Australian Government

Department of Defence

Science and Technology

DST Group Partnerships Week 2016 Melbourne

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Overview

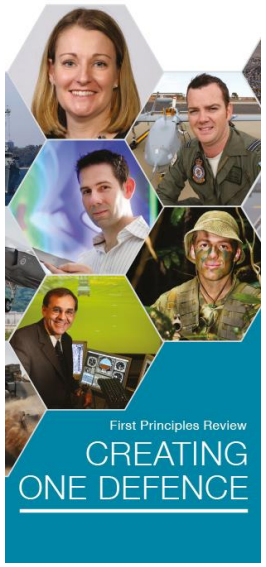
Dr Len Sciacca

Chief Science Partnerships and Engagement
Science Partnerships & Engagement Division- Canberra

DST Group Partnerships Week
June 2016

Defence Science and Technology Group at a glance

Shifting Defence Research Landscape



Defence science & technology to have strong partnerships: industry, universities and international

Set priority areas for defence science and technology as well as innovation strategy

Defence Science and Technology Capabilities

Science Strategy and Program Division Develops science policy, formulates Defence S&T and strategic research programs, and oversees resource investment into S&T capabilities.

Science Partnerships and Engagement Division Coordinates and develops interactions with industry, academia, overseas agencies and other Australian government agencies. Promotes defence science in the education and wider Australian communities.

Research Services Division Delivers enabling services including science information management and technology, research infrastructure, scientific engineering and support, laboratory emergency management, safety and security.

Sonar Technology and Systems Undertakes research, development, test, evaluation and prototyping of undersea acoustic sensors, systems and concepts to counter undersea threats.

Signature Management These two MSTCs conduct research into **1. Acoustic and 2. Non-acoustic** (radar, infrared and visible) signature treatment and control.

Maritime Autonomy Leads the development of systems operating independently in complex environments, and intelligent sensor payloads.

Undersea Command and Control Enhances ADF undersea warfare effectiveness.

Maritime Platform Performance Enhances the capability requirements definition, performance, safety and through-life management of ship and submarine structures and propulsion systems.

Platform Survivability Enhances defence platform survivability through vulnerability and recoverability analysis.

Land Human Systems Develops, sustains and applies the broad cross-section of human science skills in support of ADF land operations.

Land Vehicles and Systems Conducts research in vehicle systems management, armour and protection, logistics and integrated support systems.

Chemical and Biological Defence Research and development of defence against chemical, biological and radiation (CBR) threats.

Land Personnel Protection Supports soldier combat system development, and analysis of threats affecting the soldier.

Aerospace Systems Effectiveness Supports Defence outcomes in capability, efficiency and safety by providing advice and solutions where humans and air platforms or systems interact.

Aircraft Performance and Survivability Conducts performance and survivability modelling and experimentation for flight, propulsion, signatures and stores carriage and clearances.

Aircraft Health and Sustainment Supports aircraft health management systems and technologies, engine and fuel integrity, and aerospace systems sustainment analysis.

Airframe Technology and Safety Works to ensure aircraft safety and availability, reduce fleet cost of ownership and advises on acquisition projects.

Aircraft Structures Provides safety-critical aircraft structural integrity and airworthiness advice and solutions to the ADF.

Applied Hypersonics Supports technology for propulsion used in air vehicles traveling at speeds in excess of Mach 5.

Three JOAD MSTCs develop and apply analytical methods, techniques and tools to inform decisions impacting: **1. Aerospace Capability, 2. Land Capability and 3. Maritime Capability.** This encompasses specification, procurement, command and control, underpinning technologies, force structure and training, and their contribution to operational effectiveness.

Joint Capability Analysis Supports joint capability issues, including through the DST Group operations support centre by immersion and experimentation with warfighters.

Strategic Capability Analysis Informs strategic policy and capability decisions by applying analysis, concept development, risk assessment and technology forecasting.

Decision Sciences Enhances military decision making at individual, team and organisational levels in terms of intent, capabilities, awareness and control including human and machine perspectives, and their integration.

Intelligence Analytics Develops situational awareness capabilities for intelligence analysts and conducts domain-specific research into human, open-source and all-source analysis techniques.

Information Integration Supports the integration and application of intelligence, surveillance and reconnaissance (ISR) systems.

Intelligence Systems Develops intelligence systems for geospatial intelligence and measurement and signature intelligence, and imagery-based capabilities.

