

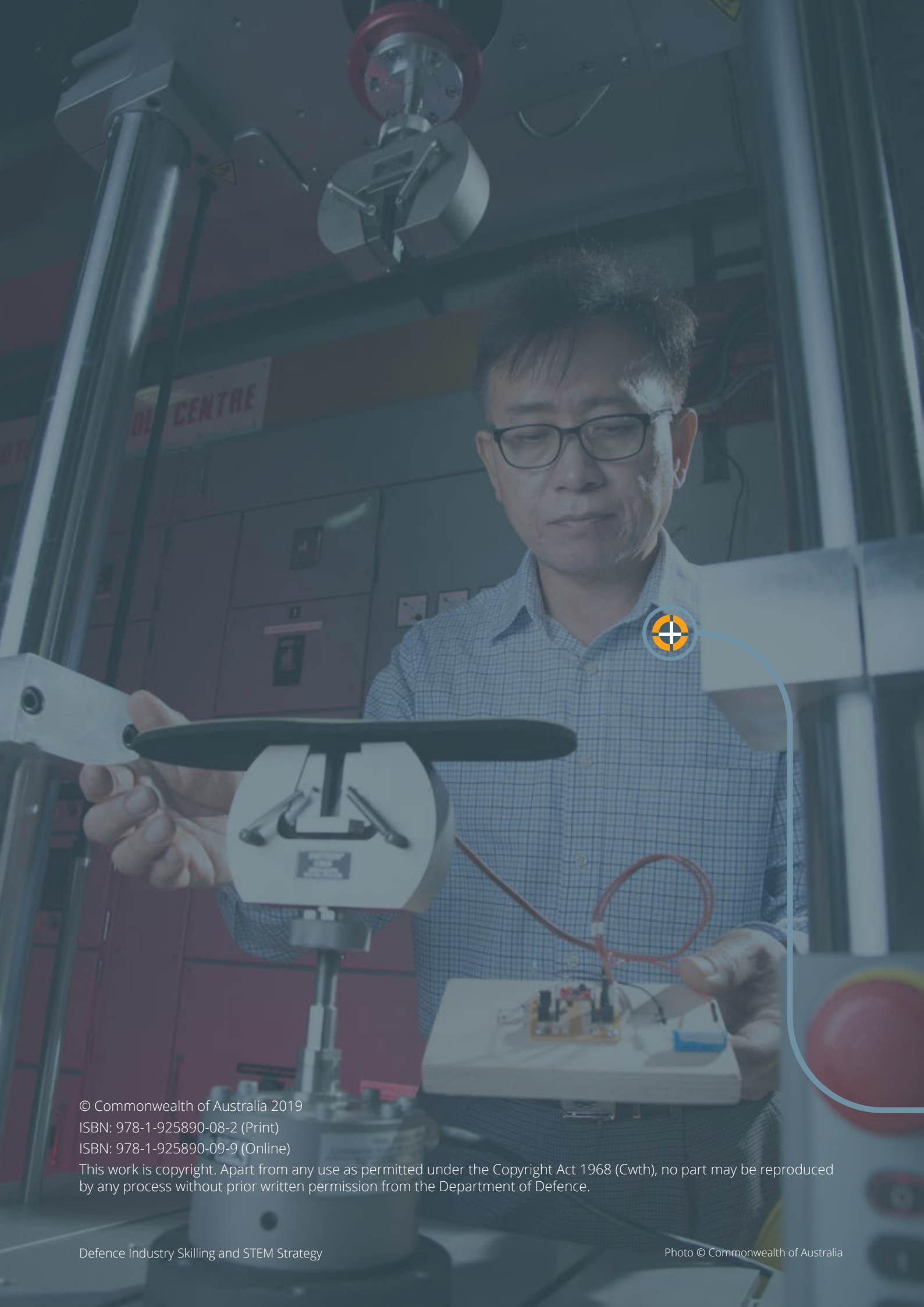


Australian Government

Department of Defence

Defence Industry Skilling and STEM Strategy





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Ministers' Foreword



In a time of increasing technological advancement and rapid change, Australia's defence industry will be competing with other sectors for the workforce needed to deliver and support critical Australian Defence Force capability. The Australian Government is focussed on investing in our future defence industry workforce, building better public awareness of the industry, supporting people to pursue careers in the industry, and helping businesses to develop their workforce capabilities through education and training.

We are pleased to release the first Defence Industry Skilling and STEM Strategy, which details how the Government will help Australia's defence industry to meet their workforce skills requirements over the coming decade. The Strategy is an important component in the suite of Defence's industry policies that support the Government's long-term vision to build and develop a robust, resilient and internationally competitive Australian defence industrial base that is better able to meet Defence's capability requirements.

The Government has agreed upon a new approach to funding defence industry skills support through the Defence Industry Skills Flexible Funding Pool to the total value of \$32 million starting 1 July 2019 to 30 June 2022. This funding model will help ensure that the Strategy is responsive to industry needs across the initiatives. This approach will also increase flexibility in the approach to targeting funding and developing innovative solutions with industry through the new National Defence Industry Skills Office (NDISO). This funding is in addition to the Government's support for the Naval Shipbuilding College.

2019-20 initiatives under the Defence Industry Skills Flexible Funding Pool include:

- **\$4 million** – A new model of skilling support grants administered through the Centre for Defence Industry Capability, focusing on improving accessibility for small and medium enterprises (SMEs) and reducing the barriers faced by defence industry in upskilling or retraining their people;
- **\$2.6 million** – Continuing the Schools Pathways Program, which encourages student engagement in STEM and introduces them to the many career pathways in defence industry;
- **\$1.4 million** – 20 additional places on the Defence Industry Internship Program (DIIP), bringing the total to 50 students per year, providing engineering students with direct connections to defence industry by facilitating 12-week internships with industry SMEs; and
- Establishment of the National Defence Industry Skills Office, which will improve collaboration and coordination between defence industry stakeholders, and maximise opportunities from wide-ranging investments to meet defence industry workforce needs. The NDISO will also align efforts to ensure access to essential skills relating to Sovereign Industrial Capability Priorities.

The Australian Government, states and territories, industry and the education sector must continue to work together to develop the people critical to the future growth of Australia's defence industry.

We thank the individuals and organisations that participated in the consultations and the survey that informed the development of this strategy.

We look forward to working together to achieve these objectives.



The Hon Christopher Pyne MP
Minister for Defence



The Hon Steven Ciobo MP
Minister for Defence Industry



Executive Summary

THROUGH ENHANCED
GOVERNMENT, INDUSTRY
AND EDUCATION AND
TRAINING SECTOR
COLLABORATION,
AUSTRALIA'S FUTURE
DEFENCE INDUSTRY
WORKFORCE CAN THRIVE.

The Australian Government is investing \$200 billion in Australia's defence capability over the next decade. The modernisation of Australia's defence capability will rely on diverse workforces both in Defence and defence industry and people with skills in Science, Technology, Engineering and Mathematics (STEM).

Defence industry comprises thousands of Australian businesses, employing women and men who are not in the Australian Defence Force but use their expertise, technical and trade skills to supply capability and support services. An appropriately skilled and STEM enabled workforce provides Defence and industry with the ability to innovate and solve problems, respond rapidly to changing military requirements and maintain a technological edge for Defence to achieve its mission: to defend Australia and its national interests.

As defence capabilities become more technologically complex, the demand for skilled people, including those with STEM skills, within defence and defence industry will increase. Defence industry does not face workforce and STEM challenges alone and Defence must target its support within the context of the national policy, economic, education and training environment.



The solutions will involve funding for targeted initiatives, better information sharing, coordination and collaboration across government, industry and the education sector. The Defence Skilling and STEM Strategy outlines the Government's intent to collaborate with industry to establish and maintain a sustainable workforce. In developing the Strategy, Defence undertook extensive consultation with defence industry representatives, industry peak bodies, tertiary and vocational education institutions, and state, territory and Commonwealth agencies.

From the consultation undertaken, Defence has identified four key areas of focus which will enhance collaboration with industry for the purpose of supporting the development and sustainment of the workforce of the future. Work in many of these four focus areas has begun. This Strategy ensures there is a clear and shared objective to overcome the resourcing challenges.

Focus on four key areas:



Focus 1 | Engage

- Improving access to information about defence industry career opportunities and support for the national effort to improve the take up of STEM studies and careers.



Focus 2 | Attract

- Supporting defence industry businesses to grow and attract a national defence industry workforce with the required skills.



Focus 3 | Train and Retain

- Encourage investment in skills and provide support to defence industry businesses to train and sustain a national defence industry workforce.



Focus 4 | Collaborate

- Facilitate stakeholder collaboration and coordination to improve understanding of future workforce needs at the sectoral level and enable faster responses from key stakeholders.



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Strategic Vision

Australia will have a defence industry with the workforce capacity and capability to meet Defence's needs.

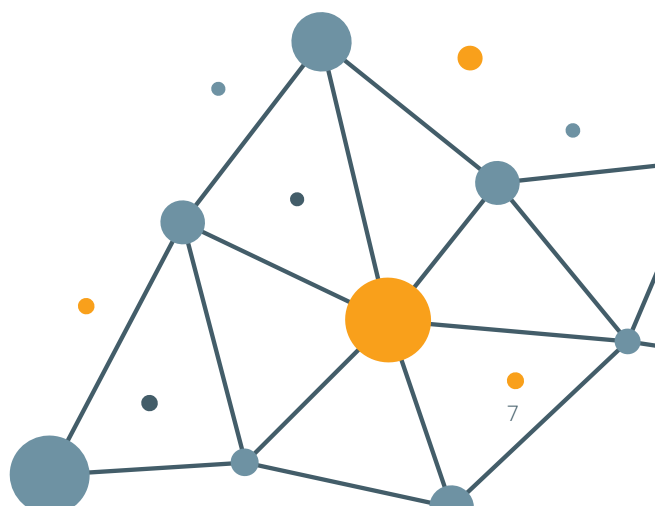
The Government is committed to growing a robust, resilient and internationally competitive Australian defence industrial base to help meet Australia's defence needs.

Australia's defence industry is critical to the acquisition, operation, and sustainment of Defence's current and future capability.

Australia's defence industry is made up of thousands of businesses of varying size and capability across multiple industry sectors, including manufacturing, information technology, research and development, and construction. Australia's defence industry directly contributes to the delivery of the military capability crucial to the defence of Australia across the spectrum of design, manufacturing, sustainment and support services.

Targeted and collaborative action is needed to increase the volume of people joining the sector, and to retain talent to ensure we can deliver Defence's capability requirements. This involves, encouraging investment in skills, addressing skills gaps and improving the productivity of existing workforces.

This Strategy targets gaps and opportunities within the broader defence industry policy and program environment, and the education and workforce development pipeline.





The Defence Workforce of the Future

Defence is seeking to build Australia's defence industrial base at a time of accelerating technological growth and competition for skills.

