Submission to the Senate Standing Committee on Foreign Affairs Defence and Trade: The potential use by the Australian Defence Force of unmanned air, maritime and land platforms

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Australia should wholeheartedly embrace the use of unmanned platforms by the Australian Defence Force. They offer a way to overcome many long standing challenges in Australian defence policy and maintaining key vital advantages such as a capability edge. A knowledge of these systems will also be important for reducing the risk posed by this technology in the hands of opposing forces or groups. However fresh thinking about procurement and purpose will be required to ensure efficient and effective use of these platforms is required.

Australia's defence challenges

Australia is an extremely difficult country to defend. The sparse population of the nation has been a constant source of concern in Australian defence planning.[1] The nation's territory is also extremely difficult for forces to move through or spend significant time in. This includes both continental Australia, as well as the nation's extensive ocean claims. Australia therefore needs to find ways to enable 0.3 per cent of the world's population to understand, manage and protect more than 10 per cent of the world's surface.

Australia has tended to resolve this problem through close alliance relationships with a major partner, solid population growth and maintaining a capability edge in military equipment. However none of those strategies can be entirely relied on long term. A form of self-reliance has been central to Australian strategic policy since the early 1970s and is likely to grow rather than contract, especially regarding the emergence of non-traditional security challenges. Regional demographic forces mean that the nation will have to be content 'Living with giants'[2] rather than being one of them. In turn, the development and economic growth of our neighbours has significantly reduced Australia's technological advantage within existing capabilities. Unmanned platforms, if designed intelligently offer ways to address many of Australia's core defence challenges.

Design Philosophy

This submission calls for a general embrace of unmanned systems by the Australian Defence Force and Australian government. However there are some underlying design philosophies that should guide that embrace.

First, any purchases should be fit for purpose, that is sought to achieve specific and long lasting defence challenges facing Australia, rather than on the basis of availability, interoperability or the mere allure of new technology. There is always a temptation to make decisions based on products rather than need and with the proliferation and appeal of unmanned platforms this is a clear risk.

Second, Australia should look for unmanned systems that can complement existing force structure arrangements. From shoulder launched systems for troops in the field, to underwater/surface

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[1] See *Australian Strategic Basis Papers* – 1947 p.69; 1953, p.53; 1956, p.14; 1959, p.49; 1962; p.69 etc. All page numbers taken from Stephan Fruhling, '*A history of Australian strategic policy since 1945*', Canberra, Commonwealth of Australia, 2009. http://www.defence.gov.au/strategicbasis/pdf/consolidated.pdf

[2] Coral Bell, '*Living with Giants: Finding Australia's place in a more complex world*', Canberra, Australian Strategic Policy Institute, 2005. https://www.aspi.org.au/publications/living-with-giants-finding-australias-place-in-a-more-complex-world

systems that are released from or work in cooperation with existing manned platforms. If choices have to be made between these domains, the author would recommend a focus on maritime systems. The nature of Australia's largely maritime domain, 'air-sea gap' concerns and emergent maritime strategy[3] speak to a need for underwater/surface unmanned systems. While maritime systems are currently far less developed than aerial systems, the technology is rapidly expanding.[4] Such systems could help protect and expand the capacity of Australia's submarine and surface fleets, offer remote surveillance, static and mobile elements and enticingly— given the trend of regional arms purchases— offer promising new Anti-Submarine Warfare (ASW) options.[5]

Third, Australia should focus on smaller single-purpose 'swarm' technologies rather than multiple-purpose mega systems. To put it in the words of one report on defence technology: It should buy more R2D2's and less Death-Stars.[6] As we do not know how the technology will develop, a focus on purpose and processes rather than platforms is important.[7] Given the cost, scarcity and appeal of unmanned systems, there is a temptation to add additional capabilities such that they can be used in multiple ways. However, as seen with the development of the F-22 or F-35, this introduces significant risks and costs. With emergent technologies like unmanned platforms however, a focus on quick development, testing and replacement is critical until the ADF gains mature knowledge of how best to use these systems.

Finally, this approach requires substantial engagement with Australia's civilian and commercial sectors. The knowledge, research, innovation and experience gained by civilian use of unmanned systems will be critical for the advanced use of these systems by the ADF. This means there is a defence need for a relatively free and lightly regulated civilian environment for unmanned systems. While balancing public safety and privacy is important, the national need to understand and develop a healthy commercial sector with these technologies should be part of national decisions.