Surveillance and Reconnaissance Systems Conducts research into surveillance and reconnaissance systems and assesses their application to defence and national security needs.

High Frequency Radar Enhances long-range over-the-horizon radar as part of the national intelligence, surveillance and reconnaissance system.

National Security Provides a whole-of-government coordination program for science and technology needs relating to national security.

Cyber Assurance and Operations Supports enhanced performance in the presence of threats and unauthorised activities on computer resources.

Cyber Sensing and Shaping Develops techniques for accessing, characterising and shaping communication networks to enable cyber operations.

Assured Communications Provides solutions for robust communications in contested, complex and dynamic environments.

Systemic Protection and Effects Analyses and supports critical cyber physical systems, with respect to systemic electronic attack.

Spectrum Sensing and Shaping Supports enhanced situational awareness in complex RF environments, and defeating the future networked EW, cyber and kinetic threats.

EW Operations Provides countermeasures for detecting and defeating threats using the electromagnetic spectrum.

Weapons Guidance Technology Undertakes research, development and analysis of the guidance systems of modern weapons.

Combat and Mission Systems Develops combat and mission systems for maritime and airborne platforms, and the tactical networking between air, sea and land platforms.

Weapons and Combat Systems Assessment Assesses individual weapon system performance and end-to-end combat system effectiveness.

Land Weapons Systems and Effects Supports all aspects of ADF unguided weapons.

Energetic Materials and Systems Research into the delivery of appropriate destructive energy to targets.

But…capabilities complete with external capabilities

University Partnerships

The University of Adelaide
Monash University
University of Southern Queensland
Deakin University Australia
Victoria University
Swinburne University of Technology
University of Wollongong
University of South Australia
UTAS
Flinders University
Curtin University
ANU The Australian National University
La Trobe University
The University Of Queensland Australia
University of Western Sydney
Charles Darwin University
The University of Newcastle Australia
UNSW The University of New South Wales
The University of Western Australia
The University of Sydney
Macquarie University
ECU Edith Cowan University
UTS University of Technology, Sydney
QUT Queensland University of Technology
RMIT University
The University of Melbourne
University of Canberra

Defence Industry Partnerships

ASC
BAE Systems
Boeing
SAAB
IBM
Lockheed Martin
Northrop Grumman
Thales
Airbus Defence & Space
Raytheon
QinetiQ
CEA Technologies Pty Limited

PFRAs

CSIRO
Australian Government Bureau of Meteorology
Ansto

CRCs

Data to Decisions CRC
DMTC Defence Materials Technology Centre

SMEs

Commercialisation agreements
Licence agreements
Collaborative projects
ReSET Panel ($50m)

QXBranch

Australian Government IP Australia

defence science institute

Vic (NSW SA)

Australian Defence Science and Technology Capabilities

- Defence is viewing external PFRA, industry and university capabilities **as being part of the Defence Science and Technology capabilities**
- Partnerships and improved engagement mechanisms are making it possible to leverage Australian capability.
  - Defence Science Partnerships – Universities
  - Industry collaborations – Primes and SMEs
  - SME engagement framework
  - Multi-party arrangements
  - Sharing staff – exchange of staff to industry and universities

Defence White Paper (2016)