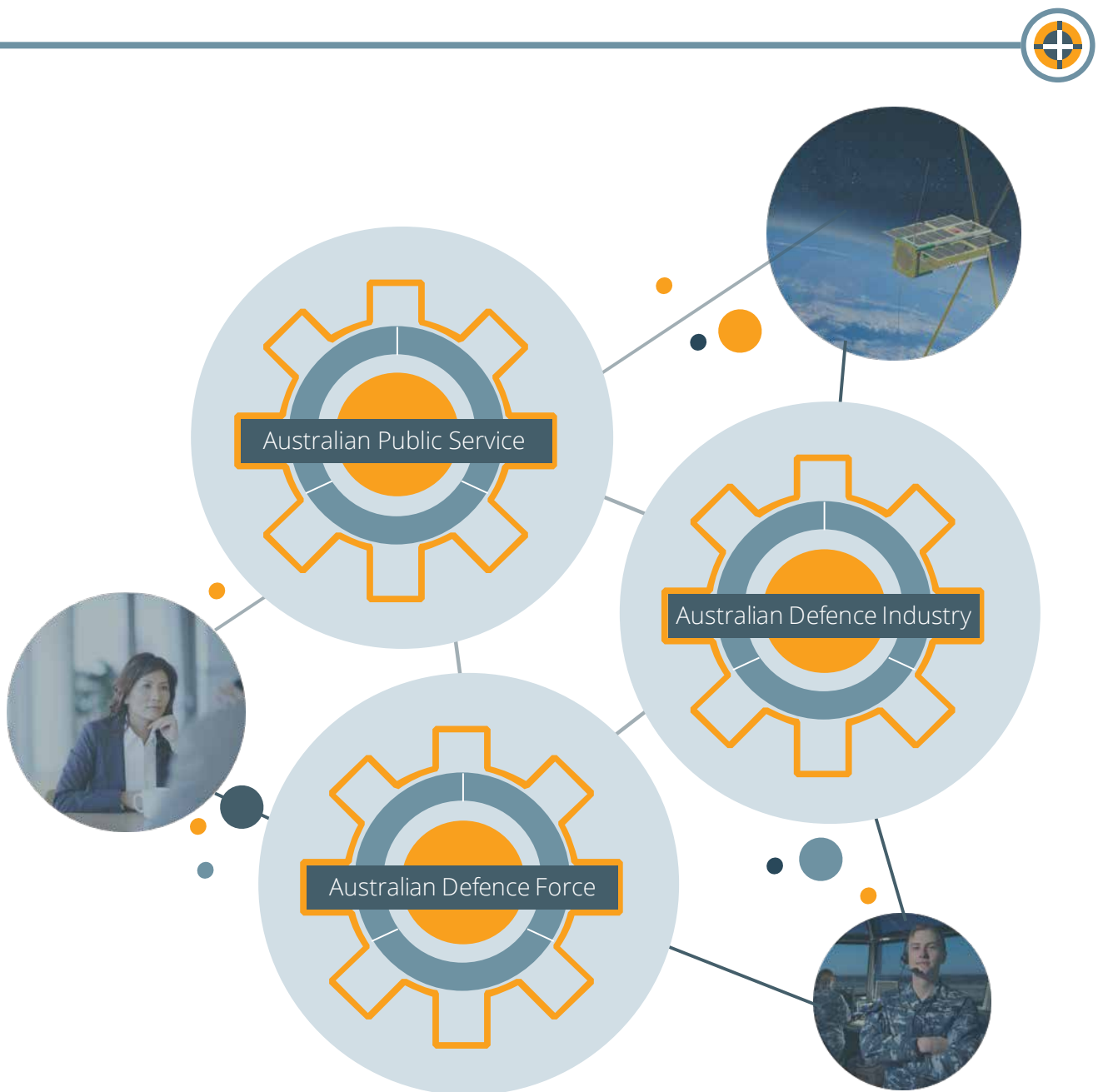
The Government's investment in Defence capability, and proactive defence industry policies, will deliver significant opportunities for Australian industry and generate an increasing demand for a highly skilled and STEM specialised workforce.

This includes an increase in demand for Australian workers with trade, technical, and science and technology skills to build and maintain new ships, submarines, armoured vehicles, infrastructure and facilities; and contribute to intelligence, surveillance and reconnaissance, cyber and other electronic and information-based capabilities. Australian defence industry's design, construction, integration, sustainment, services and support capabilities will all be critical. Sustainment in particular constitutes a significant and ongoing source of work for Australia's defence industry. As defence technology becomes increasingly advanced, Australian industry will need advanced levels of technical expertise to compete for work in the global defence market.

There are thousands of SMEs employing many Australians across the country, supporting the Australian Defence Force (ADF) – making industry a fundamental input to Australia's defence capability.

The Australian defence sector workforce of today

The defence sector offers a wide range of roles for skilled workers, including STEM professionals. Throughout their careers, defence sector employees can, and often do, work in multiple roles across the ADF, the Australian Public Service and defence industry.



What type of skills are important to Australia's defence industry?

There are several broad, inter-related skill disciplines that are particularly relevant to developing and supporting the complex systems operated by the ADF.

While the following list of skill disciplines is unlikely to change significantly over the coming decade, particular areas may grow in their relative importance in order to meet Australia's defence requirements:



Engineering is fundamentally important to the design, construction and maintenance of the ADF's complex systems. Sub-disciplines of engineering have varying levels of relevance to defence technology and include systems engineering, mechanical engineering, civil engineering and electrical engineering.

The discipline includes degree-qualified engineers including specialists, such as aeronautical engineers or marine engineers; as well as those with vocational training in technical skillsets. Systems engineering is particularly relevant to complex defence projects and is in very high demand.

The nature of defence technology is such that engineering will continue to be a central requirement for Australian defence capability development.



Design assists with establishing the requirements for a project, creating a picture of the project's complexity and build process. It includes a number of sub-disciplines, such as computer-aided design (CAD), systems design, interface design and software design. Design has significant intersections with engineering.

Design professionals typically operate closely with engineers to reduce project risk. In some areas of defence industry, designers are also trained as engineers. This can be a particularly effective practice in large-scale and complex projects such as naval shipbuilding.

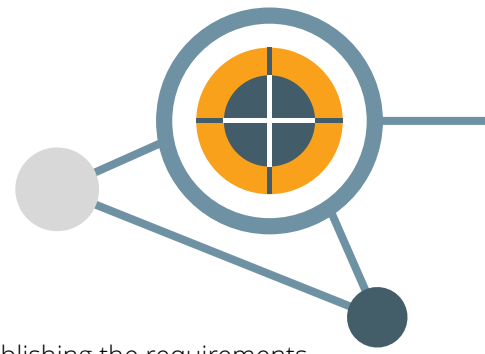
Digital design processes will be a major driver of Industry 4.0 trends over the coming decade, as they will assist industry to improve design accuracy and efficiency. While this means that the nature of design skills is changing, design skills will continue to be essential to Australia's defence capability.



Manufacturing skills are those which support industrial production methods, particularly those which involve the scaled production of goods. Associated skills include fabrication, welding, production design, and boiler making.

Australia's defence industry manufactures military platforms and systems, such as armoured vehicles, as well as the spare parts for systems. Military systems are usually produced in a smaller quantity than commercial technologies, making it more difficult to achieve and maintain economies of scale.

For this reason, novel manufacturing methods associated with Industry 4.0, such as additive manufacturing (3D printing), are of interest to defence industry. As in other advanced manufacturing sectors, the types of skills required may change, however the ADF will continue to be a consumer of manufactured goods.





Program Management includes a variety of skillsets which support the delivery of goods and services through effective planning and coordination. Specialists employed in program management can include contracting officers, project managers, project schedulers and cost estimators.

Australia's defence industry places particular importance on project management skills, due to the project-driven nature of defence.

More efficient program management methods are continually being developed, and aspects of the work are becoming more digitised. However, there will continue to be a significant requirement for program management skills in Australia's defence industry.



Logistics are required for every operational or training activity that the ADF undertakes and is absolutely critical for the management of ADF vehicles and assets. In the defence sector, logistics refers to the practice of planning and organising complex activities in support of defence capability, which could include arranging transport of people and materiel, or the maintenance of military systems.

Australia's defence industry can provide logistical support through fleet and asset management services or be contracted for maintenance services. Defence industry can also provide logistics management systems and training to the ADF, enabling logistics to be handled internally. This is particularly valuable in operational circumstances, where civilian support is much more restricted.



Support Services

Support to Defence can include a wide range of services, such as long-term maintenance for complex systems, training and simulation, and information and communication technologies (ICT) support.

Support services intersect with other disciplines in various ways; this is particularly true of ICT services. Computers and digital technologies are increasingly critical to every piece of modern military technology. Without the skills needed to support this digitisation, the ADF's technological advantage over potential adversaries would be eroded.



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Workforce challenges and gaps

Though Australia has a skilled productive labour base from which to draw, there are specialist skills and experience required in defence industry that take time to develop, above the training and experience in other industries. Once developed, they need to be maintained and retained.

Longer-term defence industry skills requirements can be hard to predict because they depend on the size, nature, and timing of Australian industry involvement in major capital equipment projects (and other major Defence procurements such as facilities and infrastructure).

Industry participants are, in many cases, competing for the same workforce and require many of the same skills across different sectors. Defence industry SMEs are especially vulnerable to shortages of skilled labour. Defence Primes and larger businesses typically have access to workforce development and management resources that SMEs do not. These can include capacity to invest in up-skilling existing workers, or running development programs for graduate-level employees.

Defence industry needs a balance of professional, trade, technical and managerial skills. Defence industry's dependency on a skilled workforce means it is vulnerable to the effect of rapidly emerging technology and broader workforce challenges. These challenges include competition from other sectors in the economy and from overseas, the output and quality of skilled workers from the education sector, and other social factors which influence an individual's career decisions.

As part of the Defence Industry Skilling Survey, respondents were asked to identify which employment disciplines they believed to be most affected by shortages. The responses identified Engineering as the discipline most affected, with 73.4% of respondents affirming a perceived shortage.

