In the near future, the Royal Australian Air Force (RAAF) aims to become a 5th-generation force. A 5th-generation air force provides the necessary capability to win against the increasingly complex and lethal threats to national security in the Information Age.

The Defence White Paper 2016 posits that over the next 20 years a larger number of regional forces will be able to operate at greater range and with more precision than ever before. The RAAF’s new fleet of fifth-generation airborne systems will be able to maintain, for now, capability superiority in the region. Regardless of their capability, all airborne systems must recover to an airbase to regenerate. On the ground, all airborne systems are equally vulnerable to attack. Superior 5th-generation systems and capabilities offer no inherent protection against threats when on the ground. Further, the data-hungry platforms may be more dependent on airbase systems and services than their predecessors. A fifth-generation system, based at a second-generation airbase is no less vulnerable, and is probably more so, than a second-generation aircraft in the same environment.

While the RAAF maintains capability superiority in the air, opponents are likely to seek an asymmetric advantage. Unable to match the RAAF’s airborne combat capability, a potential adversary will almost certainly examine whether RAAF airbases present a soft underbelly for targeting with long range missile systems, special operations forces, and/or through other unconventional means.

As regional forces modernise, and technical superiority is less of a factor, the success of the Air Force in a contest will become more reliant on the effectiveness of the regenerative capability of supporting airbases; how quickly aircraft can be recovered, repaired, refuelled, reconfigured, rearmed and data transferred.

Air Force’s contribution to future joint warfighting needs to be underpinned by airbases able to defeat threats to themselves and the hosted combat forces, and able to effectively coordinate and provide services critical to the combat effectiveness of the hosted forces.

Ground-based threats to modern airbases are evolving due to, among other things, globalisation, urban encroachment and new military and consumer technologies. Urban encroachment around airbases and expeditionary airfields allows hostile parties to conduct surveillance with minimal risk of detection and to launch surprise attacks. Uninhabited Aerial Vehicles (UAVs) can be used for real-time surveillance and to provide targeting information for easily available conventional weapons such as mortars and rocket-propelled grenades. Weaponised UAVs are now being used in combat to deliver improvised munitions. Precision guided mortar munitions are now being fielded; providing a low-footprint, highly effective system for precision targeting of airbases. Physical security measures implemented to counter intelligence gathering provide no protection for aircraft from stand-off kinetic attack. There is also an increasing threat of cyber attack, denying 5th-generation
aircraft access to airbase communications systems essential for missions planning, sustainment and data transmission.

Globally, successive generations of combat aircraft flown by both air force and naval aviators have incorporated progressively more sophisticated avionics to support the aircrew’s ability to collate, process and fuse an increasing amount of data to support situational awareness, decision making and response. Since the era of the second-generation jet fighter in the early 1960s, (Pathfinder No 170 explains the different generations of jet fighters) the platforms from which naval aviators operate—the aircraft carriers—have similarly evolved, incorporating increasingly sophisticated Combat Management Systems (CMS) to support their own decision-making and warfighting capability.

Wargaming by the US military as early as the 1950s revealed that naval combat systems relying on ‘manual track plotting’ and ‘human-in-the-loop information processing’, could not effectively counter contemporary Soviet threats. As a result, the first automated combat information processing system, the Naval Tactical Data System was developed and fielded in 1964. Since then the US has evolved successive generations of systems including Aegis and the Ship Self Defence System Mk1 and Mk2. Royal Australian Navy vessels field similar systems, primarily the Saab 9LV Combat Management System.

In contrast to the evolution of naval support systems, RAAF support platforms—airbases—have not developed automated information processing systems to support their force protection and force generation and sustainment roles.

RAAF airbase commanders are responsible for the provision and coordination of over 200 products, services and effects necessary to protect and enable the generation of air power capability in accordance with a designated air component commander’s requirements and priorities. Presently, every aspect of RAAF airbase support requires human-in-the-loop analysis and information processing at each stage of the process, usually within functional ‘stove-pipes’. This places at risk the ability of the airbase commander to effectively counter contemporary and emerging threats while concurrently maintaining effective coordinated support to the combat force.

Sixty years of development of naval combat information systems provides Air Force with a roadmap for the development of 5th-generation airbases as essential elements of the fully 5th-generation Air Force. To function effectively in support of 5th-generation aerospace systems, in the face of evolving and proliferating threats, airbases require a modern digital combat information system; able to collate, fuse and distribute information to provide situational awareness and decision support across the airbase and broader Theatre Air Control System. Once the digital core is in place, all other enabling and supporting airbase systems can be fully digitised and modernised to improve awareness, agility, efficiency and reporting. The outcome will be a far more responsive and effective system of airbases with less reliance on, and demand for, personnel as information sensors and processors.

5th-generation airbases, developed as weapon systems modelled on modern naval combat systems, would require a less numerous but more specialised workforce to operate them. Navy employs general and specialist Combat System Operators for the collection, collation, and dissemination of sensor information, and Maritime Warfare Officers for control and warfighting functions. Air Force, in comparison, does not presently maintain a specialist airbase warfare or airbase systems workforce. The 5th-generation airbase workforce would need to be more highly trained and more invested in airbase functions. Airbase operations may need to be treated, for key functions, as a specialist stream as in other Air Force groups.

Key Points

• Airbases have not evolved in parallel with other Air Force weapon systems.

• The core of the 5th-generation airbase should be a modern combat information system.

• Evolved 5th-generation airbases will require an evolved specialist workforce to operate them.