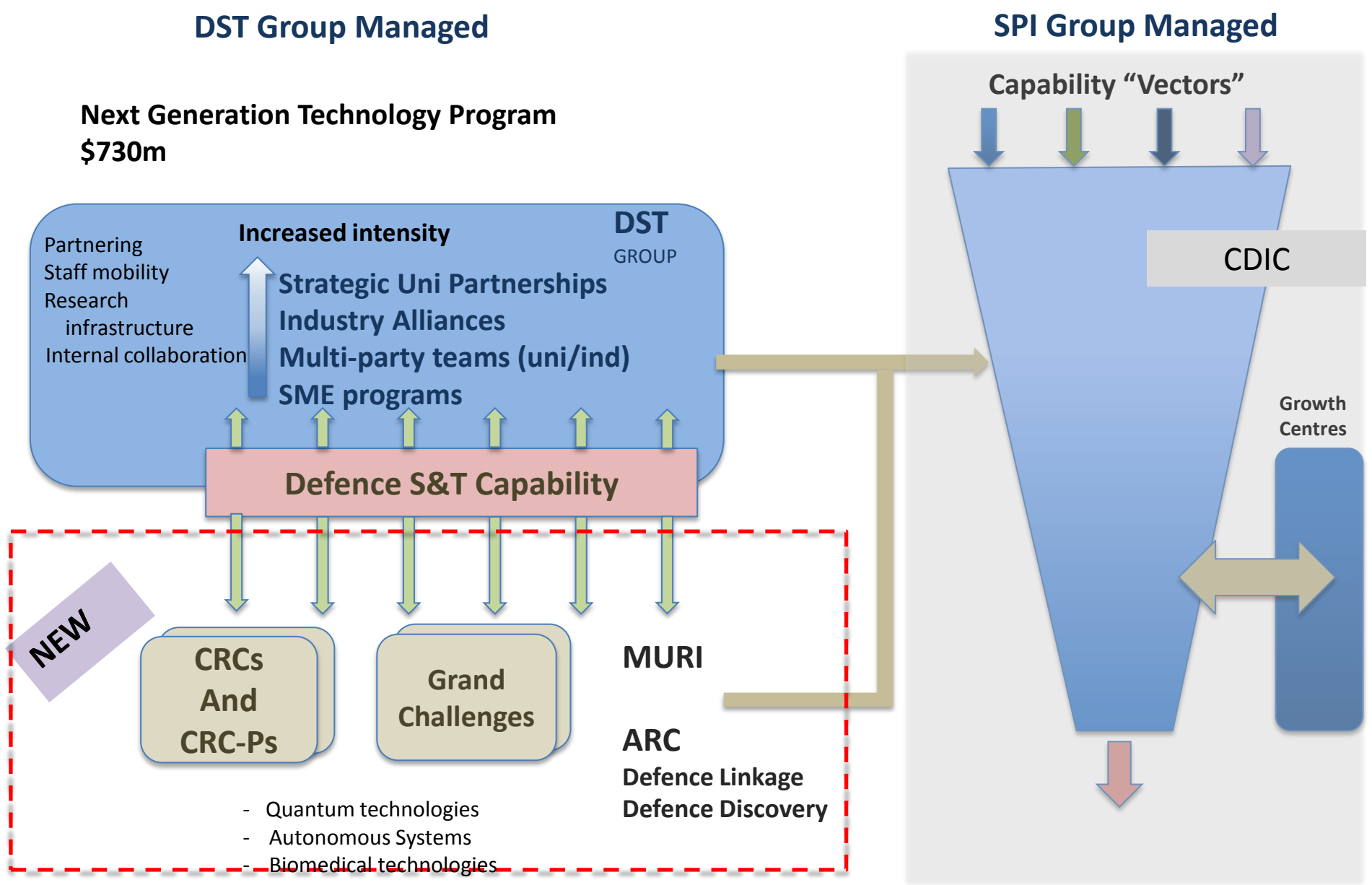
- "Over the next two decades, other technological advances such as **quantum computing, innovative manufacturing, hypersonics, directed energy weapons, and unmanned systems** are likely to lead to the introduction of new weapons into our region."

Defence Industry Policy Statement (2016)

Examples of priority areas of work for the Next Generation Technologies Fund, as identified in the Integrated Investment Program, include:

- **integrated intelligence, surveillance and reconnaissance**
- **space capabilities**
- **enhanced human performance**
- **medical countermeasure products**
- **multidisciplinary material sciences**
- **quantum technologies**
- **trusted autonomous systems**
- **cyber**
- **advanced sensors, hypersonics, and directed energy capabilities**

Innovation in Defence Science and Technology



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Strategic Industry R&D Alliances

Ms Devita Pathi

LLB (Hons)/BSc, Grad Dip Law (IP)

