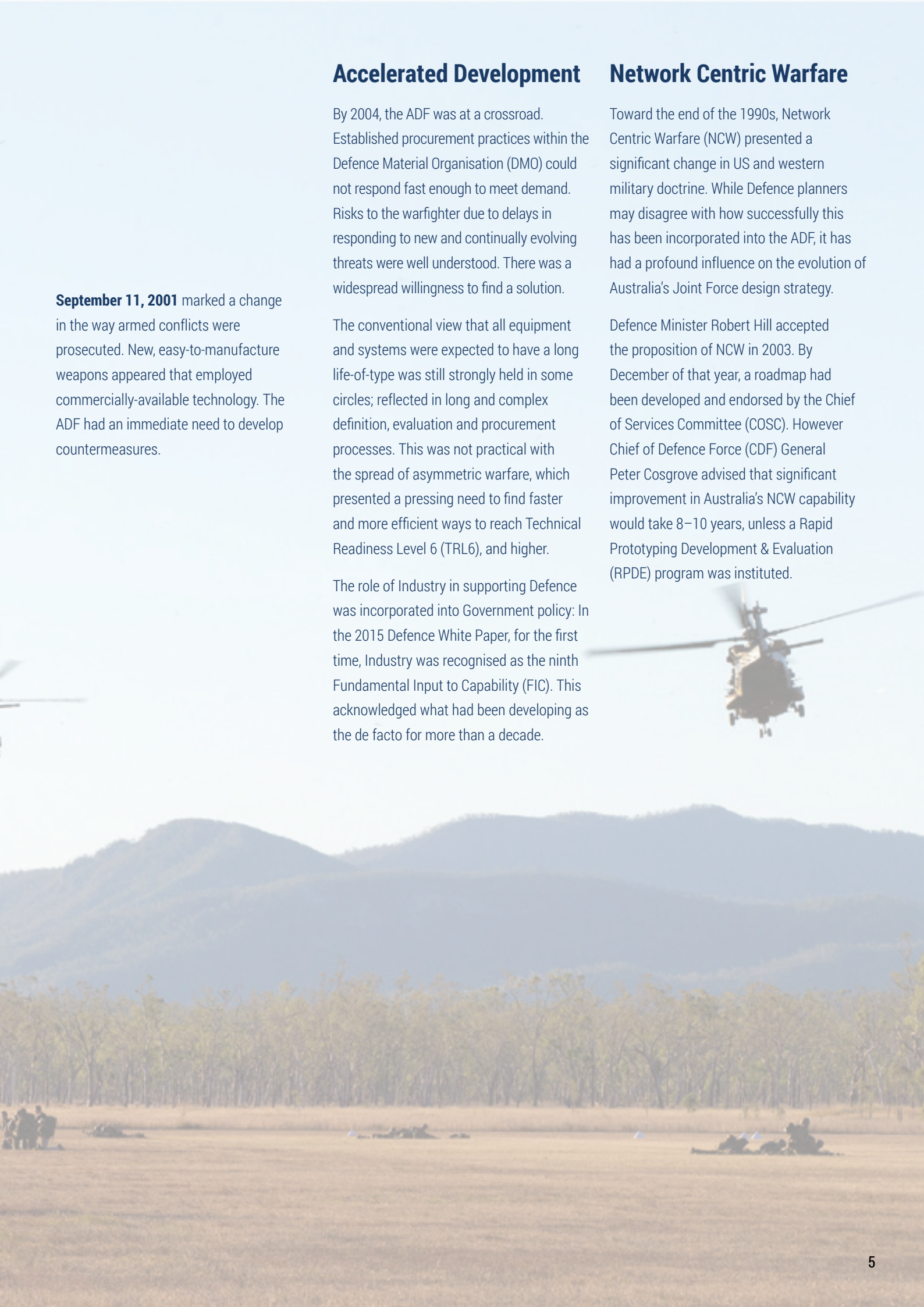


The Changing Face of the ADF



*MRH-90 multi-role helicopters depart the landing zone
during Exercise Blue Dog 2, after dropping off soldiers from
6th Battalion, Royal Australian Regiment, in Shoalwater Bay
training area, near Rockhampton, Queensland.*





September 11, 2001 marked a change in the way armed conflicts were prosecuted. New, easy-to-manufacture weapons appeared that employed commercially-available technology. The ADF had an immediate need to develop countermeasures.

Accelerated Development

By 2004, the ADF was at a crossroad. Established procurement practices within the Defence Material Organisation (DMO) could not respond fast enough to meet demand. Risks to the warfighter due to delays in responding to new and continually evolving threats were well understood. There was a widespread willingness to find a solution.

