Australian Government

SDIP 6 - Integration and enhancement of battlespace awareness and management systems

Annex B6

Defence acknowledges the Traditional Custodians of Country throughout Australia. Defence recognises their continuing connection to traditional lands and waters and would like to pay respect to their Elders both past and present.

Defence would also like to pay respect to the Aboriginal and Torres Strait Islander peoples who have contributed to the defence of Australia in times of peace and war.

Overview of Annex B

This Annex contains the Detailed Sovereign Defence Industrial Priorities (Detailed SDIPs) for SDIP 6, in accordance with Chapter 3.

The SDIPs are:

> **SDIP 1.** Maintenance, repair, overhaul and upgrade (MRO&U) of Australian Defence Force aircraft
>
> **SDIP 2.** Continuous naval shipbuilding and sustainment
>
> **SDIP 3.** Sustainment and enhancement of the combined-arms land system
>
> **SDIP 4.** Domestic manufacture of guided weapons, explosive ordnance and munitions
>
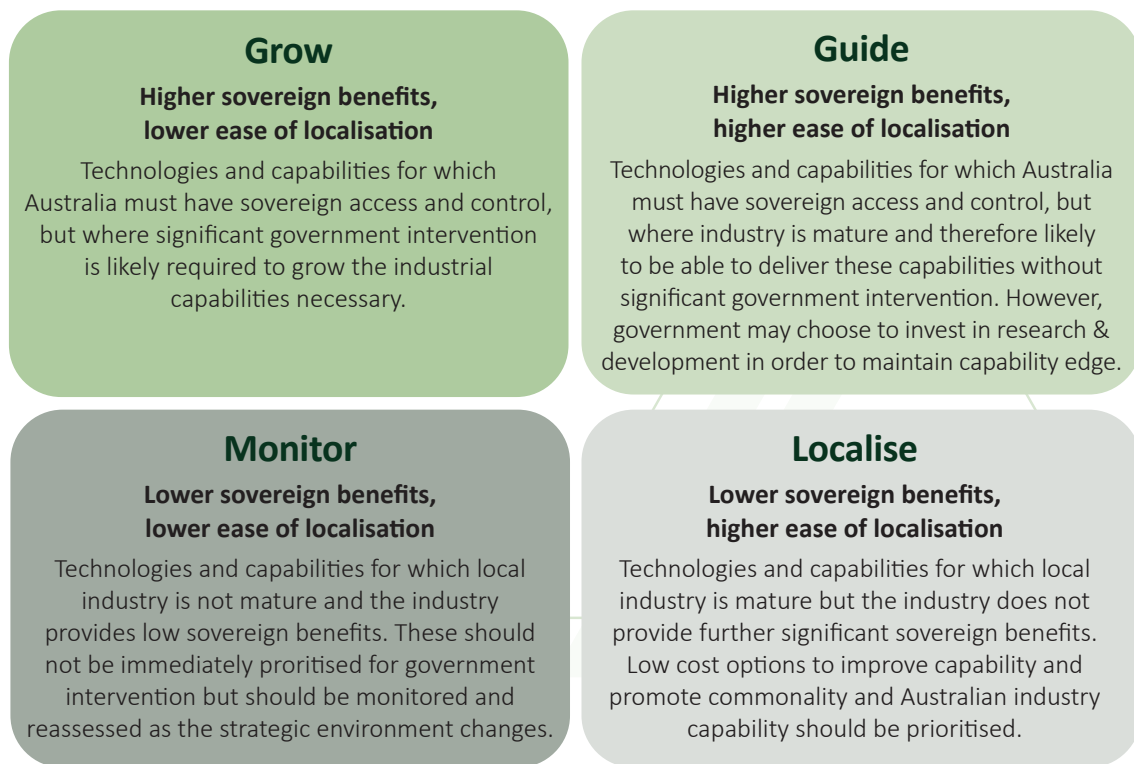> **SDIP 5.** Development and integration of autonomous systems
>
> **SDIP 6.** Integration and enhancement of battlespace awareness and management systems
>
> **SDIP 7.** Test and evaluation, certification and systems assurance

There are many areas where defence industry is already providing a service or capability to Defence; for example, the provision of enabling information and communication technology support including data centres, cyber and health services. Defence will continue to work with industry to ensure we have the level of industrial capability required in Australia to deliver defence outcomes.