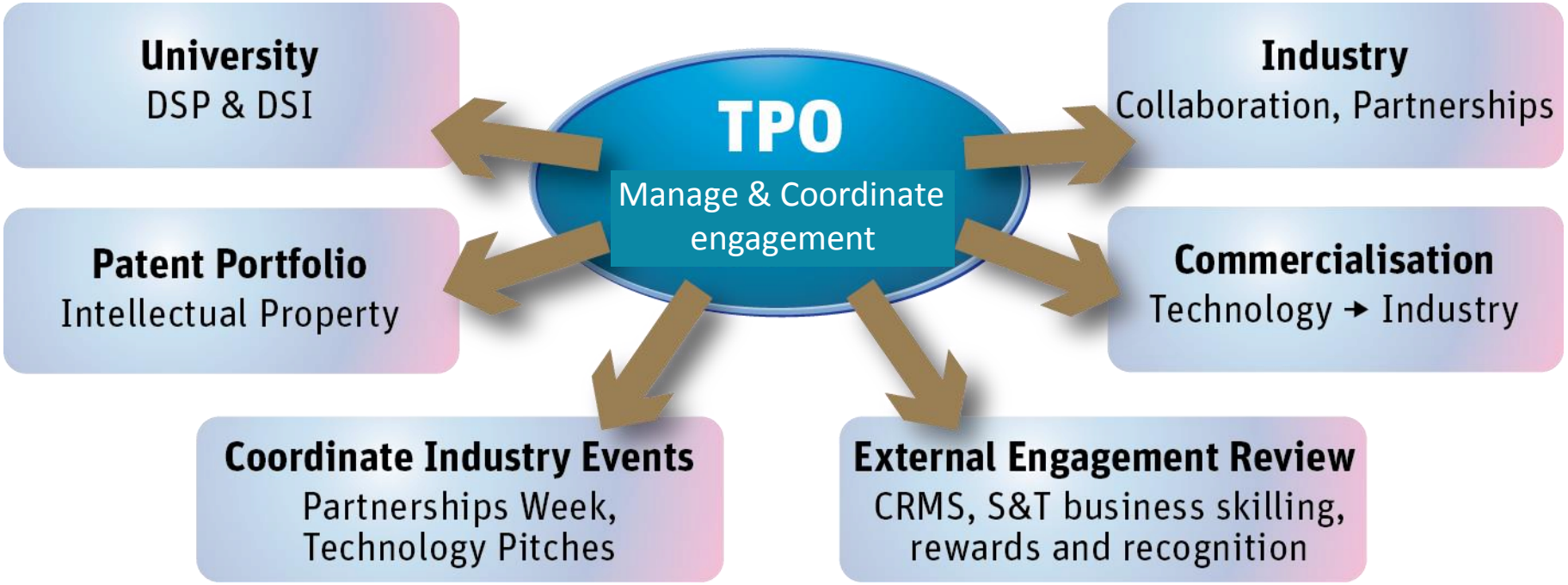
A/Director Industry Engagement

Technology Partnerships Office - Edinburgh

DST Group Partnerships Week

June 2016

Technology Partnerships Office



Technology Partnerships Office

Responsible for:

- Business, commercial, commercialisation and intellectual property management advice and support
- Prepare and negotiate collaborative R&D and other relationship agreements
- Intellectual property management
- Commercialisation of DST Group technology
- Commercial / Consultancy work

Focus on:

- Strategic partnerships and expert advice / support
- Industry Alliances
- Defence Science Partnerships
- Small to Medium Enterprise engagement
- Intellectual Property commercialisation & management

Some of our Industry Alliance Partners

Industry Alliances

Purpose

DST Group – leverage industry R&D capabilities to deliver Defence Capability

INDUSTRY – to enhance potential future commercial opportunities

Through

A close, long term, strategic, non-exclusive communication and collaboration relationship which is capability focused.

With

Companies that have significant indigenous R&D capability and capacity to collaborate with DST Group, create a synergistic relationship and in turn leverage each others capabilities to collaborate

Alliances are not

- Mechanisms to contract industry to provide goods and services
- Contracting continues in accordance with current Commonwealth Procurement Rules and Defence Procurement Policies (e.g., value for money, open competition)

Industry Alliances

Strategic Industry R&D Alliance in practice:

- Engagement mechanism with Defence Prime Industries
- Facilitate the establishment of long term strategic collaborative R&D relationship
- Must have an indigenous R&D capability
- Collaborative research projects entered under an Interactive Project Agreement
- Governance requirements specified (highly transparent)
- IP ownership addressed
- Consistent wording and layout
- Dispense with legal review

= ease of doing business

Point of Contact

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Strategic University R&D Alliances

Mr Robert Peile

Director University Engagement
Technology Partnerships Office – Fishermans Bend

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UNIVERSITY ENGAGEMENT

- Defence Science Partnerships
- Defence Science Institutes
- Expressions of Interest for Strategic Research Programs
- Secondments

DEFENCE SCIENCE PARTNERSHIPS

- 318 current agreements
- 100 agreements in negotiation
- Research, collaborations, student projects, loan of equipment, secondments, scholarships

DEFENCE SCIENCE INSTITUTES

- Partnership between state government, DST Group and Universities
- Currently set up in Victoria, in process of setting up in NSW and SA
- DST Group seconds at least one senior scientist to help run the institute
- Connect industry and researchers to undertake projects of relevance to Defence