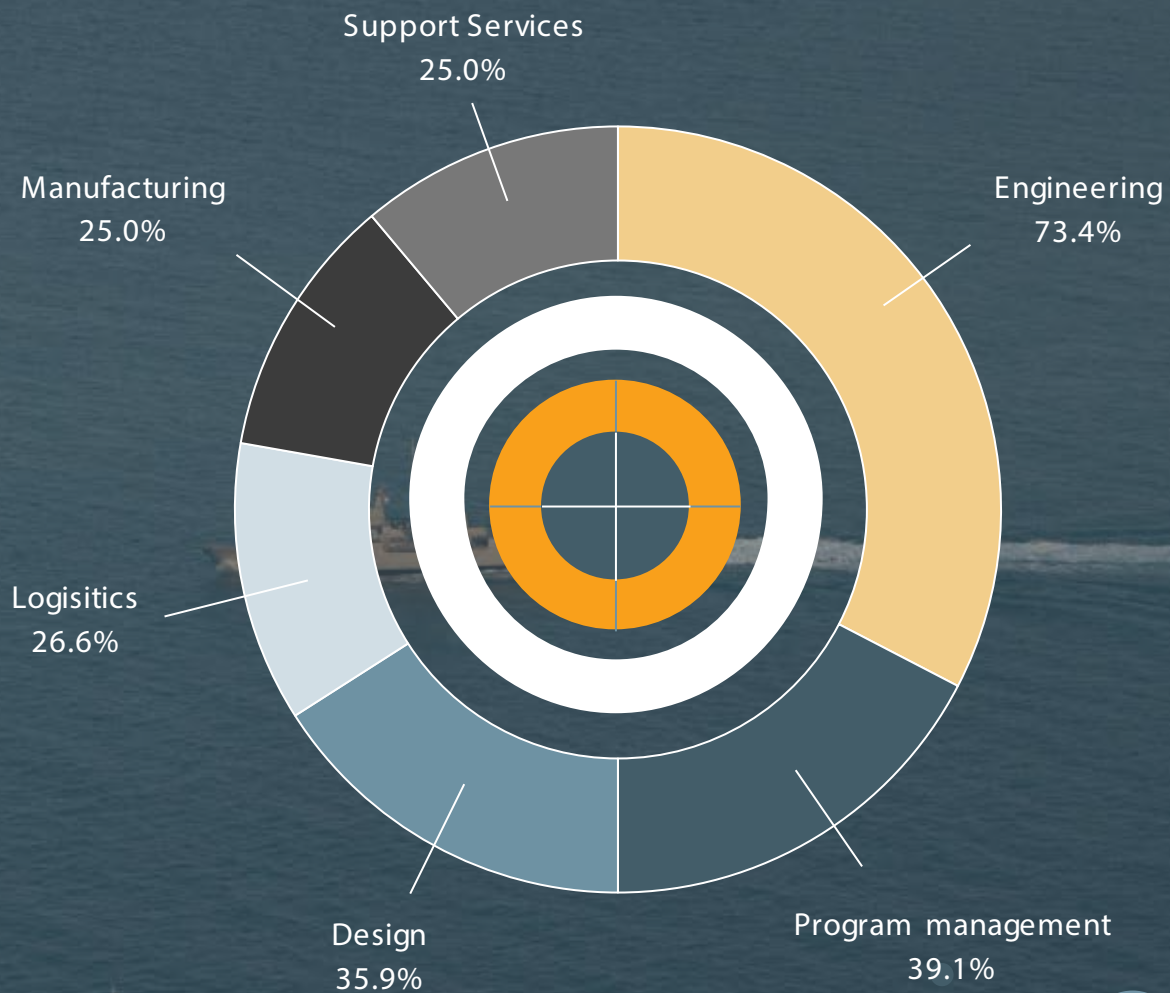
Changes in the nature of work are demanding a new range of skills for the modern workforce.

Lifelong learning is becoming increasingly important to adapting to automation and rapid technological change. Existing employees are an asset during times of change – and investing in training and development to retain staff can reduce the impact of skills shortages without relying exclusively on newly-hired staff. Up-skilled or re-skilled employees can build on their existing experiences and knowledge, and maintain their employability and value to the business as job competencies change.



72.4% of the businesses that responded to the Defence Industry Skills Survey indicated that they had experienced difficulty in the recruitment of skilled candidates in the past 12 months.

Responses to the Defence Industry Skills Survey indicated the following employment disciplines were most affected by shortages:



Within these disciplines, respondents were asked to identify the extent of shortages for relevant skillsets. The top eight skillsets identified as most affected by shortages (in descending order) are:

Design Engineering	Design engineers work at the advanced 'research and development' end of the engineering spectrum. A design engineer is responsible for creating the detailed design of a product, which takes engineering and physics principles into account.
Planning and Production	Planning and production is a combination of engineering and manufacturing roles, which together create processes for the manufacture of complex products. For example, designing and building a production line for the manufacture of vehicles.
Project Management	Project management occupations are responsible for coordinating and planning the cost, schedule and contracting arrangements for a project. Defence projects are often large and complex, and require significant coordination and management.
Systems Engineering	Systems engineering is a specialisation that examines complex systems as a set of sub-systems, to be managed holistically. Defence makes use of many complex systems, such as advanced aircraft, making systems engineering a valuable skillset.
Integrated Logistics	Integrated logistics support takes a strategic approach to the supply of required parts within complex systems. Logistics are a crucial element of ADF operational planning, industry supply chains, and the maintenance of ADF vehicles and systems.
Cyber Security	Cyber security is a broad term for ICT specialisations in computer network security which prioritise protecting sensitive networks against intrusion. Defence industry by definition deals in sensitive technologies, making it a prime target for cyber-attacks.
Software Design	Software design is an ICT profession that deals mostly with creating computer programs. In Defence, programs can also be developed for use in complex platforms: the Joint Strike Fighter's on-board systems entail millions of lines of software code.
Electrical Engineering	Electrical engineering is an engineering specialisation that is primarily concerned with electronics, as well as electrical and electromagnetic systems. Most Defence systems will have on-board electronics and many have electromagnetic systems, such as radar.

Increased competition for STEM skills

The growing requirement for STEM skills is economy-wide. Recent work by the Foundation for Young Australians found that by 2030, workers will spend 77% more time using science and mathematics skills (Foundation for Young Australians, *The New Work Smarts*, 2017). Further, an analysis of job advertisements found that between 2012 and 2015 the demand for digital literacy grew by 212% (Foundation for Young Australians, *The New Basics*, 2016).

According to the Australian Bureau of Statistics, from 2006 to 2011, jobs generally held by STEM qualified people grew by 14 %, which is 1.5 times as fast as other jobs (Australian Bureau of Statistics, *Perspectives on Education and Training: Australians with qualifications in science, technology, engineering and mathematics*, 2010–11, 2014). The Office of the Chief Scientist found that over the same time period, the number of Australians holding STEM qualifications increased by 15 %, compared with an increase of 26 % in people holding non-STEM qualifications.

Outcomes of Defence's survey and consultations complement the above findings, with Australia's defence industry perceiving a shortage of STEM-skilled tertiary graduates and an industry-wide concern that current graduation rates in STEM fields will not be sufficient to meet expected future demand for STEM skills in Australia.

There is an indication the market is being challenged by STEM professionals who don't have the required experience. Not all STEM fields are equally in-demand; competition for engineering graduates can be particularly strong. However, even in cases where there has been a sufficient supply of graduates, businesses require individuals with relevant 'enterprise skills' and experience to fill more senior positions. This 'experience gap' impacts organisations that are seeking to expand, and is further challenged by the poaching of experienced staff, which Defence's survey indicated can be a problem.

Where will the future workforce come from?

The skills needed in defence industry are delivered through a variety of education and training providers, including through Universities and other higher education providers and through work-based learning. Defence's consultation with industry indicated that vocational education and training skills are highly-valued. There are opportunities to strengthen the pathways between VET and higher education, as well as to build flexible certification systems. This will help to ensure the education system is more modular, agile, and responsive to the needs of businesses and individuals. Tailored training, such micro-credentialing, can support the attainment of specific skills, help reduce the cost and time of training, and enable individuals and businesses to access just what they need. The formal acknowledgement of skill sets and micro-credentialing in the qualifications framework is being considered in the review of the Australian Qualifications Framework.

Increased competition for STEM skills means that some employers are using non-traditional ways to attract and retain employees. For example, hiring "transferable talent" refers to companies hiring individuals who display promising talent, but who may not have the necessary experience, in order to stay ahead of competitors. Training and retraining existing employees helps businesses meet their skills needs for the jobs that are changing and the new jobs that are being created because of technological change. Upskilling also helps businesses retain employees, and provides pathways for individuals from other sectors to enter the defence sector and help meet defence demands.

A comparison of the skills identified as necessary for Defence's future workforce, and the skills currently identified as having capacity gaps, demonstrates that opportunities exist to improve the current workforce pipeline for the benefit of future workforce requirements and delivery of ADF capability.

Skilled Migration is an additional input into future workforces where genuine skills shortages exist. The Government's Temporary Skills Shortage (TSS) Visa is designed to target genuine skill shortages without displacing Australian workers. A Labour Agreement stream in the TSS Visa program exists for exceptional cases where standard visa programs are not available and there is a demonstrated need that cannot be met in the Australian labour market.



Defence Industry Skilling & STEM Strategy



A living approach to supporting the skills needs of defence industry.

This Strategy focuses on the decade to 2028-29, and aims to support industry in accessing the skilled workers that will be required to deliver the capability required by the ADF.

The Strategy is part of the Government's broader suite of defence industry policy, which aims to strengthen the Defence and industry partnership, and support the delivery of the Defence capabilities which are necessary to achieve the objectives of the 2016 Defence White Paper, the Defence Industry Policy Statement, and deliver the Integrated Investment Program.

In developing the Strategy, Defence considered how a large number of macro-level policies are already being applied to achieve whole-of-Government solutions to support the skills of all Australian industry workforces. This Strategy provides a framework for an enhanced approach to support, specifically aimed at the defence industry workforce.

At its centre, the Strategy recognises the need for improved and continued collaboration and coordination across government and industry to address the current challenges to Engage, Attract, Train and Retain a capable workforce.

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An Enhanced Approach to Skilling

The Strategy recognises the need for improved and continual cooperation, collaboration and coordination across Government and industry to achieve a sustainable and skilled workforce.

To deliver a defence industry with the workforce capacity and capability to meet Defence's needs, a multi-faceted approach must be taken. For example, the motivation to pursue and complete STEM studies is a decision made at the individual level, while the ability for a business to grow and sustain its workforce focuses on the need for incentive, assistance and collaboration at the industry level. In consultation with industry and, cognisant of the challenges to developing a robust and resilient workforce capability, this Strategy focuses on four target areas.



1. ENGAGE

This focus area targets at the individual level, through improving access to information about defence industry and career opportunities with the objective of promoting growth in the volume of workers joining defence industry through improved or more accessible pathways. This focus area also supports the national effort to improve the take up of STEM studies and careers.



2. ATTRACT

This focus area supports defence industry to grow and sustain a national defence industry workforce, with the objective of leveraging the existing, or soon-to-be, workforce pool.



3. TRAIN AND RETAIN

This focus area seeks to work with defence industry to address capacity and capability gaps in the existing defence industry workforce with the objective of enhancing existing capability.



4. COLLABORATE

This focus area seeks to improve the cooperation, coordination and collaboration across all stakeholders to identify trends, align objectives and optimise the use of funding. This will help ensure the future supply of skilled workers.

ENGAGE

Improve access to information about defence industry for individuals and support the national effort to improve the take up of STEM studies and careers.

