Epirus' Submission

Joint Standing Committee on Foreign Affairs, Defence and Trade inquiry into the Department of Defence Annual Report 2023-24

Contents

Executive Summary

Epirus welcomes the opportunity to provide a submission to the Joint Standing Committee on Foreign Affairs, Defence and Trade to inform its inquiry into the Department of Defence Annual Report 2023-24.

Our submission responds to, and makes recommendations relating to, focus areas three and four listed in the inquiry's Terms of Reference – '*AUKUS,'* and '*Uncrewed/Autonomous Systems, AI and their integration into the Joint Force'*. While the focus of theme four is naturally upon the Australian Defence Force's (ADF's) capability, in this document it is considered in the context of the growing need to defend against the increasing threat posed by drone swarms deployed by potential adversaries, including non-state actors.

As a leader in advanced high-energy microwave systems and counter-uncrewed aerial systems (CUAS), Epirus offers unique insights into how Defence can enhance its capability to counter drone swarm threats effectively. Defeating drone swarms at scale is a critical capability to protect Defence assets, infrastructure, and personnel in complex operational environments.

This submission highlights the importance of Defence engaging with industry partners who are at the forefront of technological advancements to ensure the ADF is equipped with and has access to best-in-class capabilities. Rapid technological advancements require agile acquisition processes, along with enhanced safeguards to protect technology and mitigate the risk of intellectual property theft, enabling the ADF to stay ahead of emerging threats and maintain operational superiority.

Additionally, the AUKUS trilateral security agreement presents new opportunities for deeper collaboration with the United States (US) and United Kingdom (UK), fostering enhanced technology acquisition and integration. In today's rapidly evolving threat landscape, it is critically important that the ADF acquire best in class and leading-edge capability.

If you have any questions about the content of our submission, please contact Edward Graziano

Recommendations

Epirus recommends that:

Recommendation 1: Multi-layered protection

The Committee acknowledges the benefits and importance of enhanced **multi-layered protection**, including capabilities that can defeat swarms of drones, such as **high-energy microwaves**, and recommend that the Department of Defence continue pursuing capabilities that include multiple types of sensors and effectors to safeguard Australian military infrastructure, expeditionary bases, dismounted personnel, and all classes of vehicles.

Recommendation 2: Agile governance

The Committee recommends that the Department of Defence continue to implement a governance model that prioritises **speed to capability**, flexibility, sustainment, and the ability to adjust based on emerging technologies and trends.

Recommendation 3: Focus on emerging threats.

The Committee recommends that the Department of Defence recognise the growing risk posed by low cost and highly proliferated kamikaze drones and drone swarms paired with artificial intelligence, and ensure the LAND 156 program mandates capabilities to defeat **drone swarms**, addressing evolving threats to ADF personnel and assets.

Recommendation 4: Leverage AUKUS legislation

The Committee recommends that the Department of Defence continue to **leverage the AUKUS partnership** and promote industry's use of changes to defence trade controls that enabled enhanced defence industry cooperation under AUKUS. This will unleash the rapid delivery of sensors and effectors necessary for achieving layered counter-drone effects on modern battlefields.

Submission

Uncrewed/Autonomous Systems, AI and their integration into the Joint Force: enhanced multi-layered protection, speed to capability and focus on emerging threats.

AUKUS: leverage AUKUS legislation and engage with US- and UK- based companies to ensure access to the latest technology.

As the Australian Defence Force (ADF) looks to the future, integrating uncrewed and autonomous systems, artificial intelligence (AI), and advanced technologies into the joint force is not merely a technological upgrade, but a strategic imperative. These advancements hold the potential to redefine how military forces operate, respond to threats, and maintain operational superiority in an increasingly complex security environment.

Of particular concern are the growing threats posed by uncrewed aerial systems (UAS) and drone swarms, which present new challenges for the force protection of militaries worldwide. These have recently been most evident in the Ukrainian conflict, where the rapid acquisition and deployment of UAS have changed the threat landscape on the battlefield and extended to critical infrastructure. To address these threats effectively, a multi-faceted approach that focuses on enhanced multi-layered protection, the speed of technology acquisition, and a forward-looking focus on emerging threats, is essential.