EXPRESSIONS OF INTEREST FOR STRATEGIC PROJECTS

- Based on how best can you solve our problems
- We are looking for input, suggestions and creativity
- Partnership in Assistive Technology Innovation (PATI)
- Aims to build a world leading and self-sustaining entity

EXPRESSIONS OF INTEREST FOR STRATEGIC PROJECTS

- HPRnet:
- New scalable strategic approach to Defence focussed research (based on addressing AMEL roadmaps)
- Outcome focussed research within a cross-disciplinary network

EXPRESSIONS OF INTEREST FOR STRATEGIC PROJECTS

- HPRnet timeline:
- HPRnet site launched during PW16
- EOI out in June immediately following PW16
- First pass assessment in July
- Second phase assessment July/August
- Contracting and outcomes distributed Aug/Sept

SECONDMENTS

- University of Tasmania Prof Dev Ranmuthgala is leading, developing the research programme in hydrodynamic and hydroacoustic capability for two years
- Number of DST Group scientists seconded to universities to carry out collaborative research projects

Point of Contact

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Director University Engagement

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Government Engagement & Relations

Mr Barry Stanton

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Our PFRA and Government Collaborations

CSIRO

Australian Government
Bureau of Meteorology

Australian Government
ANSTO

Australian Government
Department of Defence
Defence Science and Technology Group

Australian Government

DATA TO DECISIONS CRC

Australian Government

AUSTRALIAN INSTITUTE OF MARINE SCIENCE

Connect, Partner, Collaborate, Innovate

Our Objectives

- Shape Australian Science and Technology Capability
- Build collaborations that promote engagement with and across sectors
- Mechanisms
  - Staff Exchanges
  - Technology Transfer
  - Shared Facilities
  - Collaborative research

Example Research Collaboration

- Space weather and ionospheric modelling
- Satellite systems
- Particulate modelling
- Ocean modelling
- Super computer
- Radar modelling
- Medical counter measures

Barry Stanton

Director Government Engagement and Relations

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SMALL TO MEDIUM ENTERPRISES
ENGAGING WITH DST GROUP

Mr Robert Peile

Director University Engagement
Technology Partnerships Office – Fishermans Bend

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DST GROUP NEEDS

- DST Group doesn’t have a mortgage on the best ideas
- DST Group needs to get our technologies to the end user
- DST Group doesn’t have all the expertise we require
- DST Group need to collaborate

IDEAS

- SME Engagement Strategy being developed
- Better understand ideas, technologies and solutions to problems
- Extensive consultation with industry
- Defence Science Institute being used to bring industry and researchers together to explore ideas

TECHNOLOGY TRANSFER

- Technology Pitches
- Held at major trade shows co-ordinated with Defence Science Institute
- SMEs have joined the activity
- Licensing discussions advanced on about 30% of licensing opportunities pitched

TECHNOLOGY TRANSFER

- 2 Page licence with no licence fees
- Simple template process for application to access technologies
- Guide to assist SME's
- Non-exclusive with no license fees or royalties
- Not for all DST Group technologies

EXPERTISE

- Secondments are a great way to access DST Group expertise and for DST Group to access expertise from other organisations
- DST staff member goes on to the organisation for a set period of time before returning to DST Group.
- Technical know how to the company
- Up skilled employee to DST Group

COLLABORATE

- New Collaboration template for bi-lateral and Multi-party agreements
- Must be a value proposition to develop technology
- No money changes hands
- Opportunity to shape technology development to suit the market

Point of Contact

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Department of Defence
Science and Technology

Innovating with Defence

Mr Peter Kerr

Program Leader – Innovation
Russell Offices Canberra

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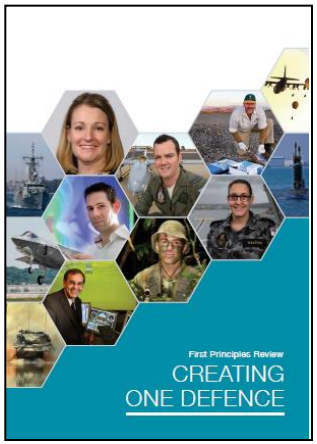
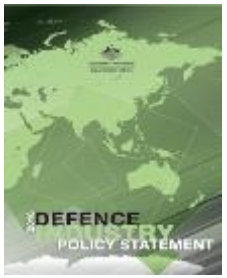
Strategic Context for Defence Innovation