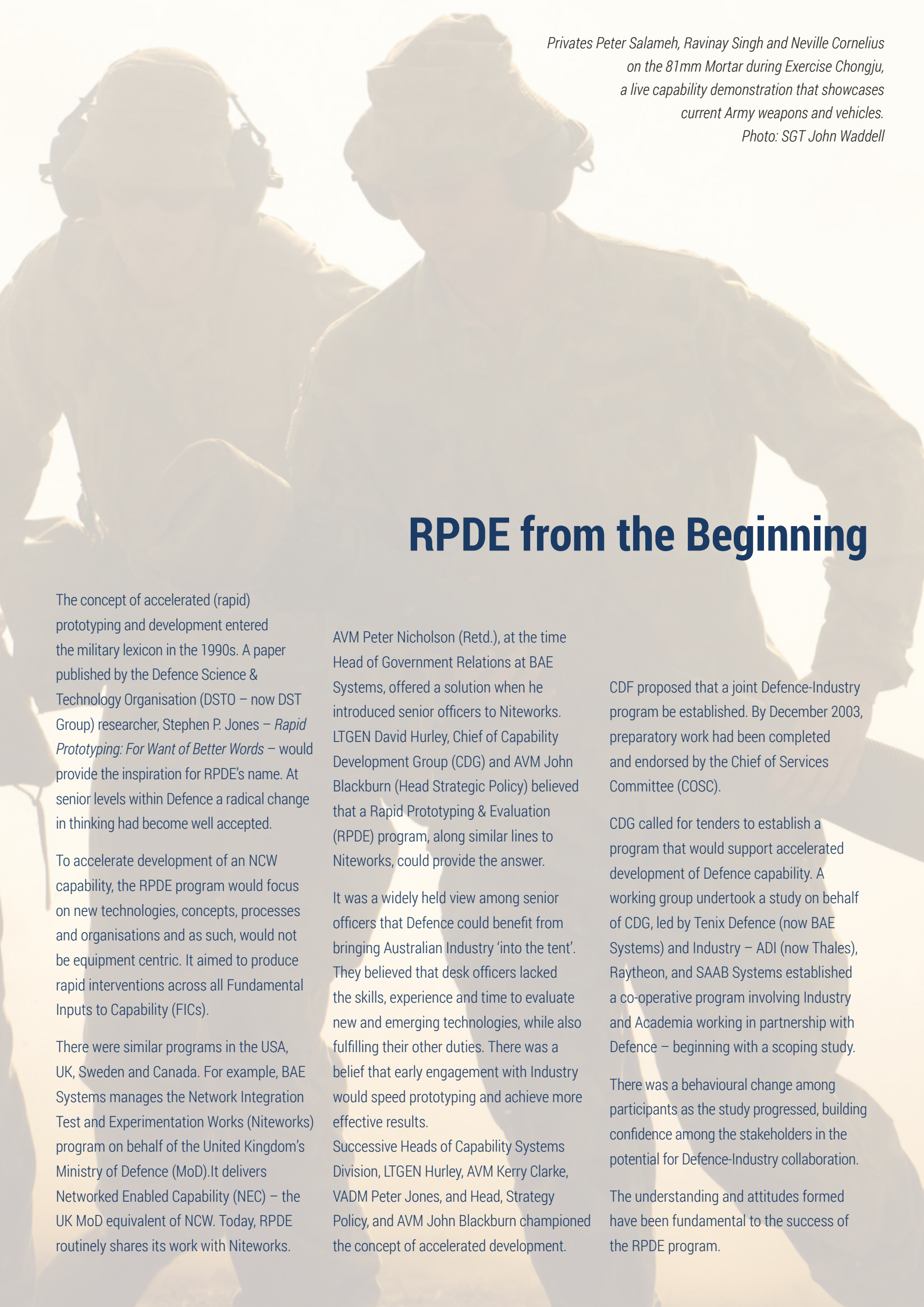
The conventional view that all equipment and systems were expected to have a long life-of-type was still strongly held in some circles; reflected in long and complex definition, evaluation and procurement processes. This was not practical with the spread of asymmetric warfare, which presented a pressing need to find faster and more efficient ways to reach Technical Readiness Level 6 (TRL6), and higher.

The role of Industry in supporting Defence was incorporated into Government policy: In the 2015 Defence White Paper, for the first time, Industry was recognised as the ninth Fundamental Input to Capability (FIC). This acknowledged what had been developing as the de facto for more than a decade.

Network Centric Warfare

Toward the end of the 1990s, Network Centric Warfare (NCW) presented a significant change in US and western military doctrine. While Defence planners may disagree with how successfully this has been incorporated into the ADF, it has had a profound influence on the evolution of Australia's Joint Force design strategy.

Defence Minister Robert Hill accepted the proposition of NCW in 2003. By December of that year, a roadmap had been developed and endorsed by the Chief of Services Committee (COSC). However Chief of Defence Force (CDF) General Peter Cosgrove advised that significant improvement in Australia's NCW capability would take 8–10 years, unless a Rapid Prototyping Development & Evaluation (RPDE) program was instituted.



*Privates Peter Salameh, Ravinay Singh and Neville Cornelius
on the 81mm Mortar during Exercise Chongju,
a live capability demonstration that showcases
current Army weapons and vehicles.
Photo: SGT John Waddell*

RPDE from the Beginning

The concept of accelerated (rapid) prototyping and development entered the military lexicon in the 1990s. A paper published by the Defence Science & Technology Organisation (DSTO – now DST Group) researcher, Stephen P. Jones – *Rapid Prototyping: For Want of Better Words* – would provide the inspiration for RPDE's name. At senior levels within Defence a radical change in thinking had become well accepted.

To accelerate development of an NCW capability, the RPDE program would focus on new technologies, concepts, processes and organisations and as such, would not be equipment centric. It aimed to produce rapid interventions across all Fundamental Inputs to Capability (FICs).

There were similar programs in the USA, UK, Sweden and Canada. For example, BAE Systems manages the Network Integration Test and Experimentation Works (Niteworks) program on behalf of the United Kingdom's Ministry of Defence (MoD). It delivers Networked Enabled Capability (NEC) – the UK MoD equivalent of NCW. Today, RPDE routinely shares its work with Niteworks.

AVM Peter Nicholson (Retd.), at the time Head of Government Relations at BAE Systems, offered a solution when he introduced senior officers to Niteworks. LTGEN David Hurley, Chief of Capability Development Group (CDG) and AVM John Blackburn (Head Strategic Policy) believed that a Rapid Prototyping & Evaluation (RPDE) program, along similar lines to Niteworks, could provide the answer.

It was a widely held view among senior officers that Defence could benefit from bringing Australian Industry 'into the tent'. They believed that desk officers lacked the skills, experience and time to evaluate new and emerging technologies, while also fulfilling their other duties. There was a belief that early engagement with Industry would speed prototyping and achieve more effective results.

Successive Heads of Capability Systems Division, LTGEN Hurley, AVM Kerry Clarke, VADM Peter Jones, and Head, Strategy Policy, and AVM John Blackburn championed the concept of accelerated development.

CDF proposed that a joint Defence-Industry program be established. By December 2003, preparatory work had been completed and endorsed by the Chief of Services Committee (COSC).

CDG called for tenders to establish a program that would support accelerated development of Defence capability. A working group undertook a study on behalf of CDG, led by Tenix Defence (now BAE Systems) and Industry – ADI (now Thales), Raytheon, and SAAB Systems established a co-operative program involving Industry and Academia working in partnership with Defence – beginning with a scoping study.

There was a behavioural change among participants as the study progressed, building confidence among the stakeholders in the potential for Defence-Industry collaboration.

The understanding and attitudes formed have been fundamental to the success of the RPDE program.

Australian forces watch a demonstration of the U.S. M20 3.5 inch rocket launcher (Bazooka).

At Chongju in late 1950, a bazooka team from 3 Platoon, A Company, 3rd Battalion, Royal Australian Regiment (3RAR) used the M20 to destroy three North Korean T-30 tanks.

*Photo: Phillip Oliver Hobson
Courtesy: Australian War Memorial*

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Many of the firms that joined early in RPDE's development have remained active Members throughout its operating life. For example, Innovation Science Ltd joined RPDE in July 2005. Its Managing Director, Michael Haddy, was elected to the Board in 2009, and again in 2011. He was appointed QL116 Lead in April 2015, Activity Manager from December 2015, and Acting Operations Manager from April 2017.

