



AIR DOMAIN WAR-GAMING: SYNCHRONISATION ACROSS THE PROCUREMENT DIRECTORATES

Anonymous

JCSP 50

Service Paper

Disclaimer

Opinions expressed remain those of the author and do not represent Department of National Defence or Canadian Forces policy. This paper may not be used without written permission.

© His Majesty the King in Right of Canada, as represented by the Minister of National Defence, 2024.

PCEMI n° 50

Étude militaire

Avertissement

Les opinions exprimées n'engagent que leurs auteurs et ne reflètent aucunement des politiques du Ministère de la Défense nationale ou des Forces canadiennes. Ce papier ne peut être reproduit sans autorisation écrite.

© Sa Majesté le Roi du chef du Canada, représenté par le ministre de la Défense nationale, 2024.

CANADIAN FORCES COLLEGE - COLLÈGE DES FORCES CANADIENNES

JCSP 50 - PCEMI n° 50
2023 - 2024

Service Paper – Étude militaire

**AIR DOMAIN WAR-GAMING:
SYNCHRONISATION ACROSS THE PROCUREMENT DIRECTORATES**

Anonymous

“This paper was written by a candidate attending the Canadian Forces College in fulfilment of one of the requirements of the Course of Studies. The paper is a scholastic document, and thus contains facts and opinions which the author alone considered appropriate and correct for the subject. It does not necessarily reflect the policy or the opinion of any agency, including the Government of Canada and the Canadian Department of National Defence. This paper may not be released, quoted or copied, except with the express permission of the Canadian Department of National Defence.”

« La présente étude a été rédigée par un stagiaire du Collège des Forces canadiennes pour satisfaire à l'une des exigences du cours. L'étude est un document qui se rapporte au cours et contient donc des faits et des opinions que seul l'auteur considère appropriés et convenables au sujet. Elle ne reflète pas nécessairement la politique ou l'opinion d'un organisme quelconque, y compris le gouvernement du Canada et le ministère de la Défense nationale du Canada. Il est défendu de diffuser, de citer ou de reproduire cette étude sans la permission expresse du ministère de la Défense nationale. »

AIR DOMAIN WAR GAMING: SYNCHRONISATION ACROSS THE PROCUREMENT DIRECTORATES

AIM

1. This paper aims to highlight the need for a synchronized air domain gap and opportunities development process for Air Force Headquarters (AFHQ) to procure future capabilities. Wargaming and integrating these capabilities, including modeling and simulation (M&S) *external* to the Joint Experiment Directorate (JED), is required. This will allow the execution of the process at the appropriate classification level and provide more relevant, credible, and valid information to inform the air domain procurement procedure and the joint force wargaming of theatre concepts. Air power is a building block of an integrated force and most effectively contributes to campaigns and operations when integrated.¹ AFHQ must first work on effectively integrating its future force in collaboration with joint force requirements.

INTRODUCTION

2. This paper is due to the identified ever-growing complexities with new capabilities,² the lack of understanding of these capabilities, how the air domain integrates into the joint force, and overall awareness of the direction air power is headed. It needs to be looked at through the lens of a system of systems (SoS).³ The lack of synchronization across AFHQ directorates has made it difficult to understand, from a capability aspect, how they integrate and what future projects are required to achieve the desired joint force objectives, including sustainment requirements.

3. This paper will first discuss the Directorate of Air Combat Capability (DACC) approach to providing gaps and opportunities to project officers and argue that this method is the best way to standardize the directorates across the air domain. It will then be highlighted that a synchronized effort should be incorporated directly under the Head of Air Capability (HAC) to ensure the air domain is integrated and informed across the capabilities to provide JED with concise capability information for integration into the future Joint Force.⁴ It will discuss the benefits of a holistic approach in wargaming, including modeling and simulation (M&S) for analytical purposes in the procurement strategy. This strategy will look at an SoS methodology inclusive of a focus on the war functions in the approach to future warfighting capabilities. It will conclude by recommending a cause of action to fully integrate this DACC's new process across air domain capabilities, aligning projects to focus on needed capability effects of our future force in a concentrated and integrated approach.

