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Integrating Into Combined Space Operations: Implications for Canadian Space Policy

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**INTEGRATING INTO COMBINED SPACE OPERATIONS:
IMPLICATIONS FOR CANADIAN DEFENCE SPACE POLICY**

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INTEGRATING INTO COMBINED SPACE OPERATIONS: IMPLICATIONS FOR CANADIAN DEFENCE SPACE POLICY

*“In this environment, cooperation amongst nations is not just a nice-to-have,
it’s a necessity.”*

- General John Raymond, Commander, Air Force Space Command¹

INTRODUCTION

The projection of power from space is a relatively new concept for the Department of National Defence (DND) and the Canadian Armed Forces (CAF). Historically, these institutions have concentrated on promoting the peaceful use of space and the development of international responsible norms and behaviours. However, since 2014, United States (U.S.) policymakers have been openly talking about preparing for war in space and labelling space a warfighting domain.² This message was reinforced when the U.S. released its 2018 National Space Strategy which had a more aggressive tone, and concluded that alliances and partnerships were needed to provide an advantage over rivals.³

This shift in U.S. focus requires DND/CAF to re-visit past assumptions and update or create new policies. This requirement became clear when an explicit statement on the importance of, and their intention to, protect military space assets, while concurrently developing responsible norms and behaviours, was written into the 2017 defence policy Strong, Secure, Engaged (SSE) in 2017.⁴

¹ Michael Gleason and Charity Weeden. “Alliance Rationales & Roadblocks: A U.S.-Canada Space Study”, The Aerospace Corporation Center for Space Policy and Strategy, April 2018, pg. 4.

² Victoria Samson and Brian Weeden. “Global Counterspace Capabilities: An Open Source Assessment”, Secure World Foundation, April 2020, pg. 3-20.

³ *Ibid*, pg. 3-21.

⁴ Michael Gleason and Charity Weeden. “Alliance Rationales & Roadblocks: A U.S.-Canada Space Study”, The Aerospace Corporation Center for Space Policy and Strategy, April 2018, pg. 7.

DND/CAF are now at a crossroads; either press forward with maximum efforts to implement the aggressive space power initiatives laid out in SSE and position themselves to continue being a valued-added international partner, or accept a diminishing international role. The institution is attempting to move forward with the latter; however, in order to be successful, must first agree upon, and update, their space related policies.

Specifically, DND/CAF must agree on how they will react to aggressive and threatening activities in space, and continue operating in a denied environment.⁵ Should policies and doctrine not be updated quickly, many SSE initiatives, including those related to combined space operations, may fail as a result of SSE charting a too aggressive path without first ensuring policy coverage at all levels. Should this be realized, DND/CAF may lose a golden opportunity to significantly enhance their international reputation as a true value-added partner for combined space operations.

This paper first provides an overview of space initiatives in SSE, analyzes combined space operations efforts and the organizational and personnel impacts they are having on DND/CAF, and finally analyzes the implications this has on Canadian defence space policies. To aid in the analysis, the paper assesses whether the results from a recent study performed by the Aerospace Corporation's Center for Space Policy and Strategy on rationales and roadblocks to a U.S.-Canadian space alliance, have been incorporated.⁶

STRONG SECURE ENGAGED SPACE INITIATIVES

The space domain is rapidly becoming congested, competitive, and contested; congested due to the rapid increase in the number of objects and radio frequency spectrum demand from

⁵ Charity Weeden. "Strong, Secure, Engaged in a Threatened Space Domain", Canadian Global Affairs Institute, May 2018, pg. 1.

⁶ This study concluded the main barriers to this alliance are legal and policy, organizational, technological, budgeting, and cultural

outer space, competitive both between nation states and between commercial entities competing for global contracts, and contested due to the growth of defensive weapons being tested. New and updated space policies by all Five-Eyes (FVEY)⁷ partners are needed to not only solidify their government's position on critical issues such as offensive and defensive doctrine, but also to provide an overall assessment of each allies comfort level operating in space. DND/CAF began this process with the release of its SSE policy in 2017.

SSE has now become the main document of reference for space initiatives.

Unfortunately, it provides high-level strategic policy guidance only, and as such is mainly useful as an initiating document. All other defence-related space policy and doctrine documents must now build upon this foundation.

Although Canada is today the only FVEY country providing an on-orbit space asset for allied use, its contribution remains very modest.⁸ SSE is attempting to change this and the policy is explicit in the government's position that space assets are considered critical defence assets.

SSE highlights the necessity of deterrence, diplomacy, interoperability, and modernization of space capabilities and has several space-related initiatives.⁹ These initiatives commit DND/CAF to deliver new space capabilities, increase the size and skill of the space cadre, and increase defensive space operations, including a commitment to the combined space operations (CspO)¹⁰ initiative and the defence and protection of military space capabilities.