CDG controlled the program's phased implementation. RPDE initially comprised 10 core staff (two from Defence and eight from Industry). One of the founding APS staff, Mrs Laura Carroll continues to manage its finances and will join the Defence Innovation Hub.

The successful resolution of Intellectual Property (IP) issues is considered to be key to the success of the RPDE Program. The in-principle agreement reached during the scoping study was developed further in the Establishment Phase. Participant rights and obligations are fully detailed in a multi-party deed – the Relationship Agreement (RA). From the beginning, it was determined that the program would not proceed unless the parties agreed to the arrangements for sharing IP.

The RA has long been seen as one of the great achievements of the Program.

The Defence Materiel Organisation (DMO) played an essential role in developing the operating principles on which RPDE was established. Head Electronic & Weapon Systems Division, Ms Shireane McKinnie, appointed Mr Mark Reynolds, Director General Electronic Systems Integration, as lead negotiator for DMO. Drawing on the knowledge and experience of Ms Thea Huber, who was principle architect of the RA and Standing Offer, DMO provided contractual and technical support as RPDE took its first steps.

Governance

Defence owned and led the RPDE Program with governance at two levels. The Defence Capability and Investment Committee (DCIC) approved CCDG to direct RPDE tasking, funding and reporting. In addition, a new joint Defence-Industry Board was established. HCS chaired the Board, with Industry representatives at the Group General Manager level.

A joint Defence and Industry team would leverage the combination of operational military experience with the ability of Industry to rapidly exploit NCW-related technology. Reflecting the disparate nature of Defence Industry at the time, participation was established at two levels: Partners (Defence Prime Contractors), and Associates (others companies and Academia). This was changed to a single-tier membership in 2016.

Initially, Industry was represented by the five scoping study participants. A few months after RPDE was established, Australian companies were invited to participate. A second invitation to participate followed six months later. This was repeated periodically.



A Maribyrnong, Victoria factory worker tests gas masks circa October 1940. RPDE is working with CSIRO to achieve major advances in gas mask design. Photo: Edward 'Ted' Cranstone

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Australian Industry Participation

Participation was dependent on companies meeting the same criteria. Advantages to Industry include:

- The opportunity to influence Defence through the RPDE Board and collaborative forums. Participation enables Members to make better investment decisions.
- Greater visibility of programs under consideration by Defence and a better understanding of its strategic processes.
- Members share access to foreground IP.
- Industry can receive a commercial return on the people, technologies and assets it provides; as well as improved business planning information, and greater support to international sales and marketing.
- The RPDE Program through its collaborative approach makes it easier for SMEs to conduct business with Defence.

Growth in RPDE

Through its Standing Offer, Defence engaged directly with participating companies. The RPDE organisation, authority, governance, staffing, rights, obligations and behaviours of the alliance are conditions of the contract. In effect, the Commonwealth is the lead contractor to remove the potential or perceived bias of an industry lead.

The Multi-party Deed deals with issues where all participating parties seek obligations on all others, such as IP.

RPDE Leadership

John Glenn from Tenix served as interim General Manager until Mike Kalms was appointed RPDE's first General Manager. He was followed by Pam Price, BRIG David Welch, Heather Layton, Rick Shalders and Josh Polette.

The active support of successive Heads of Capability Development Group (CDG) are seen as being vital to its success. They include: LTGEN David Hurley, VADM Matt Tripovich, AM John Harvey, VADM Peter Jones, LTGEN John Caligari and AVN Mel Hupfeld. FASDIP Kate Louis assumed the role of Chair of the Board in July 2016.

Australian Army soldiers conduct pre-fatigue drills during CBRN (Chemical, Biological, Radiological and Nuclear) training, at Kokoda Barracks, Canungra, Queensland. Photo: CPL Jake Sims

Comment from some of RPDE's Founders

The establishment of the RPDE program is not the result of one set of ideas or actions. After interviewing Defence and Industry stakeholders, there appears to have been several lines of thinking at the time that inspired its creation; and throughout its life, it continued to respond to changes within the Defence environment.

Australian Defence Industry leaders actively supported the establishment of RPDE. The Industry Steering Group included representatives of ADI, BAE Systems, Raytheon, SAAB and Tenix.

The key drivers for its establishment included the need to:

- *accelerate the transition from a Service Centric to a Network Centric Warfare capability*
- *respond faster to counter IEDs and other rapidly evolving threats*
- *reduce project risk by giving desk officers more contemporary information and advice*
- *faster prototype development.*

Bringing Australian Industry together under the Relationship Agreement in a collaborative environment is regarded as an outcome of inestimable value. This pre-dated the concept of Defence Industry being a Fundamental Input to Industry (FIC) by 10 years.

Interviews have drawn some clear conclusions about the value of Defence's closer involvement with Industry through RPDE's formation.

Among the people interviewed, the consistent message was that the program could never achieve 100% success. AVM Clarke warned that process is the enemy of innovation. 'Of course RPDE delivered value for money. Was it always faster? No. Would I do it again? Yes!'

AVM Blackburn recalled a conversation with US Director of Force Transformation, Vice Admiral Cebrowski. 'He expressed the view that there is no guarantee when Defence invests in innovation. If 40% of it happens, it will be a success. The risk is not in undertaking innovation. The risk is failing to.'

The consistent message from interviewees is that RPDE, like Defence, has evolved with changes of government and Defence policy and direction. It has achieved this while consistently delivering value for money.

About RPDE

RPDE was established in 2005 to bring Defence and Industry together in a collaborative environment that could deliver innovative solutions addressing complex Defence capability development and modernisation issues.

Our Mission

RPDE's mission is to accelerate and enhance Australian Defence Force (ADF) warfighting capability through innovation and collaboration.

What we do

RPDE activities are projects funded by Defence and staffed by personnel from Industry and Academia. Each project activity has a One Star Defence sponsor.

There are four types of activities: Tasks, QuickLooks, QuickAnswers, and LongLooks.

Tasks facilitate change and can include the introduction of new concepts and/or technologies. Solutions can include architectures, prototypes or proofs of concept, and would normally include consideration of critical Fundamental Inputs to Capability elements.

QuickLooks provide options and recommendations to address complex Defence issues by bringing together experts from Industry and Academia.

QuickAnswers respond to urgent or simple needs from Defence that require Industry input to inform, shape, guide or solve issues.

LongLooks engage the services of key academics, noted for being Australian and/or international leaders in areas of research that align to ADF capability.

The intellectual property generated by RPDE activities is owned by the Commonwealth of Australia and is available to its Members.