Enhanced multi-layered protection

The proliferation of UAS, particularly drone swarms, has introduced new complexities in military operations. These threats are highly versatile and can be deployed in large numbers, posing a significant challenge to traditional defence strategies. In response, Defence is appropriately preparing to adopt a multi-layered defence strategy that integrates a combination of sensors and effectors to counter and neutralise UAS threats.

A critical aspect of multi-layered protection is the integration of sensors and effectors across all traditional domains (air, land, maritime and space). This can be achieved

through a combination of radar systems, electro-optical sensors, and other sensors that work together to provide a real-time, comprehensive picture of the battlefield.

Once a threat is identified, neutralisation must be approached through a combination of effectors, including electronic warfare measures, cyber capabilities and kinetic options. Defence must invest in technologies that provide flexible responses, allowing for a graduated use of force depending on the threat level, especially in domestic defence scenarios or when the potential for collateral damage from kinetic systems must be considered. The incorporation of directed energy systems and other advanced effectors into existing defence infrastructure will enhance operational flexibility and ensure preparedness for a range of threats, from isolated drone incursions to complex, coordinated swarm attacks.

Speed to capability and technology acquisition

The rapidly evolving landscape of UAS technology means that Defence should continue to seek to move quickly to acquire and integrate new capabilities. Speed of capability acquisition has become a critical challenge, as emerging threats develop at a pace that traditional procurement processes may not be able to keep up with. In this context, Defence should be applauded for seeking to implement a governance model for the LAND 156 CUAS program[1] that enables a system integration partner to support the streamlining of technology acquisition processes and embrace agile procurement models that enable quicker deployment of new technologies into the joint force as the threats and technologies evolve over time.

The speed of technological changes and the rapid deployment of threats necessitates that Defence puts itself in a position where it maximises access to markets, maximising speed to capability and technology acquisition. By reducing decision-making timelines and improving situational awareness, Defence can respond more decisively and effectively to threats as they emerge.

---

*"Defence is working to simplify and streamline its capability acquisition systems. It is focusing on **speed to capability** and value for money, coupled with appropriate strategy and policy settings across government to reduce the complexity for industry when working with Defence," -* Deputy Secretary Defence Strategic Review Implementation Tom Hamilton[2]

Focus on emerging threats: Drone swarms and beyond

As the global security environment becomes more complex, Defence must remain vigilant in identifying and responding to emerging threats. Among these, drone swarms represent a particularly challenging scenario. A swarm of small, autonomous drones has the potential to overwhelm traditional defence systems with sheer numbers and coordination.

These swarms can carry out a variety of tasks, from surveillance and intelligence gathering to direct attacks on critical infrastructure or military assets.

The challenge of countering drone swarms lies in their adaptability and the difficulty in distinguishing between a harmless drone and one carrying an explosive payload or other weaponry. Additionally, swarms can be difficult to track due to their decentralised control and low visibility, making it harder to predict their movements and intentions. To address this, Defence must invest in both technology and tactics to mitigate this threat.

Technological innovation will be key in developing effective countermeasures against drone swarms. AI-enabled systems can help detect, track, and predict swarm behaviour, allowing for quicker identification of threats and more precise countermeasures. In addition to radar and optical systems, directed energy systems, such as high-energy microwave systems, play a pivotal role in neutralising drone swarms without expending costly ammunition or risking collateral damage. It is critical that Defence ensures that the LAND 156 program evaluates how any CUAS capability will necessarily need to be agile to respond to threat evolution and be scalable for multiple large-scale deployments. Capability solutions will also need to be able to detect, track and defeat UAS in domestic and deployed, austere environments.

Defence must stay ahead of these trends by continuously investing in expert technology partners, expanding access to best-in-class technology, and maintaining a forward-thinking defence strategy. For this reason, Defence's approach to the LAND 156 program to continually acquire the most advanced technology over time is laudable, as this will ensure its defences are as strong as possible against the evolving drone threat.

