

Australia releases Defence Science and Technology plan for implementing its Air Force Strategy to transform to fifth-generation Air Force

Australian Airforce is making investments into range of state-of-the-art surveillance, command-and-control and combat platforms. This includes introduction of advanced capabilities such as the F-35A Lightning II, EA-18G Growler, P-8A Poseidon, the MQ-4C Triton, and space systems including a space situational radar and space telescope. Moreover, Navy and Army are currently introducing transformational aerospace capabilities that include new helicopters, unmanned aerial systems, Landing Helicopter Dock ships and Air Warfare Destroyers, with all three services aiming to integrate these new systems and embrace carefully selected emerging technologies.

Despite the advantages offered by individual capabilities, the full benefit of these platforms will only be realised when they are integrated with the joint force and other enabling capabilities through disciplined design

On 27 February, Chief of Air Force Air Marshal Leo Davies officially launched 'Air Force Strategy 2017-2027', a vision for the Royal Australian Air Force to transition and become a fifth-generation Air Force.

Plan Jericho, the Air Force's program to deliver a 5th generation fighting force, emphasises the need for Air Force to transform and not simply evolve. Plan Jericho has highlighted the importance of developing a future force which

is agile and adaptive, truly integrated and immersed in the information age. By 2025 the Air Force aims to be a truly information age force, working jointly with Navy and Army and in close partnership with other Government agencies, as well as alliance and coalition partners.

Now Australian government has released its Aerospace S&T strategy "Shaping Defence Science and Technology in the Aerospace Domain 2017-2027". The aim of this strategy is to guide ongoing research in the aerospace domain that focuses the efforts of scientists and engineers working across the S&T enterprise. The strategy represents a partnership between Air Force and Defence Science and Technology Group (DST Group) to identify and take forward S&T that secures the best military aerospace capabilities for Australia; able to deliver air power and space effects within volatile, uncertain, complex, ambiguous and contested environments.

Air Force Strategy 2017-2027

The five strategic vectors identified in the 'Air Force Strategy 2017-2027' are Joint Warfighting Capability; People Capability; Communication and Information Systems; Infrastructure; and International Engagement. Of these, Chief of Air Force highlighted Joint Warfighting and People Capability as those areas that would require the most fundamental changes.

Joint Warfighting Capability

The Strategy outlines Air Force's intent to maximise integration of its current systems, and achieve full integration of future systems, with other Defence systems and procedures. Rather than individually procure equipment and then reverse engineer solutions to make it work together, the Australia Defence Force will be 'joint-by-design' through an

improved capability acquisition process. Jointness in non-traditional domains such as space and cyber will also be increasingly important as modern defence forces' recognise the enormous impact they have on operations in the more traditional domains of air, sea and land.

People Capability

Technology alone cannot be relied on to maintain a decisive advantage in warfare – it is often obsolete soon after being introduced, has become more accessible to our adversaries and is likely to be targeted early on in a major conflict.

Instead Air Force members' cognitive skills can provide a greater capability edge, where they are able to out-think and out-play the adversary. Thus the Strategy aims to create a 'fifth-generation workforce' that is 'comfortable with uncertainty'. This will require major shifts in how Air Force delivers its program of professional military education and training.

Communication and Information Systems

The objective of the Communication and Information Systems (CIS) vector is to increase the compatibility of Air Force's disparate systems, as well as ensure they are robust and redundant on operations. As with the 'joint-by-design' concept, the goal is that CIS should be networked with existing systems when acquired, and not through later workarounds and 'stitching' of systems. The Strategy also emphasises the requirement to operate in contested and degraded electronic environments, and the need to increase its members' technical proficiency in electronics systems.

Infrastructure

Air Force operates from its bases, but over the years relatively little thought has been given to whether its infrastructure is optimised to support modern operations. The Infrastructure vector seeks to reconsider the role of bases as a capability enabler, and ensure they are hardened and adaptable enough to survive future conflict. The Strategy aims to develop new operating concepts for its bases, to include mobile and agile basing.