Defence will refine the information in these Annexes through consultation with industry, and in line with the biennially-updated National Defence Strategy. Defence will work with industry to identify shortfalls, critical paths and areas for growth, using the approach described in Chapter 3 (Figure 4). The aim is to consistently and continuously guide and grow the defence industrial base, aligned to Defence's needs.

Figure 1 - Approach to industrial prioritisation

Grow
Higher sovereign benefits, lower ease of localisation

Technologies and capabilities for which Australia must have sovereign access and control, but where significant government intervention is likely required to grow the industrial capabilities necessary.

Guide
Higher sovereign benefits, higher ease of localisation

Technologies and capabilities for which Australia must have sovereign access and control, but where industry is mature and therefore likely to be able to deliver these capabilities without significant government intervention. However, government may choose to invest in research & development in order to maintain capability edge.

Monitor
Lower sovereign benefits, lower ease of localisation

Technologies and capabilities for which local industry is not mature and the industry provides low sovereign benefits. These should not be immediately prioritised for government intervention but should be monitored and reassessed as the strategic environment changes.

Localise
Lower sovereign benefits, higher ease of localisation

Technologies and capabilities for which local industry is mature but the industry does not provide further significant sovereign benefits. Low cost options to improve capability and promote commonality and Australian industry capability should be prioritised.

Capability and Delivery Managers

The Vice Chief of the Defence Force is responsible for defining and communicating the capabilities Defence requires of Capability Managers. Capability Managers and Delivery Managers are responsible for the growth and health of the industrial capabilities required to deliver and sustain the directeddefence capabilities.

Industrial capability lifecycle

The information provided for each Detailed SDIP contains Defence's requirements against the industrial capability lifecycle.

The industrial capability lifecycle consists of:

Innovation, Science & Technology	Design & Development	Integration & Adaptation	Manufacture & Assembly	Sustainment & Support

- **Innovation, Science & Technology –** innovative technology solutions that have been identified as meeting a defence capability need and providing an asymmetric advantage for Defence to develop, explore and mature to pull through to capability. These would be candidates for consideration under the Advanced Strategic Capabilities Accelerator (ASCA).
- **Design & Development –** areas that require further maturation and development beyond the prototype phase to meet a defence capability need.
- **Integration & Adaptation –** mature industry solutions or systems that need to be integrated with other defence systems and/or adapted to meet a defence capability need.
- **Manufacture & Assembly –** industry solutions, systems or components that Defence has determined must be manufactured and/or assembled in Australia, to ensure sovereignty and/or supply chain security and resilience.
- **Sustainment & Support –** industrial capabilities and services that Defence has determined must be delivered by industry in Australia to sustain and support defence capability.

SDIP 6 - Integration and enhancement of battlespace awareness and management systems

Capability and Delivery Manager

The Officer accountable for providing direction to Capability Managers for the integration and enhancement of battlespace awareness and management systems SDIP is the Vice Chief of the Defence Force. The Delivery Manager is the Deputy Secretary Capability Acquisition and Sustainment.

Background

The Defence Strategic Review highlighted the criticality of an enhanced, integrated targeting capability, a networked expeditionary air operations capability, an enhanced all-domain, integrated air and missile defence capability, and a theatre command and control framework that enables an enhanced Integrated Force.[1]

Battlespace awareness is required at the strategic, operational and tactical levels of command and control across air, maritime, land, space and cyber domains, and the electromagnetic spectrum, from seabed to space. Defence must invest in the targeting systems and processes required for advanced and long-range weapons, undersea warfare, and integrated air and missile defence.