SSE specifically states that Canada will “modernize its space capabilities and will take steps to protect these critical assets against sophisticated threats, while continuing to promote the

⁷ The term FVEY refers to the alliance between the U.S., Canada, United Kingdom, Australia, and New Zealand

⁸ DND/CAF launched the Sapphire satellite in 2013 as a contributor to the U.S. Space Situational Awareness network

⁹ Charity Weeden. “Strong, Secure, Engaged in a Threatened Space Domain”, Canadian Global Affairs Institute, May 2018, pg. 1.

¹⁰ CSpO is a U.S. led space cooperation initiative involving FVEY partners and France and Germany. It is further described in the following sections

peaceful use of space.”¹¹ Initiative 83 calls for DND/CAF to “defend and protect military space capabilities, including by working closely with allies and partners to ensure a coordinated approach to assuring continuous access to the space domain and space assets.”¹² The direction provided is clear - the Defence Space Program is to ensure they are well placed for combined operations with allies, ensure sovereign space systems are protected, and simultaneously continue promoting the peaceful use of outer space.

The FVEYs community realizes that space is too costly and difficult to go alone. Even with aggressive initiatives such as SSE, countries like Canada will be unable to deliver much value unless interoperability increases, and countries focus on delivering niche capabilities that allies can also benefit from. As such, the U.S. is leading an effort to burden share the cost and resources of developing and executing space operations, and to deter common enemies.¹³ This effort is known as the Combined Space Operations (CspO) initiative and it is greatly influencing how the Canadian defence space program is evolving.

THE COMBINED SPACE OPERATIONS INITIATIVE

Unlike the intelligence community, the U.S. national security space community hasn’t worked as closely with allies because they lacked equivalent space policies, doctrine, and personnel to effectively integrate capabilities.¹⁴ In order to address these concerns, the CspO Initiative was created in 2014. This initiative calls for coordination to the maximum extent

¹¹ Government of Canada. Department of National Defence. *Strong, Secure, Engaged: Canada’s Defence Policy*, 2017, pg. 15.

¹² *Ibid*, pg. 72.

¹³ Sandra Erwin. “General Hyten wants more allies to fight alongside in space”. *SpaceNews*, 8 March 2018, pg. 1.

¹⁴ *Ibid*, pg. 3

possible on organization, leadership, capability development, doctrine and concepts, personnel, training, and education, sharing of information, and finally policy.¹⁵

All FVEY partners have signed the CSpO Initiative memorandum of understanding (MOU). This MOU had as its major deliverable the stand-up of the Combined Space Operations Centre (CSpOC) at Vandenberg Air Force Base in California. The CSpOC conducts operations in support of space defence and theater operations, including monitoring space assets and the space environment and creating impact assessments to changes in capabilities. They also provide command and control (C2) support for operations such as missile warning, satellite communications, and all space defence operations.¹⁶ Although Canada currently has a small contingent of personnel working in the CSpOC, an expanded role is possible should policies and doctrine allow. Examples include greater access to ballistic missile defence information, special access programs, and classified space domain awareness data.

The initiative appreciates allies bring their own capabilities and national laws that affect integration. It specifically states it is critical for policy development to “identify extant national laws that may undermine effective combined space operations and work together to harmonize those laws where applicable.”¹⁷ These national caveats must then be incorporated into tasking cycles.¹⁸

¹⁵ Australian Department of National Defence, Department of National Defence of Canada, New Zealand Defence Force, Secretary of State for Defence of the United Kingdom of Great Britain and Northern Ireland, Department of Defense of the United States of America. “Combined Space Operations Initiative MOU”, 2014, pg. 7.

¹⁶ *Ibid*, pg. 3.

¹⁷ *Ibid*, pg. 8.

¹⁸ United States Strategic Command. Memorandum titled “Implementation of Combined Space Operations Center, Initial Operations Capability, Concept of Operations”, 2017, pg. 3.

IMPLICATIONS FOR U.S. INTEGRATION

Integrating DND/CAF's small defence space program with that of the U.S. is challenging and requires prioritizing areas to dedicate limited resources. The Aerospace Corporation's Center for Space Policy and Strategy recently completed some of this work via a study on roadblocks to U.S. and Canadian space alliances. They determined the five major barriers are organizational, technological, budgeting, legal and policy, and cultural.¹⁹ Addressing each of these barriers will be critical to DND/CAF success.

Organizational

In order to strategically place them in a position to rapidly adapt to the evolving space domain, the U.S. recently stood up U.S. Space Force. This signaled to the international community they are prepared to fight a war that extends into space, and intend to quickly and significantly increase their defensive and offensive space capabilities. Several allies including Canada interpreted this move by the U.S. as a call to restructure their own space forces to better align themselves for integrated operations.