¹ ADF Department of Defence, 'ADF-I-3 ADF Air Power Ed 1 (1)', 1st ed. (Directorate of Information, Graphics and eResources Doctrine Directorate, 2023), 2.

² ADF Department of Defence, 20.

³ ADF Department of Defence, 11.

⁴ ADF Department of Defence, *National Defence: Defence Strategic Review* (Commonwealth of Australia, 2023), 50.

DISCUSSION

4. DACC has implemented a wargaming process that produces the highest analytical data possible. This has been problematic in the past due to unknowns and misinformation. Due to the majority of DACC capabilities being held at a higher classification, this process allows accurate capability information to be analyzed and integrated with other capabilities to ensure they will serve the ADF in the future strategic environment.⁵ The process focuses on producing identified gaps and opportunities for directed and conceptual wargaming following the Australian Defence Force's "Integrated Campaigning for Deterrence."⁶ The process is called Air Combat Integration (ACI), and DACC seeks to expand to include all capabilities under HAC, including a few external whole of government (WOG) capabilities.⁷ ACI has been executed multiple times with impressive outcomes, delivering credible information to project officers within DACC. This information was fed into the JED games and analysis process, enhancing joint awareness of air domain capabilities.

5. ACI execution has highlighted that there needs to be more integration in the air domain's future capabilities to understand the trajectory of air power. This lack of integration hinders AFHQ's ability to produce effective capability effects for directed guidance.⁸ Multiple projects and a lack of resources to develop projects have led to a stressed system under HAC. This has resulted in project officers resourcing contractors to deal with the daily demand of administrative work and to increase horsepower in project development. The larger workforce has created an unsynchronised approach to identifying air domain gaps and opportunities. This can be achieved through a more comprehensive analysis by synchronizing efforts to understand gaps and opportunities by integrating project resources. Furthermore, the act of combining resources and implementing the ACI model is sure to yield even more favorable results. This collaboration and adoption of the ACI model will bring about several other positive side effects that we will now delve into.

Aligned threat-based approach in procurement.

6. Intelligence members from DACC have been progressing on a standardized process to collate threat information for ACI wargaming and M&S. When standardized amongst the large procurement workforce under HAC, this threat-based approach will help air domain focus on the capabilities required to meet the air domain obligations of joint force objectives.⁹ It will further alleviate strong subjective opinions from shaping the narrative around a project's vector.

⁵ ADF Department of Defence, 50.

⁶ Australian Department of Defence, 'ADF Capstone Concept: Integrated Campaigning for Deterrence', 2nd ed. (Joint Concepts, 2024), 11.

⁷ ADF Department of Defence, *National Defence: Defence Strategic Review*, 32.

⁸ Australian Department of Defence, 'ADF Capstone Concept: Integrated Campaigning for Deterrence', 15.

⁹ ADF Department of Defence, 'ADF-I-3 ADF Air Power Ed 1 (1)', 15.

7. Adopting a threat-based approach is crucial to the work of future force capabilities. However, not following a formal procedure and using an unsynchronized approach can lead to subjective opinions and challenges. To avoid this, it's essential to have a well-coordinated strategy that ensures objectivity and effectiveness. This is something a DACC's ACI process can take the lead on.

8. Intelligence reports are crucial sources of information, but they have limitations. The reports can only provide known information at the time, and their future projections rely on a limited capability vector. Considering these constraints while evaluating intelligence reports and drawing conclusions is essential. Procurement planning of air domain capabilities historically lies in the seven-to-nine-year time frame, and using a threat-based approach is challenging due to the requirement of *estimating* threat capabilities in this epoch. A playbook of threat estimates is required so project officers can leverage this information for contestability in design. This paper highlights this challenge due to the observed subjective opinions on threat estimates. This has led to an inconsistent threat baseline where the expanded workforce has made it difficult to synchronize its approach and requires an overarching procedure.