Governance

The Advisory Board ensured that RPDE kept to its mission and focused on the challenges prioritised by Defence. Its committees included: Strategy, Business Development and Stakeholder Engagement/Communications, and Membership.

Operating along similar lines to a corporate board, its role has been to review RPDE's operations, with a focus on strategy. Over the last year, the Board has helped to steer RPDE in its transition into the Defence Innovation Hub. The final Board meeting, Chaired by First Assistant Secretary Defence Industry Policy (FASDIP) Division, was held in May 2017.

Being part of the Defence Innovation Hub, RPDE's governance is now performed by the **Innovation Steering Group**, co-chaired by FASDIP and Chief Strategic Science and Program Division, DST Group. Its representation includes two-star Defence executives, as well as Industry & Academic positions appointed by the Minister for Defence Industry.

The Steering Group provides advice to the Innovation Hub on investment priorities and technology fore-sighting. It will set the detailed investment parameters for use by the Innovation Hub and the **Hub Investment Advisory Group**, including:

- balance of investment across capability streams
- mix of investment across innovation phases
- the weighting of assessment criteria used by the Innovation Hub.

On a quarterly basis, the Steering Group will review the performance of innovation programs and the portfolio of innovation investment, including the balance of investment.

RPDE Board Members and observers:

(rear) Boris Novak, Peter Kerr (DST Group), Will Taylor, RADM Tony Dalton (HJSD), Terry Stevenson, Benjamin Hayes (ASDCI), Amanda Holt

(front) Josh Polette (GM RPDE),

AVM Mel Hupfeld (HFD, Vice-Chair),

Kate Louis (FASDIP, Chair),

Mat Franklin (CIOG) and Graham Smith

Photo: Grace Costa Banson

Resigned: Heidi Garth

Absent: Brad Yelland and Terrence Martin

Program Oversight

Until March this year, RPDE activities were overseen by a **One Star Steering Group** (1SSG), Chaired by the Assistant Secretary Capability and Innovation (ASDCI) Branch. Its 16 members, drawn from the Australian Defence Organisation and the New Zealand Defence Force, met every two months. The Group's role was to ensure activities met Defence priorities. It gave Commonwealth input into the RPDE Program to inform the priorities and funding decisions.

The 1SSG was represented by RPDE's customer base – from a range of Defence organisations and stakeholders, including:

- Capability Managers
- Headquarters Joint Operations Command
- Joint Logistics Command
- Defence Estate & Infrastructure Group
- Capability Acquisition & Sustainment Group
- Defence Science and Technology Group
- Counter Improvised Threat Task Force
- New Zealand's Capability Branch.

This ensured RPDE activities were considered from a Joint perspective; and that opportunities to deliver integrated and effective combined outcomes for Defence were addressed.



In March the Hub Investment Advisory Group (HIAG), also chaired by ASDCI, subsumed the 1SSG. It is represented by:

- DG Navy Plans, Systems & Infrastructure
- DG Modernisation & Land 400
- DG Modernisation – Air Force
- DG Force Options & Plans
- DG Capability Integration Test & Evaluation
- Program Leader – Innovation
- AS Critical Systems Branch
- DG Business Relations
- Australian Signals Directorate

The HIAG is responsible for:

- reviewing the Innovation Hub portfolio of investment to ensure alignment with strategic priorities and investment parameters set by the Innovation Steering Group
- reviewing assessed innovation proposals and making recommendations for investment
- reviewing recommendations for next phase funding for the continuation of existing projects
- ensuring project sponsors and other stakeholders provide appropriate support to innovation project management.

The RPDE Team

RPDE's very capable administration and commercial APS staff – all permanent APS employees – support an ever-changing team of Industry and Academic staff.

The Core team comes from our Member organisations, typically staying for two years.

Project teams stay for the period of their projects. Consequently, there is a continual turnover that is both a strength and a challenge. Fresh faces bring new ideas and new ways to solve the many complex assignments that Defence sets us.

Accumulated wisdom is not lost, as ideas and experiences are shared in a remarkably collegiate work environment. This is part of what has made RPDE such a success.

Value for Money

Since 2004, more than 750 people from RPDE's Member organisations, plus APS personnel and ADF servicemen and women have contributed to its success, completing 63 Tasks, 145 QuickLooks, 15 QuickAnswers and two LongLooks.

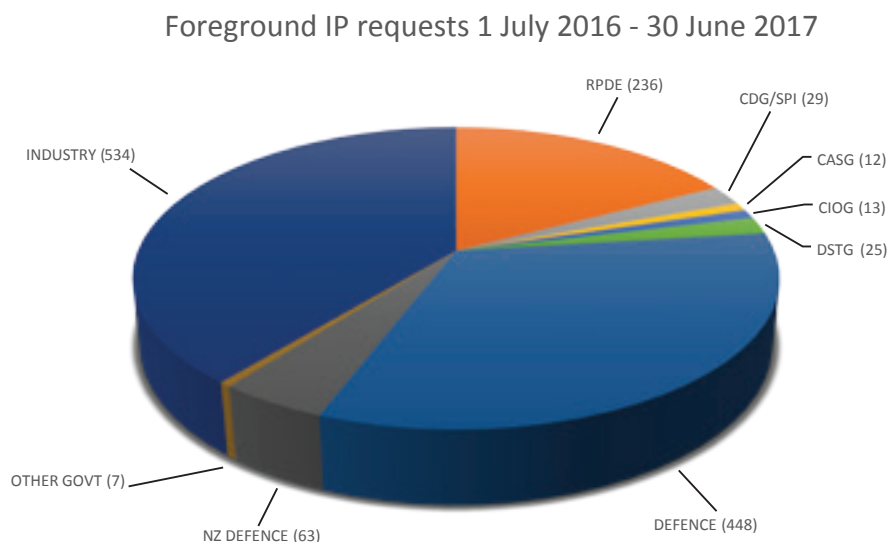
Based on the lowest value of each project budget range in the former Defence Capability Plan (DCP), RPDE has contributed to more than \$73 billion of Defence projects. The operating cost of RPDE since 2004 is around \$139 million. This cost represents around 0.2% of the total DCP value of projects. The real percentage is likely to be significantly lower.

The RPDE program has generated 732 items of Foreground Intellectual Property. This IP is used by Defence to understand and solve complex problems, and by RPDE's Member organisations to inform and drive development. This has generated more than 5,000 separate requests for access from Defence and Members, as well as international partners in the UK and NZ Governments.

Foreground IP Requests

The number of requests for access to Foreground Intellectual Property (IP) by Defence, Government Departments and Industry provides a meaningful indicator of the benefits the RPDE program delivers.