Supporting Programs:

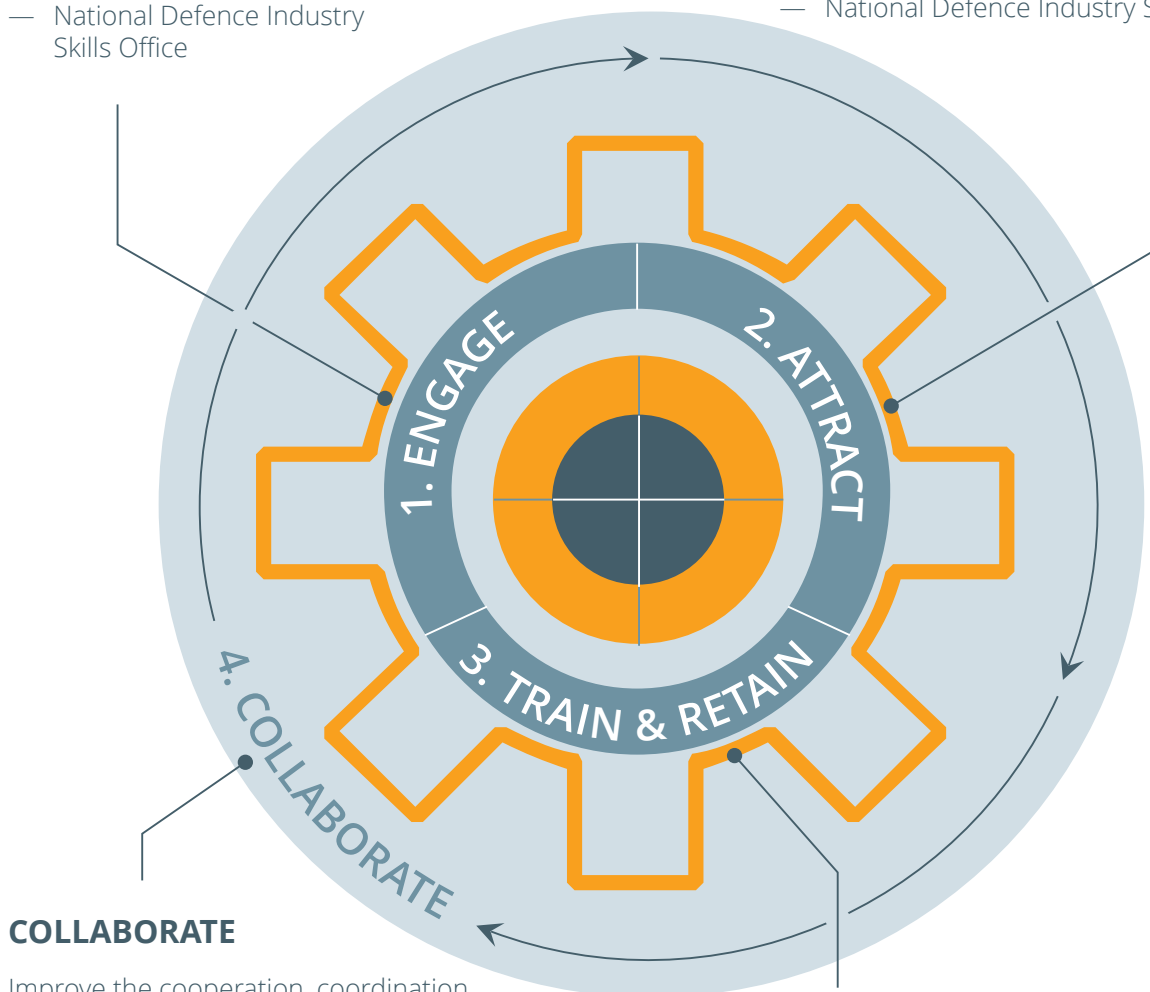
- Defence Industry Internship Program
- Web/Media
- Schools Pathways Program
- Myskills
- National Defence Industry Skills Office

ATTRACT

Support defence industry businesses to grow and sustain a national defence industry workforce with the required skills.

Supporting Programs:

- Defence Industry Internship Program
- Referral of unutilised Defence candidates and transitioning ADF to industry
- Jobactive
- National Defence Industry Skills Office



COLLABORATE

Improve the cooperation, coordination and collaboration across all stakeholders to identify trends, align objectives and optimise the use of funding.

Supporting Programs:

- National Defence Industry Skills Office

TRAIN AND RETAIN

Help address capacity and capability gaps in the current workforce.

Supporting Programs:

- Centre for Defence Industry Capability
- National Defence Industry Skills Office

Industry and Defence have a solid foundation of cooperation and collaboration across these areas, however, more can be done. Greater coordination would allow for more targeted engagement, attraction, and training activity to support the defence industry workforce of today and support the workforce development pipeline for the future.

Engage



The objectives of this focus area of the Strategy are:

1. Support the national effort to improve the take up of STEM studies and careers
2. Improve diversity in defence industry
3. Raise awareness of defence industry as a sector of choice
4. Improve access to information about defence industry and defence industry careers for individuals

The capability of the ADF must be at the leading edge. To remain there, Defence and defence industry will increasingly rely on a diverse workforce, of people with STEM skills.

The Defence Industry Skills Survey found that 26% of SMEs and 33% of larger businesses responded that efforts to grow their business are being constrained by a shortage of appropriately skilled candidates.

It is essential that our schools and tertiary institutions support Australian children and young people to develop their STEM skills, so that there is a strong future workforce able to meet the challenges of rapidly changing technology. Industry and education providers will need to work together to ensure this future workforce is aware of the range of career opportunities available in defence industry. Complemented by support through dedicated programs, this will help ensure greater numbers go on to achieve fulfilling careers in defence industry.

Defence industry will need to be inclusive to maximise access to all the available Australian talent. Embracing a more diverse workforce increases the talent pool from which defence industry can draw, and presents opportunities for diversity of thought and innovation. Working now to help increase the number of women, and individuals from diverse and disadvantaged backgrounds, will help increase the talent pool of the future.

What are we doing?

Naval Shipbuilding College

The Naval Shipbuilding College (the College) provides community engagement and services to build awareness of naval shipbuilding as an ongoing career of choice. The College communicates this message in accordance with its annual communication plan, which involves digital media, career expos, conferences, and other Industry events. The College is engaging with existing STEM initiatives and developing new initiatives at the high school level to attract young people to the industry.

Schools Pathways Program

The Schools Pathways Program (the Program) aims to inform young Australians about the varied pathways and career opportunities within the defence industry sector. The Program facilitates an understanding of defence industry and provides access to defence industry career experiences. The Program also provides access to mentoring and networking opportunities, and encourages student participation in STEM activities and/or subjects that will lead to an increase in the pool of young people with the knowledge and skills to pursue defence industry careers.

The Program, which has been running since 2009-10, has been instrumental in increasing student understanding of defence industry careers and pathways and has been a major contributor to increasing STEM participation in the schools that are actively engaged in the program.

In the Hunter region of New South Wales, for example:

- The program is delivered in 50 secondary Hunter schools;
- Engages 59 industry partners, 21 of which are defence industry;
- Provides tailored work experience opportunities in defence industry for bright and enthusiastic students;
- Is providing funding to 41 secondary schools to facilitate STEM opportunities with defence industry relevance; STEM education equipment and participation in STEM challenges and competitions;
- Encourages female participation in activities and initiatives via various affirmative action measures; and
- Provides a clear pathway for STEM-educated students into the Hunter defence industry sector.



Case study

Schools Pathways Program – STEM-EX

Funded through the Schools Pathway Program, STEM-Ex was established in the Hunter region of NSW to guide selected students into defence industry.

Students are exposed to ‘real’ workplaces – embedding them in project teams. In 2018, the program connected 35 Hunter students in years 11 and 12 with Defence prime contractors. A notable example was Boeing Defence Australia, where students were placed with the Wedgetail In-Service Support team and the FA-18 Classic Hornet Sustainment Support team at RAAF Base Williamtown.

Industry partners, which include BAE Systems, Boeing Defence Australia and Obelisk Systems, are critical to the success of STEM-Ex.

The Program presents a unique opportunity to engage students and inspire them to pursue STEM based careers.



Case study

Schools Pathways Program – iSTEM

iSTEM has been created in partnership with RDA Hunter’s ME Program. iSTEM is a state-of-the-art Stage 5 school subject, incorporating:

- mechatronics
- aerodynamics
- engineering
- 3D CAD/CAM
- Aerospace
- Motion modules

iSTEM aims to present maths and sciences to students in years 9 and 10 in a hands-on, project-based learning format. In close partnership with BAE Systems, Ampcontrol, Varley Group and other Hunter defence businesses, the iSTEM syllabus contextualises curriculum by posing ‘on-the-job’ scenarios for students to address.

Since its inception in the Hunter in 2013, iSTEM has gained School Developed Board Endorsed Course endorsement as well as approval from the NSW Education Standards Authority for inclusion on student academic records (in NSW). It was taught in 250 schools across NSW in 2018 and is available to all NSW high schools.

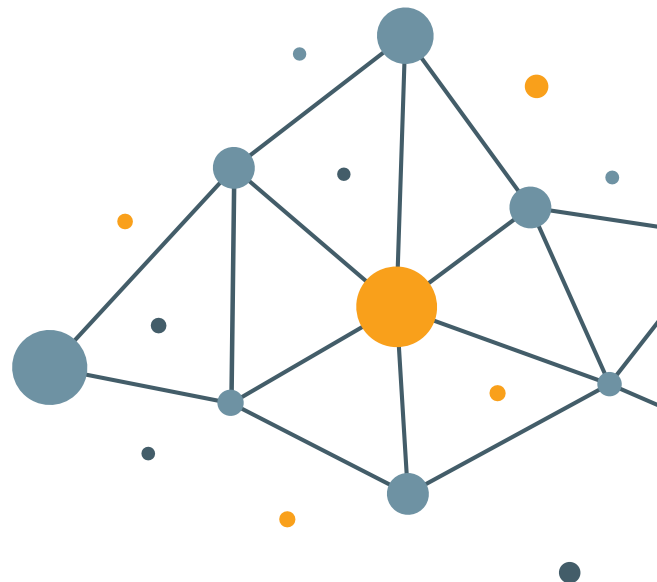


Case study

Schools Pathways Program – Teacher in Residence program

The Teacher in Residence program is a partnership between the Schools Pathways Program in South Australia (known locally as the Advanced Technology Project), Flinders University, University of South Australia, University of Adelaide, TafeSA and associated industries.

The Schools Pathways Program builds awareness of real world applications and careers by providing a placement for teachers with tertiary researchers, academics and industry in specific STEM areas of interest. Through the placement, teachers learn about the latest research, equipment and industry trends via work shadowing, mentoring and meeting with university staff. This relationship supports teachers developing curricula and content delivery that engages students to transition to post school STEM and defence industry pathways.





Case study

Schools Pathways Program – STEM Workforce Initiative

RDA Hunter's STEM Workforce Initiative delivers life-stage specific, education programs that provide a pipeline of industry-focused activities for primary to senior school students and those transitioning to higher education and jobs. Sam Hadley became Australia's first Certificate III in Aviation (Remote Pilot-Visual Line of Sight) trainee following his participation in RDA Hunter's ME Program. Through the ME program, Sam enrolled in iSTEM in year 9 where he was introduced to the possibilities of working with drones as a career. iSTEM challenged Sam to solve real problems by applying science, technology, engineering and mathematics skills whilst undertaking problem-based learning.

Following completion of the iSTEM course, Sam joined RDA Hunter's STEMship program; a pre-employment program focusing on the development of STEM skills at a technical level. The Program is designed to bridge the gap between secondary and university STEM programs and align with industry policy at both State and Federal levels, with TAFE NSW providing and delivering an innovative nationally accredited skillset program.

UVAIR hosted Sam for the 15-week program, during which time he tested, designed, developed prototypes, constructed componentry and flew drones that are used in industrial applications across the country. He contributed to workplace outcomes and quickly became an invaluable part of the UVAIR team. At the end of the 15 weeks, Sam was offered the first traineeship in Australian UAV industry history, with drone deployment company Airsight Australia.

Industry is enjoying the benefits of the RDA Hunter's STEM initiatives, underscored by increasing participation year-to-year. The Program is now recognised as a valuable source of suitable, job-ready personnel, and is a key component of the Hunter Region's workforce development strategy.