"Driving Australian innovation is a critical element of the Government's vision for the nation. "

Section 3: Defence Industry Policy Statement

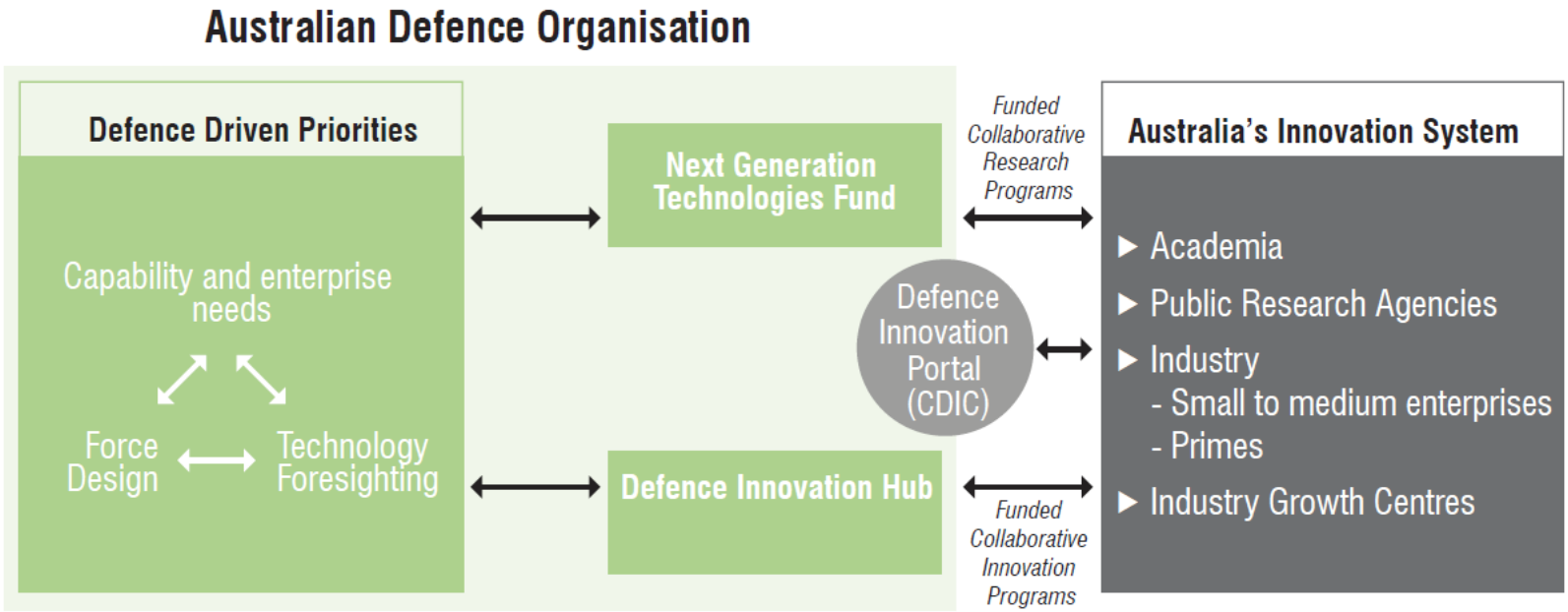




"I find innovative people very interested in working with defence. And that, for two reasons – they understand the importance of what we do and they're people who like to make a difference. And it makes a difference to protect people. What they lack isn't interest. It's familiarity."
Secretary Ash Carter, US Secretary of Defence

