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AUSTRALIAN DEFENCE FORCE

CONCEPT FOR ROBOTICS AND AUTONOMOUS SYSTEMS 2040

AUTHORS BRIEF

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Introduction

1. Force Exploration Branch has been directed to develop a concept that addresses Robotics and Autonomous Systems within the ADF future operating environment.

Title

2. The title of this concept is: *Australian Defence Force – Concept for Robotics and Autonomous Systems 2040* (ADF-CRAS 2040).

Lead author

3. The lead author for this concept is Force Exploration Directorate, Joint Concepts.

Aim

4. The aim of the ADF-CRAS 2040 is to describe how the joint force will address the challenges and opportunities provided by Robotics and Autonomous Systems, in the Future Operating Environment.

5. The ADF-CRAS 2040 will be used to coordinate capability managers' implementation of RAS into existing programs, with a focus on linking policy to employment. Force design will utilise this concept in conjunction with the DCAP to identify gaps and opportunities specific to RAS. Additionally, the concept will be utilised for experimentation, professional military education, and ongoing FVEY concept development.

Military problem

6. The character of war is changing with the adoption of emerging and disruptive technologies. As these technologies become more available and affordable, the gap between well-equipped militaries and the motivated individual or group (with a cause) is closing. Therefore, sustaining and maintaining a technological edge over potential adversaries is becoming more challenging.¹

7. The ADF-CRAS 2040 is to address the military problem of:

The future operating environment will see a significant proliferation of robotic and autonomous systems amongst state and non-state actors. RAS will be employed by state and non-state actors in offensive and defensive capacities to provide lethal and non-lethal

¹ Robotic and Autonomous Systems Strategy, Australian Army, October 2018

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effects. Enabled by the Internet of Things, RAS will likely be employed in large numbers, across dispersed dispositions, and unattributable.

The proliferation of RAS will challenge more traditional ADF capabilities. However, these systems also present opportunities for the ADF future force to experiment with their use within future capability systems to solve the problem of presence across a broad array of domains.

How will the ADF future force exploit RAS to gain advantages throughout the spectrum of conflict, and how can the ADF counter threats posed by RAS to the future force?

8. The author is to consider (but is not limited to):
 - a. The strategic context of RAS within the ADF
 - b. Definitions specific to RAS (levels of autonomy)
 - c. How the ADF future force can exploit RAS opportunities to gain an advantage over an adversary
 - d. How the ADF future force can counter threats posed by RAS
 - e. Complementary technologies

Timeline

9. The indicative timeline is as follows:
 - a. 15 Aug 19: Endorsed author's brief for ADF-CRAS 2040.
 - b. Oct 20: Presentation to committee.
 - c. NLT 20 Nov 20: Publish.

Stakeholder engagement

10. As the lead for the coordinated ADF-CRAS 2040 effort, Force Exploration Branch is to consult widely across the ADO. It is expected that Force Exploration Branch will consult widely outside of the ADO, with a specific focus on engaging industry, academia and think-tanks.

11. As this task was endorsed by the ETRG, Force Exploration Branch requests assistance from the branches represented at ETRG. If further assistance is required, DGFE will consult with the relevant ETRG principal.

Security classification

12. The ADF-CRAS 2040 is to be classified no higher than SECRET, with an effort to be made to keep as much material at UNCLASSIFIED to enable collaboration with non-defence stakeholders (industry and academia).

Related publications

13. The following publications (whilst not exhaustive) will provide the key reference material for the development of the ADF-CRAS 2040:

- a. The Joint Concepts Framework
- b. Joint Concepts Framework Handbook
- c. Five-Eyes Future Operating Environment 2040
- d. ADF Future Operating Environment 2035
- e. Robotic & Autonomous Systems Strategy (Australian Army, Oct 18)

Style

14. The ADF-CRAS 2040 is to be written as per the guidelines established within the Joint Concepts Framework Handbook.

Structure

15. The structure of the ADF-CRAS 2040 is to indicatively look as follows:

- a. Front matter: Title page, objective file reference, coordination and endorsement dates, amendment record, JFA signature block, contact details for lead author, table of contents.
- b. Section 1: Strategic context for RAS in the FOE.
- c. Section 2: Defining and explaining the military problem.
- d. Section 3: RAS opportunities – How the ADF future force can exploit RAS opportunities to gain an advantage over an adversary
- e. Section 4: Counter-RAS – How the ADF future force can counter threats posed by RAS
- f. Section 5: Implementations (DCAP recommendations for RAS gaps and opportunities, FIC analysis)
- g. End matter: Glossary/abbreviations, references, consultations.

Conclusion

16. The ADF-CRAS 2040 will build on the initial counter-RAS concept note (reference C), to identify ways for the ADF future force to exploit RAS opportunities, and to counter RAS threats. The concept will involve a large stakeholder audience, both in and outside the ADO, and will be subject to thorough experimentation which will enable the concept to provide recommendations through DCAP annual gaps and opportunities.