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ANALYTICAL WARGAMING: ENABLING OPERATIONAL READINESS

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JCSP 45

Exercise Solo Flight

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Neither a wise nor a brave man lies down on the tracks of history to wait for the train of the future to run over him.

- Dwight D. Eisenhower

INTRODUCTION

The global security environment of the 21st Century is increasingly uncertain, volatile, and fraught with risk. Status quo is being challenged by the emergence of China as a state superpower and potential usurper to the United States (US), the re-emergence of Russia as a major global power and aggressor, and vocal anti-Western states such as Iran and Korea. These adversaries are waging a war “below the threshold” so as to mitigate the competitive advantage enjoyed by US conventional military forces.¹ Political influence, economic coercion, manipulation of social media, cyber and information operations, and military posture are characteristics of this new irregular warfare. Every domain is contested, with conflict unconstrained by state boundaries or principles of sovereignty.²

To successfully defend Canada and Canadian interests, Canada’s Department of National Defence (DND) has produced several documents designed to adapt the CAF’s approach to force posture and readiness. Thus, the CAF’s force posture enables the Government of Canada (GoC) to assess the level of risk in meeting their expectations and the reality of what the CAF is actually prepared to do.³ Page eighty-one of *Strong*,

¹ Gen. Joe Dunford, "Gray zone" warfare, below the threshold of armed conflict, 17 April 2018. Available at: <https://www.youtube.com/watch?v=7RARkBi9xO4>

² Gen. Darren W. McDew, Statement Before the Senate Armed Services Committee On the State of the Command, 10 April 2018. Available at: https://www.armed-services.senate.gov/imo/media/doc/McDew_04-10-18.pdf p4.

³ National Defence Canada, Land Operations 2021: Adaptive Dispersed Operation, Directorate of Land Concepts and Design, Kingston Ontario, 2007.

Secure and Engaged: Canada's Defence Policy (SSE) serves as a summary of this analysis.⁴ The nine missions listed, represent the operational outputs that the CAF must be prepared to meet in service of the GoC. To achieve operational readiness, the Canadian Army's (CA) Managed Readiness Plan (MRP) outlines what resources are allocated to force generators. Currently, the CA MRP identifies three different levels of readiness which facilitates a training cycle that prepares CAF capabilities in line with objectives in a cost effective manner.⁵

Yet even with a significant boost to defence spending over the next ten years, CAF training objectives and criteria for measuring unit proficiency are constrained by time and money.⁶ The unintended consequences are twofold: (1) The Canadian Army (CA) has adopted a "scripted" approach to training, incorporating templates to control injects and tempo for the primary training audience (PTA); and (2) true strengths and weaknesses are camouflaged, preventing the feedback and insight critical to improved performance.⁷ Canada is not alone in this predicament: the US is also reanalyzing its approach to training and operational readiness. This paper will argue that the CAF should revitalize its wargaming capability, specifically focusing on a 'force on force' training philosophy that increases the potential for 'training to failure'. This paper will focus on three areas that support this position. First, it will explore the philosophy that

⁴ Government of Canada, Department of National Defence, "Strong, Secure, and Engaged: Canada's Defence Policy", Copyright Her Majesty the Queen in Right of Canada, 2017, p 81.

⁵ Michael Roi, "Canadian Defence Priorities, CF Force Posture and Strategic Readiness." *Defence R&D CORA Technical Memorandum*, 2012. Three levels of CAF readiness: (1) road to high readiness (RTHR); (2) high readiness (HR); and (3) reconstitution. Available at: http://cradpdf.drddc-rddc.gc.ca/PDFS/unc121/p537113_A1b.pdf

⁶ Government of Canada, Department of National Defence, "Strong, Secure, and Engaged: Canada's Defence Policy", Copyright Her Majesty the Queen in Right of Canada, 2017, p 11. The GoC will grow defence spending over next 10 years from \$18.9 billion in 2016-17 to \$32.7 billion in 2026-27.

⁷ United States 3 year Decision, Action, Training, Environment (DATE) model – used in Computer Assisted Exercises such as the CAF's Ex UNIFIED RESOLVE (a Level 7 exercise within a level 8 environment) and United States' led Large Scale Exercises (LSE).

conflict is non-linear, and that dynamic interaction is essential in creating thinking leaders, capable of critical reflection and growth. Second, this paper will explore the US revitalization of analytical wargames, including the United States Transportation Command (USTRANSCOM) lessons learned as a possible case study. Finally, this paper will present potential CAF 'force on force' wargaming opportunities within live and simulated training. It must be noted that this paper should not be viewed as a criticism of the Canadian Army Doctrine and Training Centre (CADTC) or any other CAF training organization; it merely represents a training philosophy that could compliment CAF doctrine and current practices.