University of Texas, Austin – April 2016

Principle Elements of Defence Innovation



Strategy → Capability ← Partnering

Capability ↓

Four Announcements

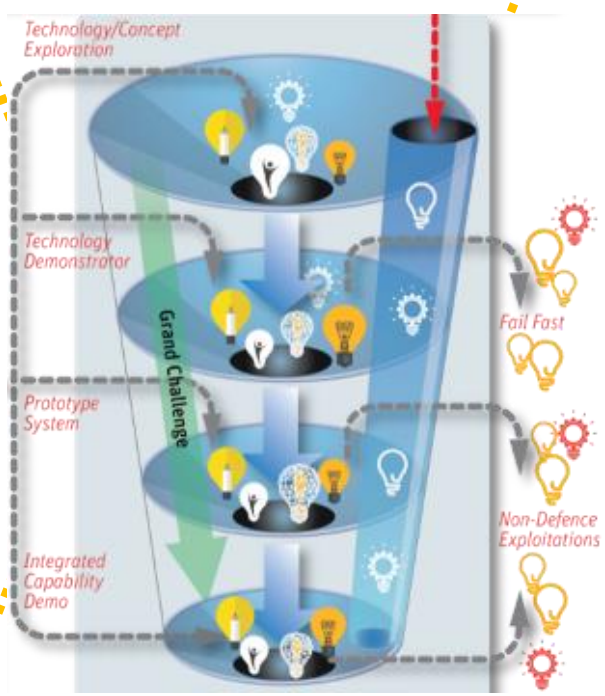
- **Next Generation Technologies Fund** — $730 million (over the decade to FY 2025–26) will be invested in strategic next generation technologies that have the potential to deliver game-changing capabilities.
- **Defence Innovation Hub** —around $640 million (over the decade to FY 2025–26) will be invested in a new virtual Defence Innovation Hub to enable industry and Defence to undertake collaborative innovation activities throughout the Defence capability life cycle from initial concept, through prototyping and testing to introduction into service.
- **Defence Innovation Portal** — The Centre for Defence Industry Capability (CDIC) will establish a Portal to facilitate engagement between Defence and innovation activities across Australia.
- **Changed culture and processes**—Defence will change its culture and business processes to systematically remove barriers to innovation. The first step will be to develop **new contracting and intellectual property policies** that encourage investment in Australia's good ideas, keep profits in country, and provide incentives for larger companies to innovate in Australia.

Delivering Defence Innovation

The HUB

- Technology/Concept Exploration
- Technology Demonstration (CTD) (DMTC)
- Prototype System (RPDE) (DMTC)
- Integrated Capability Demonstration
- Defence-Industry Collaboration

Defence Cooperative Research Centres



Next Generation Technologies Fund

- Defence Cooperative Research Centre
- Strategic Research Initiative
- Multidisciplinary University Research Initiative
- Small Business Exploratory Tasks
- Grand Challenges

Summary of Innovation Initiatives

- FPR recognised S&T as a Defence capability
- NISA provided new national focus on innovation
- DWP 2016 provides importance and funding for science, technology and innovation
- Significant opportunities for DST
- Our Strategic Plan and Initiatives will lead the way.

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DEFENCE INNOVATION & CAPABILITY AND TECHNOLOGY DEMONSTRATORS

Andrew Arnold

Director Innovation Programs

June 16

Capability and Technology Demonstrators (CTD) - Objective

For 18 years the CTD Program has improved Defence capability by providing Australian Industry and research institutions with opportunities to demonstrate their technologies; allowing Defence to assess their potential and risk

Key Features of a CTD Project

- Focused on a Demonstration; not on delivering a product
- Industry led; however, a Defence Project Manager oversees the life of the CTD
- Not a grant – ASDEFCON contract variant
- CTD Contract -
  - Target Performance Measures are used in lieu of Specifications.
  - Default position is for industry to own the foreground IP

Defence Innovation

- **Centre for Defence Industry Capability**
  - Located in Adelaide
  - To host the **Defence Innovation Portal**
- **Defence Innovation Hub**
  - Virtual organisation through which innovation proposals will enter Defence
  - Collaborative innovation activities that will include the CTDs
- **Next Generation Technologies Fund**
  - Administered by Defence Science and Technology Group
  - Strong relationship with the Innovation Hub

The 2016 CTD Cycle

- **May 2016:** A new Round is opened with a public call for *Initial Proposals – AUSTENDER, Australian*
- **25 July 2016**: ***Initial Proposal*** submission closes
- **August 2016:** if your initial proposal attracts Defence interest, you are invited to produce a ***Detailed Proposal***
- **Late Sept 2016:** Requested ***Detailed Proposals*** submitted to Defence
- **Early 2017:** ***Detailed Proposals*** endorsed internally and recommended to Government for funding.
- **Mid-2017:** CTDs are contracted between the proposers and Defence.