There was a total of 1367 requests over the reporting period. This includes 833 from Defence and other Government Departments, and 534 from Industry. A breakdown of IP Requests is shown below.



Bi-Annual Meeting of Participants

RPDE's Bi-Annual Meeting of Participants (BMP) has been an essential forum for Defence to discuss key issues with our Members, and to increase their understanding of the Defence environment. RPDE held its final BMP in November 2016. The meeting was attended by more than 100 Members and invited Defence staff. Presenters from the Defence community:

- MAJ GEN Gus McLachlan, Head Modernisation Strategic Plans – Army outlined Army's experience and the benefits of working with RPDE.
- Ms Kate Louis, First Assistant Secretary Defence Industry Policy Division provided an update on the plans for transitioning RPDE into the Defence Innovation Hub.

RPDE's Biannual Meeting of Participants has been replaced by the Defence Innovation Hub Industry Update, with the first held at ADFA on 23 June. This all-day open event was attended by Defence personnel, Industry and Academia.

Defence Review of Relationship Agreement

In April 2017, as part of the transition of RPDE into the Defence Innovation Hub, Defence commenced a due diligence review of the Relationship Agreement and Standing Offer. A preliminary finding of the review identified some issues that required further examination. As a result, RPDE suspended the issuing of new or modified Service Contracts in April 2017.

The suspension had some operational impacts on the RPDE program while alternative methods of engaging Industry and Academia were identified. The primary impact was on RPDE's ability to engage personnel under the terms of the Relationship Agreement for workshops and to commence new activities. At the time of writing the Annual Report the review was still being finalised and the suspension remained in place.

Acknowledgements

RPDE gratefully acknowledges the contributions of the following people who provided their time and their insights for the production of this report:

AM John Blackburn (Ret'd)
Laura Carroll
John Chapuis
AVM Kerry Clarke (Ret'd)
Colin Cooper
Michael Haddy
AM John Harvey (Ret'd)
Thea Huber
AVM Mel Hupfeld
His Excellency, General,
The Honourable David Hurley AC DSC (Ret'd)
Governor of New South Wales
VADM Peter Jones (Ret'd)
Mike Kalms
Heather Layton
Shireane McKinnie
AVM Peter Nicholson (Ret'd)
Brice Pacey
Josh Polette
Pam Price
GPCAPT Mark Reynolds
Rick Shalders
Alan Titheridge
VADM Matt Tripovich (Ret'd)
BRIG David Welch (Ret'd)
Laurie Wiseman

RPDE Membership as at 30 June 2017

AAM Group	Dimension Data Australia	Melix	Unmanned Systems Australia
ABB Enterprise Software	Dioli	Microsecure Corporation	Varley
Acacia Research	Ebor Computing	Microsoft	Fenix Consulting Services
Accenture Australia Holdings	Ecastle	MilitaryTech	VIPAC Engineers & Scientists
Acoustic Force	EcoThought	Milskil	WDScoot
Adelaide Research & Innovation (acting for The University of Adelaide)	Edith Cowan University	Minelab Electronics	XTEK
Agent Oriented Software	Eggler Consulting Engineers	National ICT Australia	YTEK
Airbus Group Australia	Elbit Systems of Australia	Northrop Grumman Australia	Explosive Protective Equipment
Airspeed	EM Solutions	Nova Defence	ZBOB Engineering
AMW Professional Services	EMC Solar Construction	Noventus	Zone Advanced Protection Systems
archTIS	Enginium	Oakton	New Zealand Defence Force
Artis Group	Entech Electronics	Ocean Software	Strategenics
ASC	Envista	Optus Networks	Tech Knowledges trading as AnitCom
ASG Group	Ernst & Young	Orbital8	University of Sydney
Associated Electronic Services	ESRI-Australia	Orion Integration	SoftWire Systems
Atamo	Essys	Pacific Aerospace Consulting	SimCentric Technologies
Atos (Australia)	Etherstack	Panther Games	Semantic Sciences Research
ATSA Defence Services	Harris C4i	Partech Systems	Selex ES Australia
Audio Visual Imagenation (AVI)	Fastwave Communications	Penske Power Systems	AgustaWestland Australia
Aurecon Australia	Fiomarine Industries	PricewaterhouseCoopers	Norship Marine
Austral Ships	Flight Data Systems	Project Outcomes	RaptorSSC
Australian National University (ANU)	Forgacs-Broens	QinetiQ	Criterion Solutions
AVAXA	Frazer-Nash Consultancy	Queensland University of Technology	Omni Executive
Babcock	Fujitsu Australia New Zealand (FANZ)	Quickstrike Defence and Aerospace	Micreo
BAE Systems Applied Intelligence	Functional Directions	Raytheon Australia	Trang Imagineering
BAE Systems Australia	General Dynamics Land Systems Division	Relegen	Kul Technologies
Beca Consultants (Australia)	Geoplex	Rheinmetall Simulation Australia (RSA)	Klepper
Bellinger Instruments	Geospatial Intelligence (Solutions)	Rockwell Collins Australia	Wilson Hammond Group
Benelec	GHD	RPC Technologies	GIS People
Berkeley Information Technology	Grey Innovation	Rutledge Engineering (Aust)	FREQUENTIS Australasia
Blue Glue	H. I. FraserMarina Zarnitsyna	Saab Australia	elmTEK
BMT Design and Technology	Hawker Pacific	Security Centric	Det Norske Veritas
Boeing Defence Australia	Holocentric	Sentient Vision Systems	Brennan Advisory
CAE Australia	Hydrix Services	Shoal Engineering	BCT Solutions
Calytrix Technologies	IBM Australia	Signal Processing Know-how	Textron Systems Australia
Capgemini Australia	IDES	Simbiant	Sea Box International
Capstoneblack	ImmersaView	Simplicity Communications	aadi Defence
CEA Technologies	InDepth Project Management	Sofraco Engineering Systems	QUARTEK
Charles Darwin University	Innovation Science	Solve Group	Jayrow Systems
Chemring Australia	Inovor Technologies	Sonartech Atlas	Gasco
Cirrus Real Time Processing Systems	International Seal Company Australia	SouthTech Systems	LBE Technology
Clarinox Technologies	Jacobs Australia	SPYRUS	VIZIONX
Clearbox Systems	Jenkins Engineering Defence Systems	SRA Information Technology	Scratch Systems
Cobham Aviations Services Australia	Kellogg Brown & Root	Strategic Engineering	Frogtech
Codarra Advanced Systems	Keystone Private	Supacat	QAL Technologies
Cogent Business Solutions	KoBold Group	SYPAQ Systems	DEWC
CSIRO	KPMG	SystemWare-Pacific	Gulanga Group
Communications Design & Management	L-3 Communications Australia	Tactical Research	Kallista Consulting
Connexion	L-3 Communications Oceania	TASKey	ISCM - Australia
Consilium Technology	Lange Consulting	Tectonica Australia	Abacus Innovations Australia
Consunet	Leadership Solutions Australia	Telstra Corporation	Context Information Security
CSC Australia	Learning Systems Analysis	Thacient Software	Calibre Defence
Cubic Defence Australia	LISAsoft	Thales Australia	Seeing Machines
Daronmont Technologies	Locata Corporation	The Frame Group	Kordia Solutions
Deakin University	Lockheed Martin Australia	The Simulation Group	Silvertone Electronics
Defence Communications Industry	– Electronic Systems	The University of Newcastle	BMT WBM
DEK Corporation	Lockheed Martin Australia	Thyssenkrupp Marine Systems Australia	Systra Scott Lister Australia
Deloitte Touche Tohmatsu	Madry Technologies	UGL Engineering	Rhino Software (Conryclan Trust)
Dexata	mbits	Ultra Electronics Avalon Systems	Aerosafe Risk Management
Dialog	McGrathNicol and Partners	University of New South Wales (ADFA)	
	Mediaware International	University of Wollongong	