9. As the overarching procedure, ACI would be responsible for liaising with JED threat analysts, the intelligence community, and directorate leads to combine a focused air threat-based playbook that all the projects within the air domain must use. As this would be focused on air domain threats, a more rigorous analysis of the threat capabilities can be explored against the project's capabilities. This would not typically be explored during large JED wargame execution due to time factors and classification. This will enable a better analytical approach to assist in the development and contestability of Joint Capability Need Statements (JCNS).

Vignettes focused on Joint Force mission objectives.

10. Air domain vignettes should be focused on deduction mission sets from the joint force employment concepts and direction.¹⁰ JED wargaming activities cannot focus on the analytical data needed to truly understand what gaps in air capability exist at the very tactical level and what opportunities it can provide in an asymmetric sense. JED wargames are too large in scale and can't focus on the details required in a technically advanced domain like the air domain. In addition, the electronic warfare aspect is hard to measure for effects in desktop wargaming, requiring significant background work.

11. The classification of capabilities and capacity of the workforce is generally the limiting factor; the ACI process, however, aims to execute at the right level and break the information down to a helpful level. The outcomes of effects are then presented to JED activities having already been studied. The two high payoffs of having ACI execute vignettes under HAC outside of joint force are two-fold: the obvious for the directorates, as stated in this paper, is that being a synchronized approach better informs air domain, but also JED wargaming activities that air domain subject matter experts attend can

¹⁰ Australian Department of Defence, *ADF Concept ASPIRE*, 2nd ed. (Joint Concepts, 2023), 13.

provide instant information on capability effects. This will be done at the appropriate classification level where, if not done prior, it would not have been spoken to. This enhances the JED activity schedule and better informs the joint force of the ADF's military capabilities.

Air ISR contributes to Intelligence and is a critical enabling capability.

12. The Air Force has an existing information collection capability and is pursuing even more advanced capabilities. The ability to sense and fuse information and data transfer in future warfare is becoming critical and challenging in the future force against potential adversaries. The more advanced RAAF capabilities are becoming, the more reliant they are on an ability to sense and communicate.¹¹ Looking at this future threat, it is apparent that more than one capability will be needed to enable air domain and joint force objectives. It must be a robust and fully integrated machine with many avenues of source that all need to be fused. The challenge the Air Force has faced is that ISR has become its own entity that could be viewed as separate from other directorates within the air domain instead of its core role in enabling them.

13. As more projects that require heavy investment in the integration and fusion of data are coming online, there needs to be a collaborative approach to understanding what capabilities each has and how they complement the required ISR picture. They need to be reliable and can operate in a contested electronic spectrum. These capabilities must be integrated early in the project phase and analyzed through a process such as ACI. It will enable capabilities to leverage other projects' requirements for potential funding, ensure each capability with a sense function can be fused, and identify gaps and opportunities within the vignettes for execution.

Command, Control, Communications, computers, and architectures

14. The ADF has lived a period of luxury in recent years where conflicts in Iraq and Afghanistan offered permission air environments and uncontested use of the electronic spectrum for communication and other capabilities. This has led the ADF to a false sensation felt by commanders in how they will control future conflict. In many conflicts nowadays and in the future, these areas are now contested, and senior leaders cannot command from operation centers. Procedures and training of decentralized C2 in warfighting are required to prepare the force.¹² Without an appropriate synchronized process that looks at the EW spectrum in the wargaming of concepts, understanding what is survivable and what isn't is crucial in preparation and reducing integration complexity.¹³

15. As the reliance on satellites has grown, so too has the ability for it to be degraded. Simple capabilities such as communicating anywhere globally in recent years have the potential to set the ADF's future force up for failure. Communication systems, datalinks,

¹¹ ADF Department of Defence, 'ADF-I-3 ADF Air Power Ed 1 (1)', 40.

¹² ADF Department of Defence, 46.

¹³ ADF Department of Defence, *National Defence: Defence Strategic Review*, 67.

and all other capabilities operating on the electronic spectrum must be analyzed for survivability and integration across the air domain and into the joint force. ACI can begin looking at the electronic spectrum within the assigned vignettes and produce an analysis. HAC must understand what the ability is going to be to control our future force in contested environments, highlighting what force structure and training will be required.

Kinetic and non-kinetic capabilities require an integrated approach.