The size of the Australian theatre means advanced sensors, capable of long-range monitoring and detection, and long-haul communications (such as very low frequency, high frequency or satellite communications), are especially valuable across all domains. These also support a focused-force approach seeking to provide long-range strike, undersea warfare and integrated air and missile defence.

Providing an effective, resilient and secure flow of information across Defence enables both efficient operation of current capabilities, and an important backbone for the rapid integration of new capabilities and innovations. Defence and industry need to be ready for new challenges by developing and maintaining:

▶ A digitally capable, security-cleared and specialised workforce skilled in software development, engineering, information technology, cyberworthiness and data science.

▶ Advanced active and passive sensors, electronics and systems engineering, including improved data and sensor fusion and assured position, navigation and timing.

▶ Secure and cyberworthy infrastructure that supports working in an appropriately classified environment.

▶ Supply chains for key capabilities that are frequently fine-tuned to reduce the risk of security compromise of hardware or intellectual property, and are resilient to international supply chain disruptions.

Prioritisation approach

Our priority is the ongoing delivery of integrated systems providing sufficient operational awareness and control to operational commanders, securing existing systems until they are replaced.

In the immediate term, Defence will prioritise the industrial capability needed to continue the integration of existing systems to deliver effects across long-range strike, undersea warfare and integrated air and missile defence capabilities from seabed to space. This will be expanded to optimise our sensors and networks for the evolving strategic circumstances; however, sharing further detail may be limited to security-classified environments due to the sensitive nature of the technologies involved.

---

1   DSR pages 54 and 55

Epoch 1 outcomes

Defence will drive the continuous improvement of various battlespace awareness and management systems, particularly in relation to integration of different battle management systems, sensors, effectors and communications systems. This will achieve operational resilience and relevance in a changing threat environment. As an example, a sovereign, modular open architecture Joint Air Battle Management System (JABMS) capability will enable the integration of current and future Australian Defence Force (ADF) and coalition capabilities.

Defence will leverage interfaces to active and passive sensors, including organic sensors and other data sources (including commercial data sources), to achieve battlespace awareness.

Defence will also deliver enhanced machine-to-machine connectivity with current joint force battlespace entities using resilient, cyberworthy and mode-diverse communications.

To deliver these capability outcomes Defence will need to consider:

▸ Increased battlespace appreciation of the maritime domain, in particular the undersea battlespace, leveraging the power of both acoustic and geospatial data.
▸ Long-term, agile, responsive, sustainable, affordable, secure and cyberworthy battle management and long-range targeting capabilities that can continue to evolve to meet emerging threats.
▸ Development of enabling technologies and resilient architecture, such as high precision timing systems, advanced signal processing, data integration systems, machine learning and artificial intelligence, environmental sensing and modelling to enhance system resilience and performance in a congested and contested environment.
▸ Development of enabling digital engineering environments, including the use of digital twins, tools and enabling systems.
▸ Development of multi-level security systems and frameworks to enable appropriate data sharing across Defence.

Epoch 2 outcomes

Defence will drive continuous improvement of the various battlespace awareness and management systems at different stages in their lifecycles, including:

▸ Adapting to maintain relevance in a changing threat environment.
▸ Improving integration of different battle management systems, sensors, effectors and communications systems and increasing automation.
▸ Improving the fidelity and integration of digital twins and tools.
▸ Improving resilience to ensure capability continuity in a degraded environment and harden against security compromise.
▸ Improving asset management and sustainment through the development of digital twins, intelligent asset management, remote condition monitoring and big data exploitation.

During Epoch 2, the proportion of system improvements generated by software-based enhancements is likely to increase.

Detailed Sovereign Defence Industrial Priorities

Battlespace awareness and management comprise multiple systems, and systems-of-systems, rather than a single homogenous ADF system. The Detailed SDIPs are based on a taxonomy for the generic needs of battlespace awareness and management systems at different stages in their capability lifecycles, rather than being specific to a single system or project.