"As the nature of drone warfare becomes ever more sophisticated, the tactics employed by drone forces are also evolving. Ukraine's drone units are already beginning to move beyond the initial concept of "one drone, one operator," and will be looking to transition toward more widespread use of drone swarm technologies in 2025." Nataliia Kushnerska[3]

AUKUS

The AUKUS agreement and its accompanying changes to the traditionally burdensome and bureaucratic US International Traffic in Arms Regulations (ITAR), along with Australia's defence export control reform, mark a significant shift in Australia's defence capabilities and the deepening of cooperation between the US and Australian defence industry. These landmark changes provide access to cutting-edge US technologies, markets, and defence industry that advance Australian national security and benefit Australian industry which can now partner with US companies more easily. The AUKUS partnership facilitates the sharing of advanced defence technologies under Pillar Two, including those related to autonomous systems and electronic warfare, which are becoming increasingly critical for maintaining a competitive edge in modern warfare.

Through significant reduction of burdensome ITAR requirements and barriers to defence industry collaboration, AUKUS greatly strengthens and streamlines Australia’s ability to integrate state-of-the-art capabilities into its military, enhancing interoperability with US military assets and ensuring that both nations are better prepared to respond to evolving security challenges anywhere in the world. This deeper engagement not only boosts Australia's defence posture but also solidifies its position as a key partner in regional security and global defence initiatives.

Conclusion

As Defence continues to modernise its capabilities, the integration of advanced CUAS technologies will be essential to addressing evolving threats. A multi-layered approach that leverages the integration of sensors and effectors across domains will be critical to enhancing situational awareness and delivering effective responses to emerging challenges.

Defence's focus on initiatives such as the LAND 156 program, coupled with the opportunities presented by the AUKUS partnership, provides a pathway to accessing and integrating advanced technologies that can enhance operational effectiveness. Ensuring that acquisition processes remain flexible and responsive will be key to maintaining a strategic edge in an increasingly complex threat environment.

About Epirus

Epirus is a US-based technology company specialising in the development of advanced high-energy microwave systems for defence and security applications. The company's directed energy solutions are designed to address emerging threats, such as uncrewed aerial systems, by providing non-kinetic, scalable, and cost-effective alternatives to traditional defence capabilities. Epirus' technology offers precision and adaptability, making it suitable for a range of operational environments.

With a strong focus on research and development, Epirus continues to advance its high-energy microwave capabilities to meet evolving security challenges. Its solutions are designed to integrate with existing defence systems and provide enhanced protection against complex and dynamic threats. The company works closely with government and industry partners to ensure its technologies align with modern operational requirements and strategic priorities.

Epirus' expertise in directed energy technology is particularly relevant in the context of initiatives such as AUKUS, where collaboration and technological innovation are critical to enhancing defence capabilities. The company's focus on delivering flexible and effective solutions positions it as a key contributor to efforts aimed at strengthening defence resilience and maintaining operational superiority in an increasingly complex security environment.

Epirus Contact Details

For further information on this submission and additional information relating to Epirus' capabilities and experience, please contact the below:

Mr Edward Graziano, Senior Director, Epirus

Mr Edward Graziano is the Senior Director for the United States Armed Services and Australia at Epirus, Inc. He leads business development efforts to provide advanced technology solutions to the US Army, Navy, Air Force, Marine Corps, and international clients, while also cultivating relationships across US and Australian operational and acquisition communities.

He collaborates with the business development team, government relations, contract management, and the Chief Growth Officer to execute program strategies, aligning closely with the engineering team on customer requirements and operational demands.

Before joining Epirus, Mr Graziano held senior roles at Northrop Grumman Aerospace Systems, including International Program Director for the MQ-4C Triton autonomous aircraft system and Engineering Director for High Altitude Long Endurance programs.

He holds a bachelor's degree in science and electrical engineering from Manhattan College, a master's degree in science and electrical engineering in RF Engineering from Polytechnic University and completed the Advanced Program Manager Course at Defense Acquisition University.

[1] LAND 156 is Defence's program to acquire a system that can detect and destroy enemy drones on future battlefields. The program will acquire sensor systems to detect drones, a variety of effectors to defeat the drones, and a command-and-control system to coordinate the cueing the multiple effectors.

[2] 2023 Defence Strategic Review - Turning expectations into reality more quickly | Defence

[3] Missiles, AI, and drone swarms: Ukraine's 2025 defence tech priorities - Atlantic Council