WAR AS A COLLISION OF TWO LIVING FORCES

Within his unfinished work "On War", Prussian military historian Carl von Clausewitz defined war as an interaction that "is not the action of a living force upon a lifeless mass (total nonresistance would be no war at all) but always the collision of two living forces."⁸ This philosophical view of conflict is non-linear, in that at all levels of war there is dynamic interaction that is not just a mere sequence of actions by each opponent, but a pattern of mutually hostile intentions and simultaneously consequential actions. American historian Dr. Alan Beyerchen uses the analogy of a match between two wrestlers, as Clausewitz imagined *Zweikampf* ("two-struggle"), to describe two opponents in war, "body positions and contortions that emerge in wrestling are often

⁸ Carl von Clausewitz, *On War*. Michael Howard and Peter Paret eds. and trans. Princeton: Princeton University Press, 1976, Book 1, p 77. This was in fact one of three definitions of war that Clausewitz offers.

impossible to achieve without the counterforce and counterweight of an opponent.”⁹ It is reasonable to assume that if military commanders are forced to react to their opponent on the battlefield, then training exercises should seek to provoke this same non-linear response. As a philosophy, this is especially applicable to the CAF as it: (1) fields a small regular force military across the full spectrum of operations; and (2) is a learning organization.¹⁰

Small Force and the Spectrum of Operations

The current strength of the CAF is authorized at 101,500 members, which includes approximately 71,500 Regular Force members and 30,000 Reserve Force members. Operational readiness is defined by *Land Operations 2021: The Force Employment Concept for Canada’s Army of Tomorrow* as “the state of preparedness of a unit to perform the missions for which it is organized or designed.”¹¹ This is a challenge onto itself as the CAF, a small military when compared to her allies, is called on to conduct missions across the full spectrum of military operations, from humanitarian assistance and disaster relief (HA/DR), to peacekeeping, to combat. The inherent challenge of having such a wide mandate is that in most cases, mission specific training is done within the 12 months of RTHR training, culminating in certification and deployment. As an example, a HR infantry company training as part of a battle group to deploy to Latvia (Op Reassurance) could also be tasked to conduct a HA/DR mission on short notice. Thus, the time and resources required to target specific Battle Task

⁹ Alan Beyerchen, “Clausewitz, Nonlinearity, and the Unpredictability of War”, *International Security*, 17, no. 3 (Winter 1992-1993): pp 59-90.

¹⁰ For the purpose of this paper, this concept of ‘force on force’ training involves the PTA and an opposition force (OPFOR) who is fighting to win and is unconstrained in terms of imposed limitations and constraints.

¹¹ National Defence Canada, *Land Operations 2021: Adaptive Dispersed Operation*, Directorate of Land Concepts and Design, Kingston Ontario, 2007, p 11.

Standards (BTS) are normally concentrated in controlled exercises designed to illicit an expected and appropriate response from the PTA. The end state is to be declared operational ready. The exercise controller (EXCON) is not trying to win, they are merely going through a process by presenting tactical problems that must be overcome within a set timeframe. Conversely, ‘force on force’ wargaming could be implemented throughout the different levels of operational readiness (over three years), mitigating, to an extent, the resource of time. Commanders and their personnel would be required to outsmart their opponent, to act and counteract accordingly. Ideally, this process would produce flexible and creative CAF leaders who could quickly reorient and deploy across the spectrum of operations.

The CAF as a Learning Organization

The CAF is also a learning organization, yet a scripted approach to training mitigates the value of its lessons learned as true strengths and weaknesses are camouflaged. The ‘After Action Report’ (AAR) process is the CA training tool used to facilitate “learning while doing” and it is incorporated throughout the different phases of training events.¹² The AAR process is governed by the Canadian Manoeuvre Training Centre (CMTC) which collects collective training lessons learned via formal post exercise reports. Yet these lessons learned are arguably “watered down” as the EXCON effectively limits the tempo or pace of training so that the PTA can achieve desired BTS, without becoming overwhelmed. Clausewitz defined “friction” as the only concept that

¹² Government of Canada, Canadian Manoeuvre Training Centre website, available at: <http://www.army-armee.forces.gc.ca/en/canadian-manoeuvre-training-centre/manoeuvre-training-index.page> The AAR phases are (1) Planning Phase; (2) Preparation Phase; (3) Conduct Phase; and (4) Follow-up Phase.

more or less corresponds to the factors that distinguish real war from war on paper.¹³

Therefore a training philosophy that is less scripted and constrained might better prepare Canada's military for the uncertainty and complexity of the contemporary operational landscape. As Clausewitz summarized:

Logic comes to a stop in this labyrinth (war); and those men who habitually act, both in great and minor affairs, on particular dominating impressions or feelings rather than according to strict logic, (they) are hardly aware of the confused, inconsistent, and ambiguous situation in which they find themselves.¹⁴