Improving public knowledge

The career aspirations and expectations of the younger workforce are different to previous generations. The defence sector needs to be presented in a way that reaches this new generation of workers and appeals to young people, parents, careers advisors and teachers, to help increase the number and diversity of those coming into the sector.

The Government's Australian Defence Industry Skills and Jobs Information Campaign, the 'Workforce Behind the Defence Force', was the first step in building national awareness of career opportunities in defence industry. Promoting defence industry careers has a twofold impact, the most obvious of which is to attract individuals with appropriate skills into defence industry. The second-order impact is to inspire young people to continue studying subjects, especially STEM, which can improve their ability to have a career in defence industry.

Widening the channels for job seekers

Information and services are available, to young people and transitioning workers, about careers in defence industry. Those who have positively responded to the information campaign, or other outreach activities, are able to easily access more information at www.defenceindustry.gov.au.

Currently, the defence industry website provides information on defence industry, career and study options, and business opportunities. This includes video case studies of young people working in defence industry to help raise awareness among young Australians and the general public about the diverse and interesting careers in the sector.

Defence will enhance the www.defenceindustry.gov.au website as a central information point for individuals businesses and the education sector to access information and resources to support the activities under this focus area.

The updated site will provide clear entry points for students, job seekers and businesses. It will provide up-to-date, relevant information about Defence's skills support activities, as well as information and resources from other organisations, including Government agencies.

My Skills

Defence, in collaboration with the Department of Education, will continue to enhance the defence industry related information available on MySkills, the Government initiative which assists individuals and employers to choose the training provider that best suits their needs. MySkills.gov.au features all publicly-available, nationally-recognised vocational education and training in Australia.



Attract

The objectives of this focus area of the Strategy are:

1. Facilitate connections between individuals and prospective employers
2. Support defence industry businesses to grow the national defence industry workforce

The defence sector requires a workforce with a range of skills developed through universities and other higher education providers. Even after young people have made a decision about further STEM study, extra support may be needed to translate study into a relevant job outcome.

Students who are undertaking relevant tertiary studies in STEM subjects are a key source of skilled employees for defence industry. However, Defence's consultations with businesses indicated that, while students are graduating with theoretical and technical skills, many lack general workplace skills like professional communication or time management. These are often referred to as 'enterprise skills.'

These skills are built over time and universities are improving their strategies to drive employability through work integrated learning models. However, there are further opportunities to help students through greater and broader collaboration between universities and industry. Students can be engaged during studies through internships, cadetships and apprenticeships to provide work experience and job-ready learning.

Students and recent graduates are not the only source of new talent for defence industry. There is a pool of people with an existing association with defence who may be attractive to industry due to their level of experience. This includes:

- Unsuccessful ADF applicants
- Cadets
- Reservists
- Transitioning ADF personnel
- ADF Veterans

There is also opportunity to harness skilled workers who have been away from work, or away from a particular type of work, and who wish to return. An opportunity exists to capture more experienced engineers through focused effort on 'returners' and by creating more flexible workplace environments. This requires support of industry to review the quality of working environments to support a diverse workforce.

What are we doing?

The Defence Industry Internship Program

The Defence Industry Internship Program (DIIP) links 3rd and 4th year engineering students with defence sector SMEs by sponsoring the industry placement component of their studies.

The program specifically targets engineering streams that are considered by defence industry to be in short or critical supply, and aims to give student engineers a better understanding of the critical work performed by our defence SMEs. Defence has expanded the program to include an additional twenty places in FY 2019-20, taking the total to 50 places for aspiring engineers. Defence is also examining how the program may need to support other skills streams relevant to defence industry and defence capability needs in the future.

Naval Shipbuilding College

The Naval Shipbuilding College is operating a Workforce Register, which draws on the College's communication and other workforce planning services to establish a database of individuals with interest, skills and capabilities relevant to naval shipbuilding, sustainment and supply chain industry. Through the Workforce Register, the College engages with candidates to identify an individual's ability and current skill levels, and matches people to relevant education and training opportunities and, where available, employment opportunities.

ADF Transitions

Information about defence industry opportunities is provided to ADF members once they begin making enquiries about transitioning to civilian life. The ADF as a whole, as well as individual services, provide a broad set of services to transitioning, full-time members of the ADF. These can include exploring part-time and Reserve options.

In particular, the new ADF Transition Seminar format provides an excellent opportunity to inform members and their families about defence industry opportunities. This program helps ensure that the skills and expertise that Defence has invested in developing for ADF members is retained in some capacity, and helps to grow Australia's defence industry.



Train and Retain

The objectives of this focus area of the Strategy are:

1. Encourage business investment in skills and stimulating lifelong learning
2. Financial support for businesses and their employees to upskill
3. Help businesses develop workforce capabilities in new areas

Rapid changes in technology and the nature of work mean that individuals will need regular upskilling throughout their working lives. Employers need to plan to upskill existing workers and themselves to take advantage of growth opportunities and adapt to changing skills needs.

Specifically, defence industry SMEs have a variety of difficulties and barriers in upskilling their workforce, including:

- budgeting and planning for employee training or upskilling in the absence of assured work but in anticipation of Defence's need;
- concern that deferring training may make businesses less competitive in winning defence work;
- concern about the return on investment if upskilled employees are not retained in the business; and
- SME owners and managers find it difficult to find time to improve their own skills through ongoing training, yet acknowledged that management capability is fundamental to their business success.

SMEs face particular barriers which are in addition to larger businesses whom can more easily achieve economies of scale when accessing the services of external training providers.

The Defence Industry Skilling Survey found that 56.9% of survey respondents said that they were increasing employee training and development to attract and retain staff.

What are we doing?

Capability Improvement Grants

The Centre for Defence Industry Capability (CDIC) was launched in December 2016 its mission is to work with industry and Defence to build a world-class, globally competitive and sustainable Australian industry as a fundamental input to defence capability. The CDIC partners with industry, Defence, and state and territory governments to combine knowledge and networks towards this goal.

CDIC advisory services help businesses to understand the defence marketplace, improve their business capabilities and be better positioned to succeed as a supplier within a defence supply chain. Following an advisory engagement, a business is given recommendations to address capability gaps in their business, and may be eligible for support through a Capability Improvement Grant. The grant enables them to obtain reimbursement for up to half the cost of engaging a consultant or expert to implement eligible recommendations and may include undertaking skills development training.

Consultations with defence industry indicated that the eligibility requirements, applications process and dispensation of grants should be further tailored to current industry needs. Specifically, the current grant arrangements require a business to go through an advisory service before being eligible. While many firms appreciated the value of advisory services to help address the specific skills and capabilities required by a business, others also identified the need for more flexible access to skilling support. Defence recognises that different businesses require different levels of support, and not all SMEs require the full CDIC services for particular skills needs.

Defence will work with CDIC to refocus the current skill offerings to increase awareness of how CDIC business advisory services and grants can help SMEs improve their business capability, and will improve accessibility to financial support for skilling. This includes the re-establishment of a dedicated skilling program to support to Australia's defence industry, to target the greatest training needs linked to defence capability. Defence's previous dedicated industry skilling program was the Skilling Australia's Defence Industry (SADI) Program. In developing the updated program, Defence will look at supporting innovative approaches to the provision of training, as well as the more traditional ways of achieving accredited certifications.

This will provide greater flexibility and targeted options for SMEs, as they will be able to directly apply for discrete skilling support for training and skilling activities in trade, technical or professional skillsets; increasing the quality and quantity of skilled personnel available.



Case study CDIC

Prism Defence is an Adelaide business which specialises in ship-air integration and innovative solutions that support the development and management of ship-helicopter operating limits (SHOL). Prism has worked with eight international navies since it was founded in 2004.

In 2017, Prism contacted the Centre for Defence Industry Capability to seek help from a Defence business adviser. They worked with the CDIC to formulate a skills advisory report and applied for an \$11,000 grant to enhance the capabilities of our senior engineer and software developers.

“The funding allowed us to invest in a professional management course to help the senior engineer, who is also our general manager, to further develop his business management skills. We also invested in Agile software development courses to teach software engineers to apply lean principles to software development. Their upgraded skillsets have had an immediate impact, significantly benefiting our business.”

– Prism Defence

Defence Procurement Policy

Defence procurement policy can stimulate Australian industry participation in supply chains, job opportunities and investment solutions to meet sectoral skills needs. Larger businesses can also help create economies of scale for joint training opportunities, which individual supply chain partners may not be able to access individually. Alternatively, larger businesses can open internal training to supply chains.

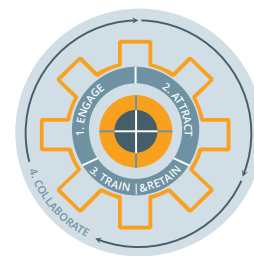
In this context, the Australian Industry Capability Program aims to create opportunities for Australian companies to compete on their merits for Defence work, on a value for money basis. Tenderers must describe how their proposed approach will enhance Australia's defence industry capability and capacity. The tenderers make commitments to involve and upskill Australian companies, including their own, to transfer technology and know-how, and to invest in the earlier stages of the skills cycle through activities such as research partnerships, apprenticeships and school-based programs.

These investments are currently determined on a project-by-project basis by tenderers to Defence. There is opportunity for Defence to provide better information to support these decisions and help identify opportunities for more integrated approaches to support sectoral skills needs. These efforts must be implemented in ways that don't reduce incentives for businesses to supply to Defence.



Photo © Commonwealth of Australia

Collaborate



The objectives of this focus area of the Strategy are:

1. Improve cooperation, coordination and collaboration across all stakeholders to identify trends and align efforts to maximise opportunities from separate investments
2. Review and improve programs to maintain relevance of skilling support to defence industry
3. Align efforts to help ensure access to the essential skills relating to the Sovereign Industrial Capability Priorities.

The defence sector's ability to meet future workforce foundational skills and training requirements is largely reliant on the performance of Australia's education and training systems, supplemented by Defence specific requirements. Commonwealth agencies, state and territory governments, educational institutions and training organisations, defence industry primes and SMEs, and major players in other industry sectors all have a role in building the skills of future and current workforces.

There is a need for greater stakeholder coordination to improve longer-term workforce planning and intelligence; to better predict and address future workforce needs; to examine relevant sectoral, economic, regional and skilling trends; and to facilitate quicker responses to defence industry workforce needs from key stakeholders. Greater collaboration will rely heavily on industry having a leading role in identifying skills demand and emerging issues. This will help governments, the education and training sector, and industry support organisations to coordinate and facilitate the supply of relevant programs and skills support.

Government, educators and business leaders will need to continue to work together to drive Australia's defence industry skilling and STEM outcomes. Greater coordination will help avoid duplication of effort, and better use of data in the policy design stage will inform evidence-based decision making and ensure more effective responses.

Improved collaboration and coordination, and the resultant lack of duplication, will ensure that the resources required by industry are able to be attracted, retained and engaged at a rate, complementary to Defence's rhythm.

What are we doing?

National Defence Industry Skills Office

Defence will streamline governance and policy for defence industry skills issues into the NDISO. The NDISO will engage with stakeholders, individually and collectively, including states and territories, industry, and the education and training sector, with the goal of helping to create a common picture of defence industry skills needs and risks.