Although SSE was released prior to the stand-up of U.S. Space Force, it had the foresight to approve significant increases of personnel to directly support space initiatives. This allowed CAF to plan the stand-up of the 3 Canadian Space Division in the 2022 or 2023 timeframe, including Operations, Support, and Advanced Effects Squadrons. This move will further operationalize space functions across the department, allow them to be more responsive to national and allied demands, provide legitimacy, and create a clearer distinction between Canadian civil and military space programs.

¹⁹ Michael Gleason and Charity Weeden. "Alliance Rationales & Roadblocks: A U.S.-Canada Space Study", The Aerospace Corporation Center for Space Policy and Strategy, April 2018, pg. 2.

Personnel

SSE has placed increasing mission demands on the DND/CAF space cadre which require increased personnel to deliver. It provided funding and direction to augment the space cadre by over 120, although due to lengthy staffing processes, this will take many years to implement.

The direction in SSE appears to have not fully appreciated the limited talent pool available and the significant time it takes to recruit and train personnel. Even with aggressive growth, there is only so much capacity to deliver capabilities and perform operations. DND/CAF also does not have much experience delivering major capital space projects, nor significantly contributing to combined space operations. These risks increase the chances of not being able to deliver SSE's mandate.

Capabilities and Resources

The U.S. has been carrying the majority of the space-based burden sharing load. Due to the rising complexity and cost of delivering space systems, they now expect the international community to help burden share these capabilities. This commitment was formalized by the FVEYs community when the CSpO Initiative MoU was signed in 2014. In order to deliver on this agreement, DND/CAF must be selective in which procurement projects to deliver and look for niche areas where they can contribute more with less.²⁰

SSE calls out several space-related initiatives to assist with integrating into CSpO which require delivery of new capabilities to achieve.²¹ These include the development of a common operating picture to be used within the Canadian Space Operations Centre, as well as major

²⁰ Michael Gleason and Charity Weeden. "Alliance Rationales & Roadblocks: A U.S.-Canada Space Study", The Aerospace Corporation Center for Space Policy and Strategy, April 2018, pg. 6.

²¹ Royal Canadian Air Force. "Canadian Armed Forces Defence Space 5-Year Roadmap", 2016, pg. 6.

capital projects including surveillance of space, protected military satellite communications, and intelligence, surveillance, and reconnaissance (ISR) space assets.

Unfortunately, DND/CAF is being challenged by a lack of experience in delivering large space projects along with limited personnel and financial resources. They are quickly learning how difficult and expensive space is. Canada further has a history of being challenged to deliver space projects on-time and on-budget. For example, the delivery of the Canadian Space Agency led RADARSAT Constellation Mission (RCM), required all departments to provide increased funding, when the original cabinet approved \$600 million budget ballooned to well over a billion dollars.²² While CSA has this experience to learn upon, DND/CAF do not, and should be cautious about trying to deliver too much capability with their first major capital space projects. Even if adequate personnel and funding are provided, without updated policy and doctrine, they will struggle to be implemented and operated.

IMPLICATIONS ON CANADIAN DEFENCE SPACE POLICIES

The Government of Canada released its updated Space Policy Framework in 2019. Aside from making it clear that priority is based on putting Canadian interests first, and making progress through partnerships, it is lacking in defence and security considerations and provides little utility for DND/CAF.²³ Unfortunately, no formal DND/CAF space policy has been released since 1998 and today the relevant documentation is spread upon a number of documents including SSE, the Arctic Framework, Space Power Doctrine, and the RCAF CAF Defence 5 Year Road Map. Some of these are currently in process of being updated while others are not.

²² Dean Beeby. "Launch delayed again for showcase Canadian satellite system". *CBC News*, 15 January 2019, pg. 5.

²³ Canadian Space Agency. "Canada's Space Policy Framework: Launching the Next Generation", 2019, pg. 8.

Evolution of Canadian Space Domain Policies

A research paper released in 2018 by the Canadian Global Affairs institute titled '*Strong, Secure, Engaged in a Threatened Space Domain*', assessed there were four main areas which SSE policy could expand upon with respect to the space domain.²⁴ These were developing an internal understanding of how Canada would react to a war that extended into space, development of a defensive space strategy that could be shared with other CSpO members, creating a space program that ensures there would be no gaps in niche capabilities that allies have become reliant upon, and finally further shaping international norms and behaviours in outer space.²⁵

Some of these topics are addressed in the CAF Defence Space 5-Year Road Map which was developed by the RCAF in 2016 and is currently being updated. This policy states "National Defence actively seeks cooperative opportunities with key allies to augment, leverage, share and protect Canadian and allies Space systems where there are shared interests and dependencies."²⁶ Since this document was released prior to SSE it does not reflect current SSE initiatives and should be updated immediately with known capabilities and timelines.