International Engagement

The 2016 Defence White Paper described Defence international engagement as part of a broader Government approach to building international partnerships alongside trade, diplomacy, foreign aid and economic capacity building. Key outcomes of greater Defence international engagement are enhanced interoperability, greater access to information, and provision of opportunities for mutual development. Effective international engagement can also reduce the potential for armed conflict by increasing 'transparency and trust' with a range of regional and global partners. The International Engagement vector is based on the person-to-person relationships developed by Air Force personnel, facilitated by improved cultural awareness and language training.

Science and technology Strategy

To facilitate management of priorities and allocation of resources across S&T activities, research efforts need to be aligned with Defence requirements. To achieve this, six aerospace domain focus areas have been developed. These focus areas are designed to span a range of time horizons and are independent of specific phases of the Capability Life Cycle.

The six aerospace domain S&T focus areas are:

1. Decision Superiority

The vision is to dominate the adversary's decision cycle through employment of aerospace capabilities that successfully acquire, assimilate, exploit and share data and information across the joint force within contested and congested environments. To achieve decision superiority will require integrated platforms, intelligence, surveillance and reconnaissance (ISR), full spectrum electronic warfare capabilities, and space assets to be harmonised as part of a joint capability.

2. Ensured Operational Availability – To maximise the availability of operationally effective capabilities for missions.

The vision is to maximise the availability of operationally effective capabilities within robust and resilient frameworks that deliver cost effective, assured and acceptable levels of safety. Science and technology supports all facets of operational availability. This includes support to the aviation safety program as an essential foundation for the generation of mission-capable platforms and systems.

3. Force Experimentation and Preparation

The aim is to design a potent and flexible military aerospace capability for Australia; and ensure professional mastery of strategy, concepts and tactics for advanced and novel aerospace capabilities To design the future force and ensure

professional mastery of strategy, concepts and tactics. Force experimentation and preparation encompasses a breadth of activities, including assessment of strategic options, concepts exploration, tactical innovation, mission rehearsal, and skills training

4. Force Projection

The aim is to provide military options to the Australian Government through aerospace capabilities that deliver force projection within joint and coalition contexts. Science and technology will be applied to support Defence to operate freely across the global commons, including in contested and denied environments. To operate freely will involve, where directed, the delivery of kinetic and non-kinetic effects at long range. It will be supported and enabled by research in targeting, damage assessment and effects control/precision. This includes supporting the provision of airlift and forward basing.

5. Joint and Combined Operations

The aim is to flexibly integrate aerospace capabilities across multiple domains (sea, land, air, space and cyber) and with operational partners to provide synchronised awareness and effects with minimal additional resource investment. Future joint and combined operations will include the integration of ISR, precision strike, manoeuvre, and sustainment to achieve desired effects across all operating domains based on the ubiquitous sharing of information

6. Survivability

The aim is to maintain aerospace capabilities able to support, generate and sustain enduring operations within challenging, complex and contested environments. Science and technology supports all elements of survivability, including in the areas of signatures, countermeasures, and infrastructure. This includes supporting the survivability of critical enablers including space and terrestrial networks, and ensuring their availability at air bases (fixed and/or deployed) with sufficient robustness to withstand external attack. Aerospace platforms and weapons operated by the Australian Defence Forces must be able to successfully operate within, and return from, a hostile operating environment and when damaged must be capable of quick damage assessment and adequate repair for continued operations. Science and technology has a central role in assessing vulnerabilities and improving survivability.

The Air Force and DST Group partnership supports ongoing long term research, while also enabling timely delivery of identified research at accelerated speeds to achieve enduring and transient capability outcomes.

To achieve research to capability outcomes, the application of S&T will be considered across the three temporal force states of the Capability Life Cycle (Force in Being, Planned Force, Future Force) in the context of the three temporal innovation horizons. The strategy will also provide for the enduring air power and space components that depend on the reliable application of established research programs; for example, the Jindalee Operational (over-the-horizon) Radar Network (JORN) and Airborne Early Warning and Control capabilities.

References and Resources also include:

<http://centralblue.williamsfoundation.org.au/launch-of-the-air-force-strategy-2017-2027-alexandra-mccubbin/>

<https://www.dst.defence.gov.au/sites/default/files/divisions/documents/Aerospace%20S%26T%20Strategy%202017-2027.pdf>