The Detailed SDIPs are:

- **Battlespace management software –** used to orchestrate military forces. Battle management applications comprise software hosted on computing hardware connected to one or more networks. The future vision (for example, under the JABMS) is the use of open architectures that will integrate disparate systems to deliver sovereign and joint capability effects.

- **Sensors –** which are dedicated to a particular battlespace awareness system, or networked from a platform or other capabilities such as strategic intelligence. Examples include:
    - Electro-optic/infra-red/ultra violet/hyperspectral sensors.
    - High frequency sensors for long-range persistent air and maritime surveillance.
    - Electronic warfare and cyber sensing capabilities.
    - Integrated acoustic active and passive sensors, fixed and mobile, for undersea surveillance.
    - Integrated sensor networks for persistent surveillance of space objects and phenomena, that can be certified and operated as part of a global network shared with our trusted partners.
    - Integrated orbital sensor networks for Earth observation, that can be certified and operated as part of a global network shared with our trusted partners.
    - Advanced radar technologies (both active and passive) that offer scalable and capable radars for use in the maritime, land, air and space environments, including ongoing investment in CEA Technologies.

- **Secure communication –** enabled by software and hardware that delivers distributed, resilient and secure communication across the integrated force that supports increased battlespace awareness aimed at achieving optimised targeting level accuracy and latency.

- **Military platform signature management –** including software and hardware solutions to measure, characterise and reduce the electronic, electro-optical, infra-red, acoustic and digital signatures of military platforms.

- **Integration –** including:
    - Integration of tactical sensor and persistent surveillance technologies at multiple security levels into the ADF and Five-Eyes Command, Control, Communications, Computing and Intelligence systems.
    - Integration of tactical sensor hardware and software with host platforms, other sensors and control systems (including combat management systems), and certification of integrated sensor networks for operational use.
    - Advanced integration between battle management decision coordinators and effector systems, both kinetic and non-kinetic, across multiple domains including support to the certification of related integrated fire control networks.
    - Integration across battlespace awareness systems in multiple domains and security levels via a standardised architecture for interoperability.

- **Software-based enhancements –** to improve the performance of individual or networked sensors, and our ability to use intelligence to make informed timely decisions. Examples include:
    - Advanced signal processing algorithms and software for radar, electronic warfare, imaging and sonar sensors.
    - Sensor fusion and real-time data processing, exploitation, dissemination and presentation algorithms and software.
    - Big data processing, exploitation, dissemination and presentation algorithms and software.
    - Automated decision aids, designed to assist human decision-making and improve its quality and timeliness, leveraging data analytics and artificial intelligence/machine learning while still ensuring appropriate levels of human control.
    - Cloud and edge computing to maximise access to timely, secure and reliable data processing resources in the battlefield at the operational and tactical levels while enabling interoperability with coalition partners.
    - Integrated digital engineering solutions such as model-based systems engineering, test automation, and relevant openness frameworks. The aim is to provide integrated and collaborative environments conducive to rapid, seamless and cost efficient deployment of system advancements.

Table 1 - Detailed SDIPs for SDIP 6, Epoch 1 (2023-25)

Description	Innovation, Science & Technology	Design & Development	Integration & Adaptation	Manufacture & Assembly	Sustainment & Support
Battlespace management software		✔	✔	✔	✔
Sensors	✔	✔	✔	✔	✔
Secure communication		✔	✔		✔
Integration		✔	✔	✔	✔
Software-based enhancements	✔	✔	✔	✔	✔

Table 2 - Detailed SDIPs for SDIP 6, Epoch 2 (2026-30)

Description	Innovation, Science & Technology	Design & Development	Integration & Adaptation	Manufacture & Assembly	Sustainment & Support
Battlespace management software		✔	✔	✔	✔
Sensors	✔	✔	✔	✔	✔
Secure communication			✔	✔	✔
Integration		✔	✔	✔	✔
Software-based enhancements	✔	✔	✔	✔	✔

✔ - Continuation from Epoch 1
✔ - New in Epoch 2