Legal

There is a lack of rule-of-law framework for operating in space. With national governments no longer being solely capable of launching and operating in orbit, the impact and risk of this realization increases daily.

In order to conduct defensive and offensive space operations in a combined environment, the level of legal risk to DND/CAF needs to be quantified and communicated via policy and

²⁴ Charity Weeden. "Strong, Secure, Engaged in a Threatened Space Domain", Canadian Global Affairs Institute, (May 2018), pg. 3.

²⁵ *Ibid*, pg. 3.

²⁶ Royal Canadian Air Force. "Canadian Armed Forces Defence Space 5-Year Roadmap", 2016, pg. 3.

national caveats. Unfortunately, this area is lacking the most and until updated, will continue to be an impediment to the development of national caveats which are required to fully benefit from CSpO operations.

Part of this legal framework comes from the Remote Sensing Space Systems Act (RSSSA), which regulates earth observation from space for Canada. This is the only dedicated legal document that regulates space activities for Canada and as such it is critically important it remains valid. Since the act was developed in 2005, well before the release of SSE, it needs to be updated. Although this legal document is outside of DND/CAF control, they must reinforce the need to be updated and then align their own policy documents to it. Ensuring the defence and security lens is considered when updating the act will be critical in ensuring it will provide DND/CAF the flexibility to operate effectively within the CSpO construct.

Defensive Space Policy and Operation Olympic Defender

FVEYs members as well as Germany and France recently accepted a U.S invitation to participate in Operation Olympic Defender; Canada accepted in March 2019. This operation has the goal to maintain security of space assets and the space domain and to ensure space-enabled effects. This commitment is forcing DND/CAF to re-look at their limited defensive space doctrine and legal agreements in order to determine national caveats.

Canadian defence and security policy has not always been in-line with that of the U.S., specifically in the areas of defensive posture and the weaponization of space.²⁷ DND/CAF's defensive space policy is lacking on topics such as space C2 and ballistic missile defence, and needs to focus on clearly identifying where there are differing views from U.S. policy. For these

²⁷ Michael Gleason and Charity Weeden. "Alliance Rationales & Roadblocks: A U.S.-Canada Space Study", The Aerospace Corporation Center for Space Policy and Strategy, April 2018, pg. 5.

reasons, DND/CAF must quickly update and further develop their own defensive space policy or risk being pushed into accepting that of the U.S.

The Space Power Doctrine Note released by the Royal Canadian Air Force in 2017 provides basic direction only. It provides common space related definitions, describes the space environment, and defines space power characteristics, principles of employment, functions and activities, and C2 constructs to support joint and coalition operations.²⁸ There are only very limited sections on defensive and offensive operations with the defensive section stating that “Canada ... intends to defend space systems of national interest when threatened. Key to enabling this is the Combined Space Operations initiative.”²⁹ While this doctrine note is a good starting point, it is insufficient to meet CSpO integration demands and needs to be further developed.

CONCLUSION

This paper presented an overview of space initiatives presented in SSE, analyzed the organizational and capability impacts they are having on integrating into combined space operations, and finally analyzed the implications for Canadian defence space policies. Although SSE is not comprehensive in defensive space operations direction, it is clear in its mandate for DND/CAF to work with the U.S. and allies to deter conflict in space.

Due to Canada’s limited space resources, allied partnerships and integration are mandatory for its program to be successful at the international level. CSpO provides this opportunity and areas for reciprocity including cost-sharing agreements, hosting U.S. national security payloads on DND/CAF systems, and data-sharing arrangements.³⁰

²⁸ Government of Canada. Department of National Defence. Royal Canadian Air Force. “Royal Canadian Air Force Doctrine note 17/01: SPACE POWER”, 2017, pg. 2.

²⁹ Ibid, Chapter 3, Section 1

³⁰ Erwin, p. 2

While DND/CAF still have much work to integrate and institutionalize space defence concepts, SSE has raised the priority of space as a warfighting domain. Unfortunately, as this paper has shown, SSE may have over-committed itself on the delivery of space-related initiatives due to a lack of foundational policy and doctrine, and ultimately space-related experience.

Of the five criteria determined as barriers to integration by the Aerospace Corporation study, DND/CAF are only actively addressing the legal and policy, organizational, and technological issues. Budgeting concerns are expected to remain until they accept how costly space is and changing the space culture to be more offensive and defensive minded will take time and require operational experience.

Moving forward, DND/CAF should prioritize updating policy on areas where there are differing views with the U.S. such as offensive and defensive postures and the weaponization of space. This will provide legitimacy to the military space program and help them understand how they would react to a war in space before it starts.

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