Activity Report

Work In Progress as at 30 June 2017: Six Tasks and seven QuickLooks

Number	Title	The Question
QL137	Amphibious Warfare	What are the ADF Amphibious Warfare gaps, risks, issues and opportunities and what options does Industry consider might address them?
QL140	Air Force Network Battlelab Concept	What options could deliver a Cyberspace Network Battlelab capability to meet Air Force's requirements and what role might Industry play in establishing and sustaining that capability?
QL141	Force Design Method Review - Best Practice	What methods that support 'complex evidence based decision-making' for capability and force structure investment options could be adopted by VCDF Group to support the Force Design Cycle?
QL142	SEA2400 Hydrographic Survey	What Defence/Industry partnership model(s) could meet the Defence obligation to deliver Australian hydrographic services?
QL143	Enhanced HF Comms Follow-On	TBD by Activity to socialize, clarify and validate the JP9101 OCD and FPS.
QL144	L8140 Deployed Force Infrastructure	How might Defence best deliver and sustain the broad options available to address the L8140 Joint Capability Needs?
QL145	Land125-4 Integrated Soldier Combat System	How might Industry support Army to better maintain strong relationships with Industry partners, exploit new technology and methods, and manage changes to the SCS and what role does Industry play in shaping the ASSA and adopting its principles?
T047	JP2048 Phase 4AB - Command and Control System	What is the optimal system level architecture to allow the CJTF, CATF and CLF to perform command and control from the JOR in the amphibious environment by 2017?
T054	CIED Hand Held Detection	Can a single IED Hand Held Device Detector (HHDD) be developed with hybrid detection capability while retiring currently identified deficiencies and reducing the form factor to (or below) the lightest and most compact ground search devices available?
T059	Land 17-1C.2 Ammunition Storage, Handling and Distribution	Does a solution exist for the carriage and loading of artillery ammunition (unit load ammunition carrier) through the logistics supply system from OEM to end user, including integration with various elements of the system such as transport, warehousing and transfer points?
T060	Tactical Mesh Network	Can UWB Ranging Radio provide communications as an enabler to provide situational understanding in complex environments?
T062	Broad Spectrum CBRN Respiratory Filter Canister (BSRC)	Can a single CBR respirator canister be developed that maintains the current Biological and Radiological (BR) capability while providing enhanced protection against high risk Chemical Threat Agents (CTA) for ADF operational scenarios?
T063	Army Deployable Power and Water	What are the ADF's options for deployable electrical power systems to support vehicles and field power requirements? What are the ADF's options for deployable water systems to support bulk and individual requirements? What exemplar technology options should be included in the solution development phase?

Work completed FY 2016/2017: One Task, 11 QuickLooks, three QuickAnswers and two LongLooks

Number	Title	The Question
LL001	Emerging Materials Technologies for Force Protection Applications	What will be the developments in manufacturing and material technologies that can be applied to lightweight force-protection applications in the next 2–5 years? What will be the challenges for the ADF to take advantage of these advances?
LL002	Battlespace Awareness	Provide an independent assessment of the changes that are occurring in the underlying technology and technical operating environment for two selected Battlespace Awareness domains: Radar and Electronic Support, with Electronic Support narrowing in on detection and tactical analysis of adversary radars and the detection and perhaps identification of digital communication devices.
QA009	Defence Innovation Ecosystem	How can Defence implement new and effective innovation realisation pathways to ensure a healthy Defence Innovation Ecosystem?
QA014	Long Range Fires	What currently available systems or emerging technologies could meet Army's need to deliver long range fires by the mid 2020s?
QA015	Standoff Handheld PBIED Detection Technology Refresh	What current or emerging technology options could provide the ADF with a Standoff, Handheld, Person-Borne Improvised Explosive Device Detection System capability within the next 2–3 years?
QL128	Federated Systems Integration Laboratories	What are the potential benefits to Defence if it were to establish a federated SIL engineering environment and how might it be established?
QL129	Defence Health JP2060-4 Validation	What are the likely high level requirements for JP2060 - 4 and what option or combination of options might provide an integrated deployable health capability, inclusive of an end-to-end common Electronic? Health Record (HER) from point of injury through to health support within the National Support Base?
QL130	Land 129 UAV PH4 Validation	How could the ADF acquire, maintain and update a SUAS fleet to deliver and sustain a viable SUAS capability over the Life Of Type (LOT) and provide a greater opportunity for Australian Industry involvement?
QL131	Ship Zero Concept	Are there any key FIC considerations that could affect Navy's intent to establish a Ship Zero for SEA1180-1 and SEA5000-1?
QL132	Test Documentation Better Practice	What is industry best practice for T&E documents, can any 'good ideas' be used for a revamp of Defence's Test Concept Document (TCD)/Early Test Plan (ETP) to better align with the new CLC process?
QL133	Army Aviation Information Exchange Requirements	What are the Information Exchange Requirements (IER) for Army Aviation platforms to meet the needs of Aircrew, Command and Control and Passengers?
QL134	JP9101 Enhanced High Frequency Communication System	What technology options might satisfy the future ADF High Frequency bearer
QL135	Future Camouflage and Concealment	What new approaches and emerging technologies could Army consider within the scope of future phases of major projects to avoid the detection or targeting of major ADF platforms, organisations and installations?
QL136	Deployable Infrastructure System	How might the ADF describe the deployable infrastructure system, and its interfaces and dependencies across the sub-systems and components - and what does Industry consider critical to the management, use and evolution of this system definition?
QL138	ADF TS Network Requirements	What are the most expedient and effective options for addressing the ADF's emerging requirement for a TS operational network that can support new platforms?
QL139	Counter CBNRE	What technology options and solutions are available or in development that could realise new ways to effectively enable, find, analyse, neutralise, exploit, and restore against CBRNE materials and their precursors?
T051	Handheld Standoff PBIED Detection	Can standoff IED detection technology be miniaturised and a concept demonstrator developed to enhance personal force protection for soldiers from IEDs?