The NDISO will also examine cross-sectoral collaboration and information sharing to put defence industry's skills concerns in a national context. This will assist Defence to leverage opportunities for collective action to meet defence industry skills needs and support the broader national STEM pool.

The NDISO will work with other areas of Defence that have responsibility for STEM or skilling initiatives through the recently-established Defence STEM Council to ensure internal alignment with Defence's own workforce development activities. This alignment is particularly important for Defence's National Naval Shipbuilding Office, which has responsibility for the NSC.

The NDISO will act as a single point of contact within the Department of Defence for industry skilling and STEM-related engagement and leadership. NDISO's mandate will cover a variety of functions, including:

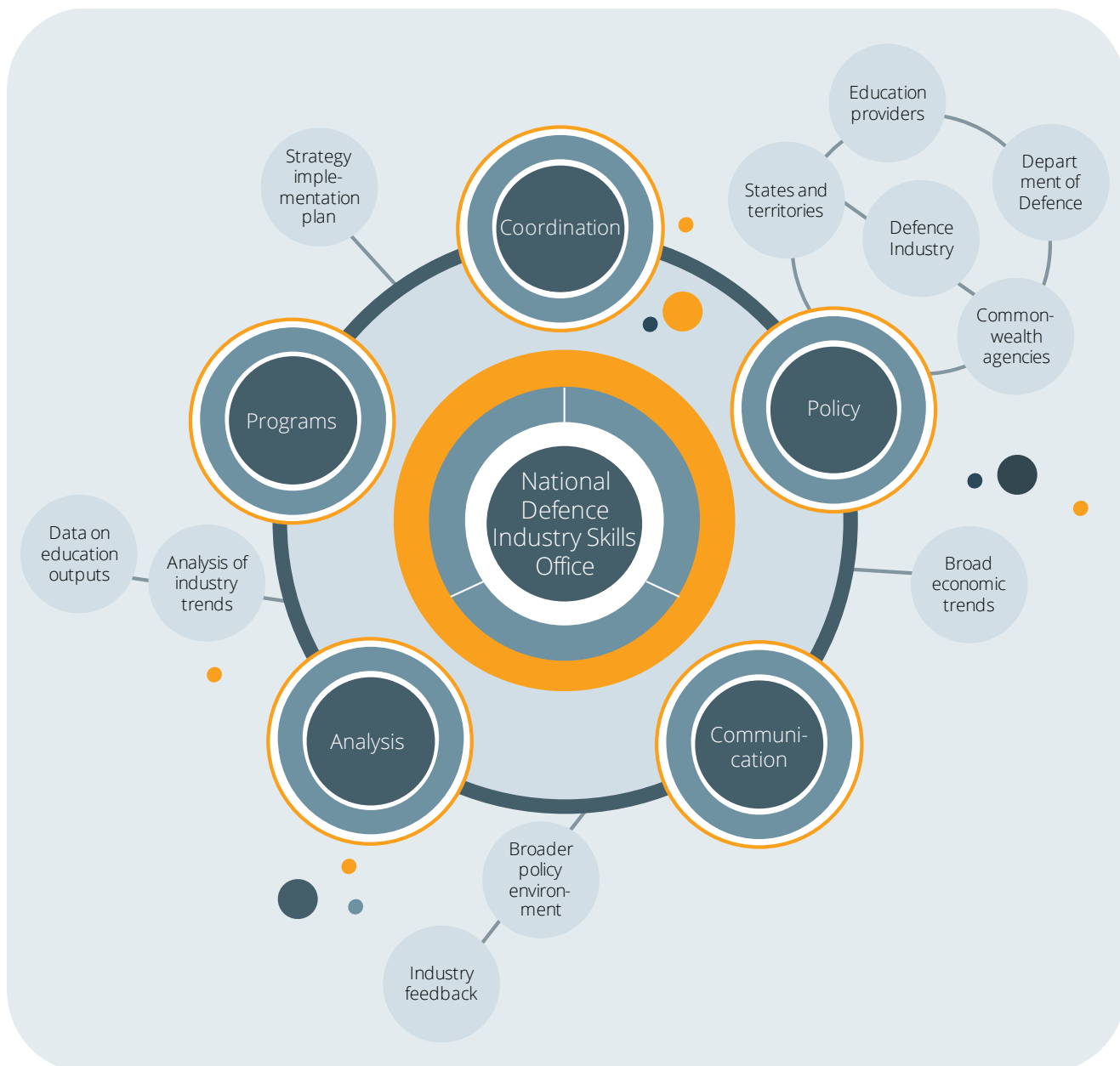
Policy: Implementation and review of Departmental policy on defence industry STEM and Skilling issues, including advice to Government.

Programs: Management of STEM programs for defence industry, such as the DIIP. The NDISO will work closely with the CDIC and the National Naval Shipbuilding Office in delivering defence industry skills outcomes.

Coordination: Coordination and consultation with internal (Defence) and external stakeholders to establish ongoing relationships. Regular contact will facilitate information-sharing and help to develop collective responses to challenges.

Communication: Effective information dissemination to enable informed choices by Australian individuals and businesses. Up-to-date information should be accessible online, and Defence will continue public engagement at events, such as careers expos.

Analysis: Establishing and updating the evidence base around which policy and programs are covered. Includes analysis of program reporting, data collection and analysis, and research into workforce/sectoral trends.



Naval Shipbuilding College

The College is working with Primes and Industry stakeholders to refine workforce modelling and to build an understanding of the naval shipbuilding enterprise's workforce requirements. To ensure that education and training providers can effectively respond to this demand, the College is working with institutions to align courses with industry requirements. Through this, the College is establishing a national network of endorsed providers.

Improve access to information about defence industry security requirements

Sensitive and emerging technologies are critical to Defence's capability edge. When partnering with Defence, business and individuals secure these capabilities through Defence Industry Security Program (DISP) membership and security clearance vetting respectively. While DISP membership and security clearance vetting are not skilling issues, they are important considerations in workforce planning, project scheduling and delivery.

To better support industry, Defence has made reforms to DISP that will improve businesses access to security services, including their ability to manage their own security cleared workforce needs. To facilitate informed decision-making, the Australian Government Security Vetting Agency website has clear information on security clearance eligibility, suitability, timeframes and costs associated with security clearance vetting.

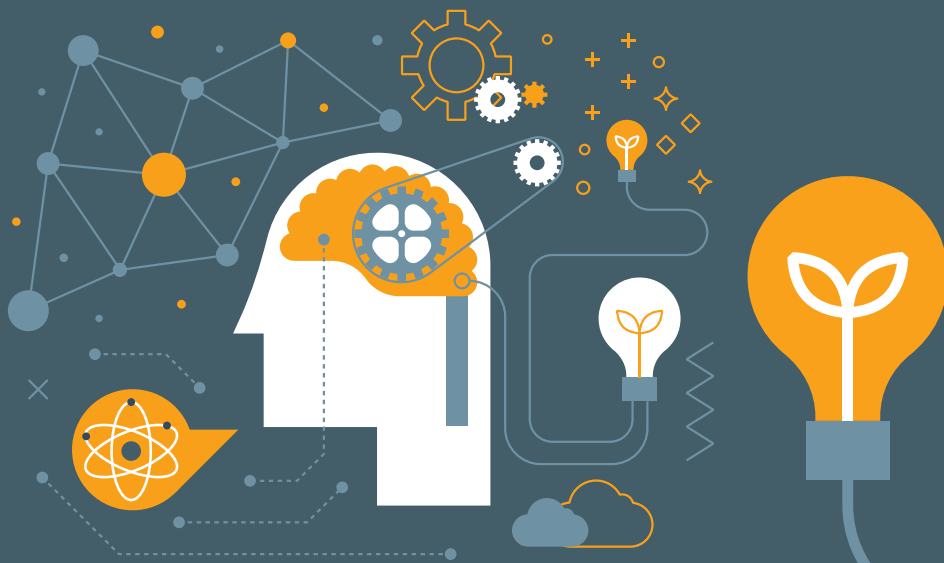


Retaining skilled people within the defence sector and supporting mobility between the ADF, APS and industry where appropriate are key outcomes for the Defence Industry STEM & Skilling Strategy.

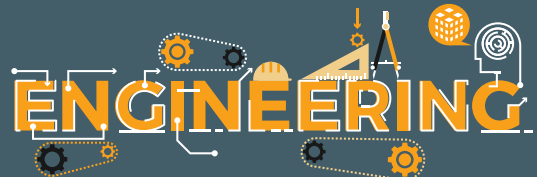
Delivering Results

In the first 12 months following the release of this Strategy, Defence will:

-  Establish the National Defence Industry Skills Office
-  Host a national stakeholder summit on the subject of defence industry STEM and Skilling to commence engagement
-  Implement modified grant guidelines for the CDIC's skills support grants to improve accessibility of funds for individualised training
-  Develop a horizon-scanning methodology for periodically reviewing NDISO's priority activities, with a focus on data analysis and evidence base
-  Update the www.defenceindustry.gov.au website to improve the quality and accessibility of information for stakeholders and interested parties
-  Undertake consultations with stakeholders to investigate ways forward on longer-term projects for the Strategy
-  Engage with, and encourage connections between, stakeholders to share information and best practice



APPENDICES



A woman with long brown hair, wearing a dark blue polo shirt with 'DSTO' on the sleeve, is working on a large, complex aircraft engine. She is holding a white clipboard and looking towards the camera. The engine is mounted on a test cell with blue acoustic foam walls. The background is dark and industrial.

Key Considerations

Key considerations informing the components of the Defence Industry Skilling and STEM Strategy are included in detail below:



What is Australia's Defence Industry?

Australia's defence industry is made up of thousands of businesses of varying size and capability across multiple industry sectors, including manufacturing, information technology, research and development and contract management.

A Defence survey conducted for the development of the 2018 Defence Industrial Capability Plan revealed that less than 5% of Australian businesses who self-identified as 'defence industry' were 100% dedicated to defence business.

Australia's defence industry businesses can be divided into two main categories:

- Primes are typically Australian subsidiaries of large global defence firms, who are often the leading or "prime" contractor on Defence contracts, especially for major capital acquisition projects.
- SMEs are officially described as those with fewer than 200 employees. Defence industry SMEs can contract directly to Defence for services such as maintenance; they can provide professional consulting services; or they can produce sub-systems and components within Primes' supply chains.

Most defence industry businesses – around 75% – dedicate less than 25% of their workload to defence-related contracts. It is a complex space with many competing interests.

Due to the breadth of industries that intersect with defence industry, it can be difficult to define; it is not usually examined separately from the workforce of these other industry sectors in broader statistical data.



Engage and inspire to support the national effort to improve the take up of STEM studies and careers

Many countries worldwide have shared challenges around the number of STEM skilled graduates coming through their education systems. The pipeline from study to work presents numerous decision points for individuals.

A student's decision to pursue a STEM career is influenced by their perceptions formed through a range of factors including their experiences in school, exposure to information, social factors and family influence.

While there is no single solution, a number of elements can contribute to the change required across our nation to build our STEM capability. One important way to help is to better equip and support teachers to educate, engage and inspire their students in STEM subjects.

Inspiring young people to study STEM needs to be paired with career pathway awareness. Helping secondary students to understand the kinds of careers available supports them to make choices that help them to undertake STEM related tertiary studies and careers.