Five CTD Evaluation Criteria

1. **Potential to contribute to Defence Capability Development - the potential to provide a new or enhanced capability to Defence**

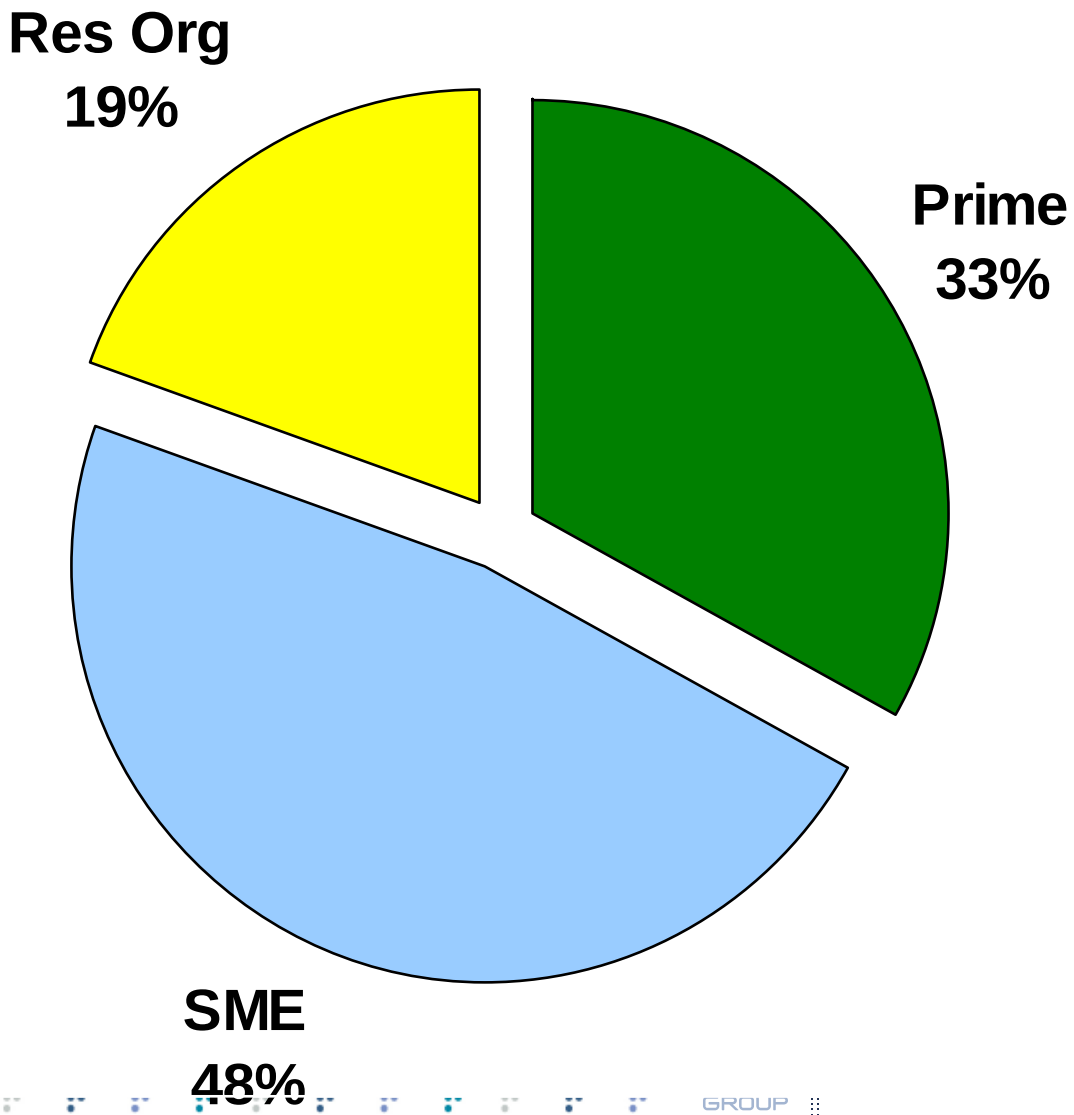
2. **Potential to Transition into Service - the presence of an identified need, or potential pathway into service**

3. **Technology and Innovation - the degree of technical innovation**

4. **Industry Capability Enhancement - the degree to which Australian Defence industry capability will benefit**

5. **Project Management – Our level of confidence in your ability to bring the CTD to demonstration.**

Who conducts CTDs?



Further information…

CTD Office

1800 647 946

ctdpo@defence.gov.au

www.dsto.defence.gov.au/partner-with-us/demonstrate-your-technology

PEGASUS Helo Floatation Device

Demonstrated in WA March 2013

Naval Automated Personnel Tracking

Joint Direct Attack Munition Extended Range

ADVANCED COMBAT HELMET SYSTEM

new bonding and laminating techniques
monolithic ceramic helmet shells