Supporting the Warfighter – RPDE Activities undertaken between 2005 and 2017:

LongLooks		QuickLooks (Contd.)	
LL001	Emerging Materials Technologies for Force Protection Applications	QL039	Review of the Content/Form of the Public DCP 2009-19
LL002	Battlespace Awareness	QL040	Development of the NCW Roadmap 2009 - Industry Perspective
QuickAnswers		QL041	Joint Decision Support Centre Decision Record and Analysis Tools
QA 001	Combat Shooting/Combined Arms Ranges and Simulation	QL042	System Integration Performance Monitoring
QA 002	RPDE Task 005 Review – Joint Force Design	QL043	Explosive Ordnance Data Logger
QA 003	Measuring Army Performance	QL044	Simulation Support for EOD Training
QA 004	ICT Help Desk for ADO members with Hearing Loss	QL045	Forward Operating Base Surveillance
QA 005	CDG Project Documentation Suite Development Assurance	QL046	ADF Electronic Warfare Industry Engagement Requirements
QA 006	TRL6 to TRL 8 Framework	QL047	Cryptographic Equipment Maintenance Process and Tools Review
QA007	Land125-4 Soldier Combat System Risk Mitigation	QL048	Defence Export Unit Review
QA 008	New Capability Life Cycle Industry Support	QL049	SEA 1442 Ph4 High Rate Line of Sight Networks
QA009	Defence Innovation Ecosystem	QL050	JP2047 Ph 3 Wireless LAN Capability Options
QA010	Benefits Capture	QL051	Battlespace Architecture Think Piece
QA011	Plan Jericho Knowledge Management	QL052	Submarine HDR SATCOM
QA 012	Land 125-4 Gate Zero, Integrated Soldier Combat System	QL053	Special Forces Night Vision Capability Enhancement
QA013	Counter Unmanned Aerial Systems	QL054	JTAC Simulation Support to Training
QA014	Long Range Fires	QL055	CIOG Integrated Defence Architecture Layer
QA015	Standoff Handheld PBIED Detection Technology Refresh	QL056	Workshop Support to JP2072
QA016	SEA1442-5 Maritime Communications Modernisation – Literature Search	QL057	Collins Class Submarine LAN Networks
QuickLooks		QL058	Defence Export Unit Review
QL001	SEA 1439 Ph6 Sonar - Collins Submarine	QL059	Sea 1180 Offshore Combatant Vessel
QL002	JP2008 Ph4 - Review of the MILSATCOM acquisition project	QL060	Joint Design Framework for SEA1000 Phase 1
QL003	Counter Improvised Explosive Device Task Force	QL061	Wireless LAN Capability Options
QL004	Cancelled	QL062	Systems of Systems Integration
QL005	SEA 1439 Ph5B Collins Continuous Improvement Program	QL063	Simulation Support to L4000
QL006	Considerations for a Canberra Based Simulation Centre	QL064	JP2072 Phase 2B: Options for Security Design and Development
QL007	Cancelled	QL065	Air Sea Rescue Kit
QL008	JP2077 Part 1	QL066	Joint Health Management of Class 8 Pharmaceuticals
QL009	Air Force Headquarters Strategic Tools	QL067	Virtual Training Aids for RAAF School of Technical Training
QL010	Cancelled	QL068	Defence Cross Domain eBusiness Integration Infrastructure (X-DeBi)
QL011	Initial Capability Development Statement – Non-lethal Weapons	QL069	Hyperspectral Imaging
QL012	Cancelled	QL070	Combined Arms Fighting System Integration Capability
QL013	Aerospace Management UAS	QL071	AIR5077 Phase 4 Wedgetail Accelerated Upgrade Study
QL014	Joint Force Protection Land & Sea	QL072	Software Defined Radio Development and Support
QL015	ICDS 2 Base Security	QL073	Multi-Security Air Traffic Management
QL016	Replacement Hydrographic and Mine Counter Measures Vessels ICDS	QL074	Acoustic Cloaking
QL017	Automatic Dependant Surveillance - Broadcast	QL075	FOB Energy Sources
QL018	Air Traffic Control Voice for Vigilaire	QL076	Detecting Underground Anomalies
QL019	Capability Development Process Enhancements – Short Life Cycle Capabilities	QL077	Offshore Combatant Vessel Modular Concept
QL020	ADF Fixed Wing & Rotary Wing Aircrew Training	QL078	Industry's through-life Support of the Future Combined Arms Fighting System
QL021	ADF Joint Fires Training System	QL079	Management of Joint Test and Evaluation
QL022	Planning and Scheduling Tools to support the ISR Environment	QL080	Data Labelling and Metadata Tagging in a SOA Environment
QL023	ADF Electronic Warfare Capability Development	QL081	Interference Barrier/Electronic Support System Remediation Investigation
QL024	Identity Management	QL082	Enterprise Portfolio/Programme Management Systems Analysis Support
QL025	JP2047 Phase 3 Defence Wide Area Communications Network	QL083	Rizzo Reform Program - Navy Engineering Workforce Planning
QL026	Priority Local Industry Capability	QL084	AIR87 Phase 3 Capability Assurance Program Study
QL027	Electronic Flight Bags for ADF Airborne Platforms	QL085	Agile Manufacturing
QL028	Intellectual Property Protection	QL086	Support to Future Navy EW Systems
QL029	Non-Lethal Attention Gaining Devices	QL087	JP154 Phase 2 - Force Protection ECM Technology Refresh
QL030	Armed Reconnaissance Helicopter Data Link	QL088	Intelligence Mission Data
QL031	Simulation Cost of Ownership	QL089	AIR 7000 Phase 1B – Small Mixed Fleet for Multi-mission UAS
QL032	Australian Customs Service - Replacement Customs Vessels	QL090	LAND 19 Phase 7A Counter – Rocket, Artillery & Mortar Intro. to Service
QL033	Tactical Common Data Link	QL091	LAND 121 Phase 4/LAND 400 - Common Vehicle Architecture
QL034	Collaboration Planning	QL092	Project SEA5000 Phase 1 - Future Frigate
QL035	RAN Electronic Warfare Capability Development Strategy (Phoenix)	QL093	QL093 SEA1439PH6 Collins Class Sonar Upgrade
QL036	UHF and VHF in Urban Environments	QL094	Process Development for AN/BYG-1 Technical Insertions
QL037	Network Centric Organisation Industry Consortium Products	QL095	JP2089 PH4 Pre-Project Initiation Scoping Study
QL038	DSTO Management Tools	QL096	SEA5000 Phase 1 - Navy Class Engineering Concept