Australia should also look to development/training integration with its ASEAN neighbours. We share many security challenges which unmanned systems will assist with — tackling organised crime, counter-terrorism, natural disasters and regional security awareness. Southeast Asia also possesses a very different and often difficult environments, yet one that is vital for ADF capabilities to operate smoothly in. ASEAN countries may also offer potential manufacturing bases if it is judged too inefficient to support an Australian domestic industry (though this will require serious analysis first and should not be abandoned lightly). While Australia should try and encourage a substantive Research and Development base to encourage local innovation, scholars have demonstrated that countries which are willing to experiment, learn and change to embrace new military technology can often outperform the original innovators.[8] Thus a philosophy of innovation in the ADF may be more important than an innovative industry at home for Australia's national security needs.

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[3] Justin Jones, '*A Maritime School of Strategic Thought*', Canberra, Department of Defence 2013. http://www.navy.gov.au/spc/sites/default/files/publication-documents/Combined%20%28web%29_0.pdf

[4] Bryan Clark, *The Emerging Era in Undersea Warfare*, Centre for Strategic and Budgetary Assessments, 2015. http://csbaonline.org/publications/2015/01/undersea-warfare/

[5] For a discussion of the need for ASW in Australian defence planning see Andrew Carr, 'A New Flank: Fresh perspectives for the Defence White Paper', *Centre of Gravity*, Canberra, ANU, 2013, p.8-10.

[6] Andrew Davies, '*Graph of the week: the high cost of high costs'*, The Strategist, Australian Strategic Policy Institute, 2014. http://www.aspistrategist.org.au/graph-of-the-week-the-high-cost-of-high-costs/

[7] Aaron Martin and Ben FitzGerald, '*Process Over Platforms A Paradigm Shift in Acquisition Through Advanced Manufacturing'* Centre for a New American Security, 2013. http://www.cnas.org/sites/default/files/publications-pdf/CNAS_ProcessOverPlatforms_FitzGerald.pdf

[8] Michael C. Horowitz, '*The Diffusion of Military Power: Causes and Consequences for International Politics'*, Princeton University Press, 2010.

Risks

There are serious challenges with the adoption of unmanned platforms. Currently, these systems have personnel requirements that are often higher than manned systems. [9] They can also be far more expensive than their unmanned nature may suggest — which may encourage more overloading and in turn greater costs and longer development cycles. There is also the need for a significant support infrastructure from replacement parts and machines (given their higher rates of failure), along with often enormous communication needs across radio and data links.

How these platforms feed into the national C4ISR (command, control, communications, intelligence, surveillance, reconnaissance and electronic-warfare elements) is vital. While the vast majority of unmanned systems are not armed, there are significant political, legal and ethical implications to consider before moving towards armed systems. Who will be given authority to target or act, particularly once autonomous targeting becomes viable? Given the clear public concern about assassinations conducted by the United States as part of the War on Terror, how does Australia make clear it has different rules of engagement and principles?[10] Focusing on smaller and maritime unmanned platforms would help alleviate some of the public perception problems for the short to medium term.

Consideration must also be given to how the technology will be perceived by audiences, both at home and in the operating theatre, and popular opinion as well as policy maker's attitudes. One notable and under-discussed issue is that unmanned systems may face a lower strike threshold with countries more willing to shoot down unmanned platforms in contested territory.[11] Clear discussion of the acceptable norms regarding these systems will be vital, not only for Australian interests but as an issue to lead discussion on in our region.

Conclusion

Ultimately, Australia has no choice but to join the unmanned revolution in military affairs. But we should also strongly welcome it, as offers the potential to fundamentally overcome some of biggest defence challenges Australia faces. Used sensibly, it will expand the capacity of and better protect troops in the field, provide Australia a far greater knowledge of the regional security environment, and develop counters to emerging security threats (especially in the maritime zone). The biggest challenge will be ensuring that the right design philosophy is used to consider Australia's approach. In the words of one respected security analyst 'dramatic improvements in the fields of robotics, artificial intelligence, additive manufacturing, biology, and nano-materials are changing the cost/effectiveness calculation in favor of the "small, smart and cheap" against the "few and exquisite but extremely expensive"'.[12] This is ideal situation for a middle power nation, with a small population, vast continent, advanced economy and strong industry and technology sectors.

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[9] Shashank Joshi & Aaron Stein, 'Emerging Drone Nations', *Survival: Global Politics and Strategy*, Volume 55, Issue 5, 2013, p.56.
[10] Australian Defence Force Publication 3.14 *Targeting, 2009*
http://www.defence.gov.au/foi/docs/disclosures/021_1112_Document_ADDP_3_14_Targeting.pdf
[11] Sarah Kreps and Micah Zenko, 'The Next Drone Wars', *Foreign Affairs*, March/April 2014.
[12] T.X Hammes, 'Future War: Why Quantity Will Trump Quality' *The Diplomat*, 20 November 2014.
http://thediplomat.com/2014/11/future-war-why-quantity-will-trump-quality/