In the current education system, students may opt out of pursuing further studies or STEM subjects due to concerns about the impacts of poor test results on Australian Tertiary Admission Rank (ATAR) scores and options for further education. Opting out of STEM studies early makes it more difficult to return to STEM subjects later in life, either for work or further study.

Perceptions of university and vocational education and training (VET) can also have an impact on career options. During consultations, some industry stakeholders made a case that VET is undervalued in Australia. VET technical graduates have a high focus on STEM subjects, particularly engineering, and tend to receive practical, hands-on experience more quickly.

Industry representatives said that employees who begin their engineering or technical careers with VET qualifications, and go on to complete university qualifications are highly valued in the defence sector.



Identifying the experience gap

Data from the Department of Education and Training's uCube database indicates that the proportion of Australian domestic tertiary students completing STEM-related degrees has stayed roughly constant at around 18-20% since 2006. Meanwhile, the total number of university students has increased. The net result is that the number of STEM-skilled graduates is likely increasing.

Defence's survey and consultations suggested that industry is perceiving a shortage of STEM-skilled graduates, including university graduates. However, engineering degree completions increased year-on-year between 2008 and 2018 and in 2017-18, employers seeking to hire engineers received, on average, 19.3 'qualified applications' per vacancy (Department of Jobs and Small Business, *Engineering Professions Australia 2017-18*). More than 80% of 'qualified applicants' were found unsuitable, mostly due to a lack of experience or a lack of enterprise/employability skills required to do the job.

This suggests that there may currently be a divergence between education outcomes and job requirements. Industry, governments, and education providers are working to improve this situation, but solutions take time to implement. Industry has identified that there is some risk inherent in investing in training for new staff, particularly in a competitive skills environment. Defence is seeking to make grant funding for training activities more accessible to industry in order to reduce the impacts of such risks.

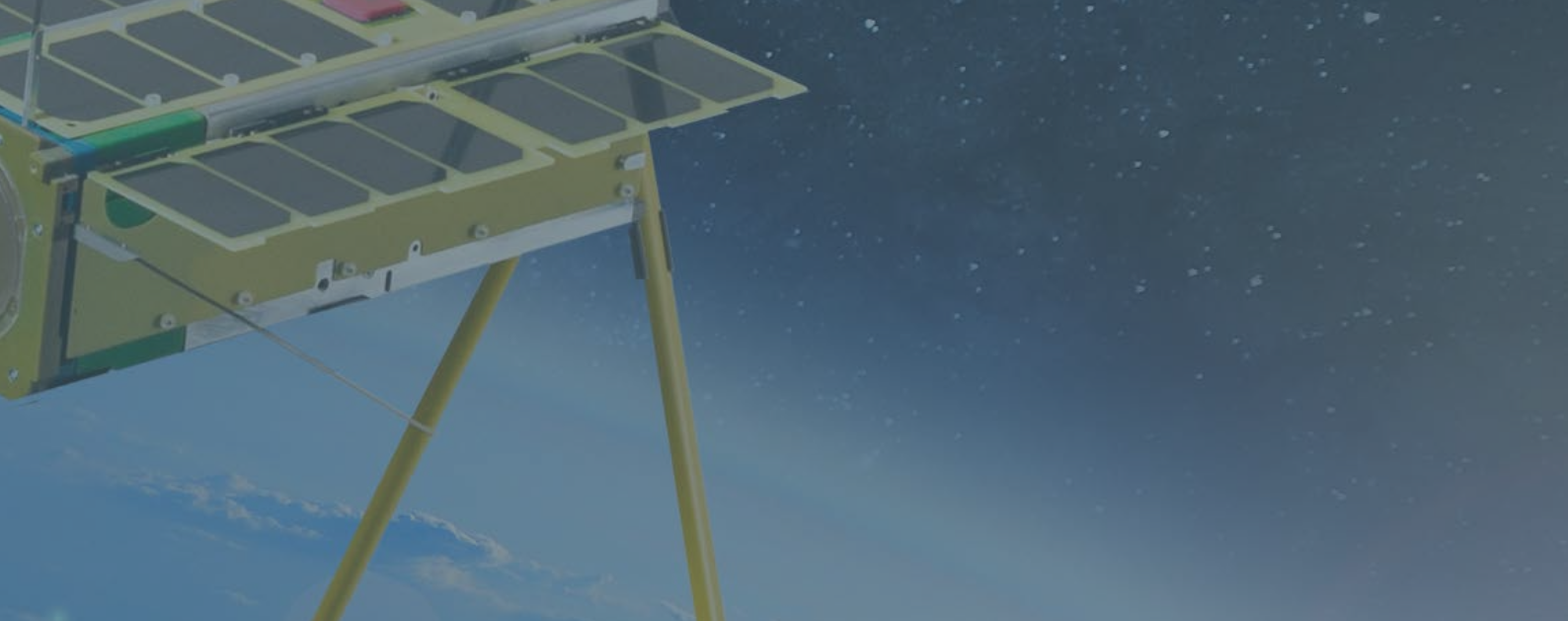


Help improve diversity in defence industry

Businesses face barriers which can limit the diversity outcomes they achieve. The number of women coming out of tertiary education is exceeding men in Australia, yet the employment outcomes differ for women and men. Graduate gender pay gaps still favour men in most fields of study in Australia (Workplace Gender Equality Agency).

Women are represented more in certain occupations such as health and education while more men study engineering and information technology. Helping to change the perceptions that lead to these trends and help attract more women to material sciences, engineering and other underrepresented occupations, will help to address the imbalance in gender representation.

Defence industry companies should work to become as inclusive as possible to maximise attraction of available talent. Embracing a more diverse workforce increases the talent pool from which the defence industry can draw and presents opportunities for diversity of thought and innovation.



Raise awareness of defence industry as a sector of choice

A key theme that emerged during Defence's consultations was raising awareness of careers in defence industry. This is critical to increasing the pool of skilled workers available to Australian industry. More can be done to help attract new workers by improving the Australian public's knowledge of Australia's defence industry and the career opportunities arising from the Government's investment in renewing Defence's capability.

The Government's Australian Defence Industry Skills and Jobs Information Campaign, the 'Workforce Behind the Defence Force', was the first step in building national awareness of career opportunities in defence industry.

While the campaign formally ended in June 2018, the branding is enduring.


Defence will continue to build on the awareness of defence industry careers generated through 'Workforce Behind the Defence Force' campaign.



The Naval Shipbuilding College and associated initiatives

Government has established the NSC to support the development of a skilled and capable workforce for the national naval shipbuilding enterprise through a hub-and-spoke model – particularly during the early stages of the enterprise. As the enterprise matures, Government will consider the future role, model and approaches of the NSC in the context of other workforce development approaches utilised by the enterprise, including the contribution from the national education and training system to address any gaps which may emerge. The NSC is the targeted initiative to ensure that the right workers with the right skills are in place to deliver the \$90 billion continuous naval shipbuilding program.

The College will work with the selected Primes to deliver workforce planning services, and enhance models of labour demand and supply. Defence will work to ensure that the initiatives outlined in this Strategy support the Government's policy initiatives and strategic workforce planning for the naval shipbuilding sector.



Defence Support for Skilling and STEM

Skilling Australia's Defence Industry program

The former Skilling Australia's Defence Industry (SADI) program was established in 2005 to grow the skills base of Australia's defence industry. Over the life of the SADI program, funding was provided to around 200 defence suppliers.

The SADI program closed to applications in 2016 as advisory and facilitation services are now available through the CDIC to help SMEs improve their business capabilities and to help them take advantage of development opportunities within the defence sector. Through the advisory services, eligible SMEs can access capability Improvement Grants to help offset the costs of training or up-skilling staff in areas that support defence capability outcomes. CDIC business advisory services and grants can assist SMEs in identifying their skills needs, and support them in satisfying those needs on a company by company basis.

Photo © Commonwealth of Australia

Examples of Defence's STEM outreach activities

Defence's STEM program covers a wide variety of activities, such as: promoting STEM related employment roles to school children; work experience; scholarships for technical trades; cadetships and graduate programs; training initiatives and specific industry support programs aimed at improving STEM skills; and career learning and development for STEM occupations.

Partnerships with academic institutions, Industry and other Government Departments provide opportunities to further enhance STEM skills. Where required, Defence also uses targeted retention measures to encourage people with highly valued STEM skills to remain in Defence.

While these initiatives are primarily aimed at ensuring that Defence and defence industry have the skilled workforce they need and they also have a positive impact in promoting STEM employment in the broader Australian population.

Some examples include:

Defence Civilian Undergraduate Sponsorship

www.defence.gov.au/dmo/careers/studentsandgraduates/undergraduatesponsorship/

The Department of Defence sponsors successful applicants to study either a:

Bachelor of Engineering (Mechanical, Electrical, Aeronautical or Civil); or a

Bachelor of Computing and Cyber Security at the University of New South Wales Canberra campus.

Successful applicants have their tuition fees paid for by the Department of Defence, can participate in paid work placements, and apply in their final year for a job through the Department of Defence Graduate Program.

DSTG Undergraduate Scholarship Program for Female Students

www.dst.defence.gov.au/partnership/undergraduate-scholarship-program-female-students

Defence Science and Technology Group offers scholarships for female undergraduate students studying science, technology, engineering or mathematics degrees. Scholarships are currently offered for students at the Australian National University, University of New South Wales, and University of Adelaide.

AIR4 – Role models in STEM

www.air4.com.au

A joint effort between Defence Science and Technology Group and the Royal Australian Air Force to inspire the next generation of STEM students through aerospace-themed outreach activities.

The AIR4 Life event, hosted in November 2018, aimed to inspire girls aged 10-16 years to engage with STEM subject matter and learn ways to reduce the gender gap in STEM.

Defence Work Experience Program

www.defence.gov.au/WorkExperience

The Department of Defence, including the Australian Defence Force, offers a variety of work experience opportunities for students located across Australia. Placements include: Air Traffic Control, Women in Defence (Tri-Service), Research Science, Army Aviation and Marine Engineering. These work placements allow students to get first-hand experience of life in the Defence Force or Defence civilian workforce.

Science in Australia Gender Equity (SAGE) - Athena Scientific Women's Academic Network pilot

www.sciencegenderequity.org.au

Launched in June 2016, the Athena SWAN pilot establishes a charter and accreditation framework for scientific institutions with a goal of cultural change toward improving gender equity and diversity in Australian science. Defence Science and Technology Group is one of dozens of scientific institutions that have signed on as charter members of Athena SWAN.

Examples of Commonwealth STEM and Skilling Activities

The National Innovation and Science Agenda (NISA)

Sets a focus on science, research and innovation as long-term drivers of economic prosperity, jobs and growth. The Minister announced the NISA on 7 December 2015, committing \$1.1 billion over four years to 24 measures. The NISA complements a broader government investment in science, research and innovation.


National Career Education Strategy

Future Ready: A student focused National Career Education Strategy to improve career education in schools by:

- building teacher and school leader capability
- supporting parents and carers in their important role in these conversations
- encouraging collaboration between industry and schools.

<https://www.education.gov.au/national-career-education-strategy>





Examples of State and Territory Skilling, STEM and Defence Industry Strategies

State and territory governments are seeking to maximise the participation of their workforces, educational institutions and industrial bases in Defence business. Many have developed defence workforce strategies which highlight their individual competitive advantage and actions, and how these can or will support Defence capability.