Two LongLooks, 16 QuickAnswers, 147 QuickLooks and 63 Tasks

QuickLooks (Contd.)		Tasks (Contd.)	
QL097	JP3035-2 Core Simulation Activity	T007	Joint Offshore Protection Command
QL098	Pre First Pass Joint Force Integration	T008	Expeditionary Mine Counter Measures
QL099	HALE Aircraft Australian Industry Involvement	T009	Simulation Support for Conduct of Operations
QL100	Future Fleet Virtualising	T010	Far Target Locator
QL101	JP3025PH1 Deployable SO Engineer Capability	T011	User Defined Operating Picture
QL102	Opportunities for Accelerated Acquisition Study	T012	Operations Personnel Tracking
QL103	SEA5000 ASW Capabilities	T013	Networked Anti-submarine Warfare
QL104	SEA5000 Integration Considerations	T014	Cross Domain Web Browsing
QL105	Integrating Operational Concept Documents	T015	Joint Operations Data Management
QL106	Future Hydrographic Survey Capability	T016	Coalition Fires
QL107	Cancelled	T017	Air Movement Coordination Centre Despatch Capability
QL108	Reform of GSE Delivery Model	T018	RAAF Enhanced Security Situational Awareness
QL109	SEA1179PH2A Patrol Boat Replacement Requirements	T019	Joint Decision Support and Simulation Capability
QL110	Tactical Personal Area Networking	T020	Air Battle Management - Tactical Data Mining
QL111	JP3035-2 Core Simulation Capability	T021	Maritime Operational Analysis Centre - Information Management
QL112	SEA500-3 ANZAC Class Tactical Comms Electronic Support Capability	T022	Bomb Disposal Technology
QL113	CIOG Disability Services (Desktop Support for Hearing Impaired Personnel)	T023	ESM Interference Remediation
QL114	SEA1000-5 DWTR	T024	System Assurance
QL115	LAND 125 Ph4 – Soldier Combat System	T025	Improvised Explosive Device Detection
QL116	A Defence Innovation Strategy	T026	Management Information Systems for Operations (Electronic War Diary)
QL117	Integrating Operational Concept Documentation Validation Workshops	T027	Collaborative Planning
QL118	CBRN Universal Canister	T028	ARH Data Link
QL119	SEA129 Maritime Tactical Unmanned Aerial System	T029	Initial eHealth System
QL120	Future Electronic Warfare Operational Support Enterprise Needs Study	T030	Land Track Management Proof of Concept
QL121	AIR 5077 Ph6 AEW&C Wedgetail Capability Assurance Program	T031	Task Group Mine Countermeasures
QL122	LAND 154 Ph3B JCIED Future Technology	T032	Air Combat Officer In-Flight Instructor Aid
QL123	SEA 5000 Systems Integration (QL104 Follow-On)	T033	Explosive Ordnance Disposal Data Logger
QL124	SEA1000 Future Submarine Threat Countermeasures	T034	FOB Eye
QL125	Air Movements Solution	T035	Methods for identification of Common and Like Items
QL126	Joint Fires in the Exploratory Force	T036	Integrated ISR Backbone
QL127	Joint Fires Emerging Technology Study	T037	Cancelled
QL128	Federated Systems Integration Laboratories	T038	Strategic Common Picture
QL129	Defence Health JP2060-4 Validation	T039	Internet Text Messaging on AEW&C Aircraft
QL130	Land 129 UAV PH4 Validation	T040	Submarine Communications Information Management
QL131	Ship Zero Concept	T041	Aggregated Technical Risk Operational Decision Support Tool
QL132	Test Documentation Better Practice	T042	Electronic Order of Battle
QL133	Army Aviation Information Exchange Requirements	T043	Transfer of Imagery in support of EOD Operations
QL134	JP9101 Enhanced High Frequency Communication System	T044	CBRN Warning & Reporting System Concept Demonstrator
QL135	Future Camouflage and Concealment	T045	Security Architecture and Access Control within an SOA environment
QL136	Deployable Infrastructure System	T046	X-DeBI Security Accreditation
QL137	Amphibious Warfare	T047	JP2048 Ph4AB Command and Control System
QL138	ADF TS Network Requirements	T048	Reserve Reform Stream - Forcenet
QL139	Counter CBNRE	T049	SEA1430 Digital Hydrographic System and MGI project relationships
QL140	Air Force Network Battlelab Concept	T050	AIR5397 Ph2 Industry Infrastructure Assistance
QL141	Force Design Method Review - Best Practice	T051	Standoff IED detection - Hyperspectral Imaging
QL142	SEA2400 Hydrographic Survey	T052	Twin-Rotor UGAV for CIED/CBR Detect Applications
QL143	Enhanced HF Comms Follow-On	T053	JP154 Phase 2 - Multi Role RF Equipment
QL144	L8140 Deployed Force Infrastructure	T054	CIED Hand Held Detection
QL145	Land125-4 Integrated Soldier Combat System	T055	JP2072 Phase 3 Vehicle Adaptive Antenna System
QL146	L1771-2 Geospatial Support System	T056	Land Systems Integration Environment
QL147	JP9350 Space Situational Awareness Mission System	T057	AIR5405 Air Battlespace Management System Study
Tasks		T058	KA350 Front Right Hand Seat ACO/AvWO Training
T001	Rapid Environmental Assessment	T059	Land 17-1C.2 Ammunition Storage, Handling and Distribution
T002	Communications Efficiency	T060	Tactical Mesh Network
T003	P-3 ISR Networking	T061	ADF Unmanned Platforms Environment
T004	Tactical Coordination of Joint Fires	T062	Broad Spectrum CBRN Respiratory Filter Canister
T005	Capability Network Options Assessment	T063	Army Deployable Power and Water
T006	Intelligence Requirements and Collection Management		