16. The ACI process within DACC has primarily focused on kinetic and non-kinetic attacks to date, and it is evident that ACC platforms and weapons heavily rely on other capabilities outside of DACC to be effective. This has created a challenging situation for DACC, where a requirement for its own capabilities and effectiveness lives in another directorate. Coordinating all air domain capabilities en masse to effectively combat the enemy is complex and requires precise planning and execution. This planning and integration need to happen at the procurement and development stage.

17. Integration and early collaboration are crucial so the air domain capabilities are integrated as best they can with the technology available.¹⁴ This will alleviate the operational force at a later stage to work through integration issues when the capability has been delivered. This can start through a process like ACI that brings all projects together for a collaborative, synchronized approach to capability procurement. By collaborating with other projects across the domain, M&S can execute to validate further the analytical data identified during wargaming. This, by virtue, gives credibility to the identified gaps and opportunities and can help in the contestability phase of procurement.

Integrated Sustainment analysis

18. Logistics is critical to Australia's air power capability, and like all other domains, it is challenged to meet the demands of the current fighting force and the future. Australia is a large island, and the Northern part is predominantly remote, with only a handful of operating bases for air. It presents difficulties for the ADF in its sustainment of forces and the nation's defense.¹⁵ Logistics must be a vital component of the ACI process across the air domain. Logisticians need an operational view of the future fight for the air domain at the highest detail to force structure appropriately to enable force when it arrives.¹⁶ The ACI can embed logisticians into the process, further enhancing the overall knowledge of where air power is headed to provide that focused guidance that would not typically be achieved at joint equivalent processes.

19. It is argued that logistics should be leveraged more regarding wargaming and concept designs within AFHQ. By having a single source for vignettes, capabilities, threats, gaps, and opportunities that are collaborated with a joint force, Air Force logisticians can more accurately synchronize what it needs amongst all the projects instead of individually addressing each project. This will consolidate a large amount of

¹⁴ ADF Department of Defence, 54.

¹⁵ ADF Department of Defence, 75.

¹⁶ ADF Department of Defence, 81.

information into a common package from which they can pull data to build their capability and force structure.

CONCLUSION

20. This paper highlighted the growing complexities in identifying gaps and opportunities for the air domain's future capabilities. DACC has taken the initiative to develop a stand-alone process, ACI. It has the procedures, experience, and ability to lead an overarching and governed role to synchronize the directorates to common threat baselines and vignettes. Bringing the workforce together under this governed role will eliminate subjective opinions on threat baselines and vignettes. Instead, they will be informed, critiqued, and closely aligned with JED activities to keep air domain capabilities focused on joint force needs. By synchronizing the directorates, a more effective and efficient approach can be taken to understand the critical functions of the Air Force's future warfighting capabilities. C4, sustainment, and kinetic and non-kinetic effects all require integration, which must happen early in the development and procurement stage. By adopting the ACI process directly under HAC and resourcing it appropriately from the directorates, a collaborated and integrated approach can be taken to procurement, informative to commanders and the Joint Force.

RECOMMENDATION

21. It is recommended that an ACI process be stood up directly under HAC and led by an experienced member from DACC. This member will be charged with synchronizing efforts in wargaming and M&S to produce integrated gaps and opportunities of air domain capabilities. They will also be responsible to HAC for close coordination with JED and other joint areas that require air domain capability awareness. A standardized threat playbook for appropriate epochs that guides all projects in wargaming is to be developed. Vignettes must be aligned with JED activities but focused on air domain capabilities to enhance the analytical information generated.

BIBLIOGRAPHY

Australian Department of Defence. 'ADF-I-3 ADF Air Power Ed 1 (1)', 1st ed. Directorate of Information, Graphics and eResources Doctrine Directorate, 2023.

Australian Department of Defence. '*National Defence: Defence Strategic Review*'. Commonwealth of Australia, 2023.

Australian Department of Defence. 'ADF Capstone Concept: Integrated Campaigning for Deterrence', 2nd ed. Joint Concepts, 2024.

Australian Department of Defence. *ADF Concept ASPIRE*. 2nd ed. Joint Concepts, 2023.