NORTHERN TERRITORY

Northern Territory Defence and National Security Strategy 2018

business.nt.gov.au/_data/assets/pdf_file/0008/476576/defence-national-security-strategy.pdf

Outlines an intent to ensure that businesses continue to have access to a flexible and skilled workforce that meets the current and future requirements of Defence, national security agencies, prime contractors and major subcontractors in the Northern Territory.

STEM in the Territory 2018-2022

education.nt.gov.au/education/support-for-teachers/stem-in-the-territory-strategy-2018-2022

Aims to guide and support schools to prepare students for lifelong learning supported by quality STEM education opportunities.

WESTERN AUSTRALIA

Western Australian Defence and Defence Industries Strategic Plan

https://www.jtsi.wa.gov.au/docs/default-source/default-document-library/western-australian-defence-and-defence-industries-strategic-plan.pdf?sfvrsn=ee45721c_4

Western Australia will undertake a Defence Workforce Development Plan to ensure the workforce and skilling needs for the Western Australian defence sector are anticipated and met with a focus on enhanced consultation, planning and coordination.

Future Jobs, Future Skills

www.jtsi.wa.gov.au/what-we-do/science-and-innovation/science-and-innovation-overview/future-jobs-future-skills

Seeks to improve state-wide STEM uptake and skills, through efforts such as supporting teachers to attend professional learning activities, increase uptake of STEM subjects through a state-wide STEM campaign, and enhance access to digital technology learning programs.

COUNCIL OF AUSTRALIAN GOVERNMENTS

National STEM School Education Strategy

www.educationcouncil.edu.au/EC-Reports-and-Publications.aspx

Aims to better coordinate and target this effort and sharpen the focus on the key areas where collaborative action will deliver improvements to STEM education standards for all Australians.

QUEENSLAND

The Queensland Defence Industries 10-Year Roadmap and Action Plan

<http://www.defenceindustries.qld.gov.au/about-us-di/q/our-strategies.html>

The Queensland Defence Industries 10-Year Roadmap and Action Plan has a focus on growing defence industry capability.

Schools of the Future

<http://advancingeducation.qld.gov.au/our-plan/Pages/Schools-of-the-future.aspx>

Aims to lift participation of students including girls and Aboriginal and Torres Strait Islander students.

NEW SOUTH WALES

New South Wales Defence and Industry Strategy

<https://www.industry.nsw.gov.au/defence-nsw/what-we-do/nsw-defence-and-industry-strategy>

The key strategy areas include to provide Defence and industry with their future workforce.

Teaching STEM

<stem-nsw.com.au/teaching-stem>

Guides teachers to engaging students through knowing their interests and targeting syllabus outcomes and designing a project that will engage them in STEM.

SOUTH AUSTRALIA

The Defence State – Strategy 2025

<https://www.defencesa.com/industry/workforce-devel/skilling-framework>

Sets the strategy to retain and up-skill existing workers and attract and re-skill workers transitioning from other sectors.

This commitment is underpinned by:

The industry-led Defence Industry South Australia Workforce Strategy 2014–2020 – South Australia's defence skills roadmap

A STEM Skills Strategy for South Australia – aims to lift the number and qualifications of people with skills in these areas.

STEM Learning Strategy

www.education.sa.gov.au/teaching/curriculum-and-teaching/stem-learning-strategy

Aims to build expertise in STEM teaching across all years of public education, engage students in STEM learning across all school levels.

VICTORIA

Defence Technologies Sector Strategy

<https://defence.vic.gov.au/media/publications/defence-technologies-sector-strategy>

Five key focus areas, each with multiple goals that the Victorian government is setting to improve Victoria's defence industry.

STEM in the Education State plan

<https://www.education.vic.gov.au/about/programs/learningdev/vicstem/Pages/about.aspx>

Embeds STEM knowledge and skills development within the curriculum, including an emphasis on critical thinking, collaboration, and ethical decision-making.

TASMANIA

Defence Industry Strategy 2023

<https://www.stategrowth.tas.gov.au/business/sectors/defence/tasmanian-defence-strategy>

Sets the framework for increasing the share of the high value defence market held by local companies.

STEM Framework and STEM Principles

stem.education.tas.gov.au/framework

Aims to increase student engagement, optimise community and parental partnerships, and create opportunities for integrated approaches to STEM teaching and learning.



Glossary of Terms

Capability Improvement Grants: These grants are managed by the Centre of Defence Industry Capability (CDIC). Grants are from \$5,000 to \$250,000 for eligible organisations with direct link to Defence Industrial Priorities (as outlined in the Defence Innovation Hub priorities www.business.gov.au/Centre-for-Defence-Industry-Capability/Defence-Innovation/Defence-Innovation-Hub/Defence-Innovation-Hub-priorities).

CDIC (Centre of Defence Industry Capability): CDIC was established in 2016 and is an initiative from the Defence Industry Policy Statement. The CDIC supports Australian businesses entering or working in the defence industry. Further information is at: www.business.gov.au/centre-for-defence-industry-capability.

DIIP (Defence Industry Internship Program): DIIP provides high performing Year 3 and 4 engineering students with direct connections to defence industry by facilitating 12 week internships with industry small and medium enterprises (SMEs) as part of the Industry Skilling Program Enhancement initiative.

Defence Industry Policy Statement: Was released alongside the 2016 Defence White Paper as a refreshed approach to Australia's defence industry. The report recognised defence industry as a Fundamental Input to (Defence) Capability.

Further information can be found at: www.defence.gov.au/WhitePaper/Docs/2016-Defence-Industry-Policy-Statement.pdf

NDISO (National Defence Industry Skills Office): NDISO will be a directorate within the Department of Defence which will work to deliver the outcomes of the Defence Industry Skilling and STEM Strategy, including implementation work, program management, and advice to Government on defence industry skilling subject matter.

Defence Industry Security Program (DISP): is a risk mitigation and assurance program which enhances Defence's ability to monitor and mitigate the security risks associated with the contracting for, or outsourcing of, services, functions and capabilities.

Defence Industry Skilling Survey: Department of Defence surveyed Defence Industry businesses in 2018 to inform the Defence Industry Skilling and STEM Strategy. Participating organisations were asked questions including, but not limited to, identifying which employment disciplines are believed to be in shortage and the extent of skill shortages.

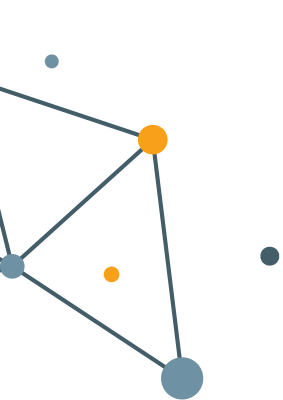
Defence Primes: Large defence industry companies, many of which are global corporations, which are frequently the prime contractors on Defence projects.

Defence White Paper (2016): Was released 25 February 2016 and sets out a comprehensive, responsible long term plan for Australia's defence (www.defence.gov.au/WhitePaper/).

Enterprise Skills: collective term that refers to skills useful and relevant to the workplace such as professional communication, digital literacy and time management.

IIP (Integrated Investment Program): Established through developing the 2016 Defence White Paper and guides the implementation of investment in building the future force and Defence capability goals of the Defence White Paper. Further information is at: <http://www.defence.gov.au/WhitePaper/Docs/2016-Defence-Integrated-Investment-Program.pdf>.

Office of the Chief Scientist: Supports Australia's Chief Scientist and provides secretariat support to the Commonwealth Science Council, of which the Chief Scientist is the Executive Officer. The Chief Scientist's role is to provide high-level independent advice to the Prime Ministers and other ministers on matters relating to science, technology and innovation. Further information is at: www.chiefscientist.gov.au/.



SPP (Schools Pathways Program): SPP is funded by the Department of Defence. Approved organisations deliver diverse projects across Australia to encourage student engagement in STEM and introduces them to the varied opportunities and career pathways in defence industry.

SME (Small and Medium Enterprise): Reference to small and medium size businesses (typically with 1 to 199 employees).

STEM (Science, Technology, Engineering and Mathematics): Collective reference to science, technology, engineering and mathematics in regards to school/tertiary subjects and skills.

Workforce Behind the Defence Force: The Australian Government's Defence Industry Skills and Jobs Information Campaign slogan during 2018.

VET (Vocational Education and Training): A category of workplace-specific skills training, which can be undertaken during high school or at tertiary institutions, such as TAFE. Vocational Education and Training qualifications includes Certificate I, II, III, IV, Diploma or Advanced Diploma.

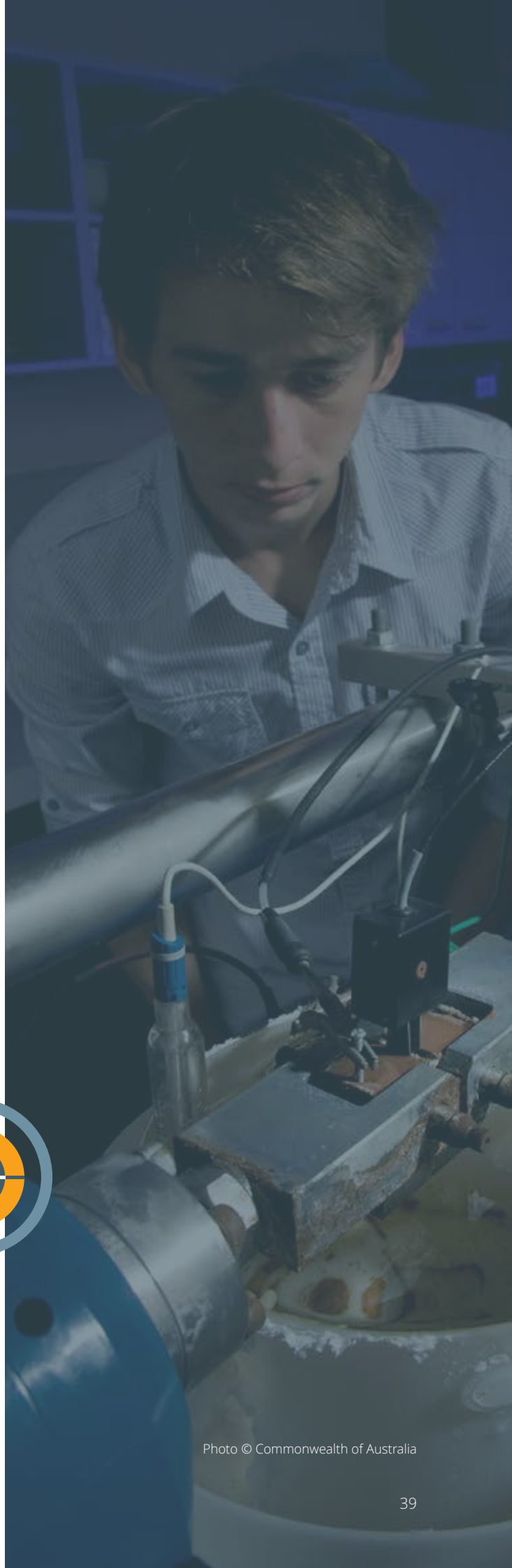


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