The CA training system is designed to be a positive experience, where members have the opportunity to learn from their mistakes in a controlled environment.¹⁵

However, while the concept of 'training to failure' is accepted in theory, it is rarely practiced in the CAF due to resource demands (training budgets, maintenance plans, and vehicle mileage) and an aversion to the idea of 'failing'. Swiss military historian Antoine –Henri Jomini argued that the Commander must not accept defeat or expect victory from some other system, "but must try again, using sound principles – massing, attacking, persisting."¹⁶ Clausewitz stressed the importance of this psychological resilience, stating that perseverance supported "a Commanders' ability to withstand the stresses and strains of battle."¹⁷ The revitalization of 'force on force' wargaming would inevitably result in a victor and a loser, thus diminishing the stigma of failure in the CAF. Specific BTS might not be achieved during these wargames, and reality would still impose boundaries and

¹³ Carl von Clausewitz, *On War*. Michael Howard and Peter Paret eds. and trans. Princeton: Princeton University Press, 1976, Book 1, p 119.

¹⁴ *Ibid*, p 580.

¹⁵ Maj. Pete Kilner and Maj. Tony Burgess, *Company Command: Building Combat-Ready Teams*, United States Army, April 2005, p 22.

¹⁶ Peter Paret, *Makers of Modern Strategy: From Machiavelli to the Nuclear Age*. Princeton, NJ: Princeton University Press, 1986, p 152.

¹⁷ Antulio J. Echevarria, "War Is More than a Chameleon" and "Policy, Politics, and Political Determinism." Chapters 3 and 4 in *Clausewitz and Contemporary War*. Oxford: Oxford University Press, 2007, p 170.

constraints (size of the training area, environment considerations) on live exercises – but the less artificiality the better. Innovation thrives in a culture that embraces experimentation and encourages dissent and risk-taking. By forcing RTHR brigades to ‘train to failure’ during level 6 (battle group) or level 7 (brigade) exercises such as Exercise Maple Resolve, the CA would be developing its leaders to be mentally resilient, critical, and self-reflective.

THE US REVITALIZATION OF WAR GAMES

On 8 May 2014, Deputy Defense Secretary Bob Work and Air Force Gen. Paul J. Selva, vice chairman of the Joint Chiefs of Staff, wrote a memorandum to military department leaders and the chairman of the Joint Chiefs of Staff.¹⁸ In their view, the United States was entering a critical period after 13 years of war, with numerous emerging challenges to US global leadership. Their recommendation, which was subsequently accepted and financed, was the revitalization of wargaming as a valuable practice for the US military. The US Department of Defence (DoD) research and lessons learned from their recent efforts (2015-2019) to revitalize analytical wargames such as tabletop exercises, seminars, workshops, and turn-based wargames serves as a viable course of action for DND and the CAF. This paper acknowledges the significant gap between Canada and the US, in terms of their respective population size, Gross Domestic Product, and military budget.¹⁹ Yet despite this difference in terms of scale, the

¹⁸ Cheryl Pellerin, Work: Wargaming Critical in Dynamic Security Environment, Department of Defense News, Defense Media Activity, 11 December 2015. Available at: <https://dod.defense.gov/News/Article/Article/633892/work-wargaming-critical-in-dynamic-security-environment/>

¹⁹ Statistics Times, Projected GDP Ranking (2019). Available at: <http://statisticstimes.com/economy/projected-world-gdp-ranking.php> - Canada (1,820.36) is ranked 10th in the world in terms of GDP with the United States in 1st (21,482.24) (GDP in billions of \$).

generation of ideas, and integration of new technologies into doctrine, operations and force structure are organizationally transferrable. This exploration of US wargaming will focus on: (1) historical precedence; (2) implementation; (3) cost comparison and analysis; and (4) USTRANSCOM as a case study of lessons learned.

Historical Precedence during the Inter-War Years (1920-1939)

The current operating battlespace mirrors the dynamic technological disruption of the inter-war years of the 1920s and 1930s. At that time, technological developments such as radar and sonar, wireless communications, mechanization, aviation, aircraft carriers, and submarines were entering service.²⁰ Planners and theorists leveraged analytical wargaming to better understand how these new technologies could translate to military capabilities on the future battlefield. The US Naval War College was one such organization that proved forward thinking in its application of analytical wargaming. Table-top exercises were integrated into the curriculum, enabling both students and faculty to analyse new concepts “of carrier task force operations, the role of submarines in scouting and raiding, and how to provide logistics support to fleet operations spread over the vast Pacific Ocean.”²¹

The naval aviation community, credited with some of the most innovative pre-war exercises, held workshops and turn-based wargames to explore a wide range of possible

World Population Review, <http://worldpopulationreview.com/> - Canada’s population size is ranked 38th in the world (37, 220, 571) compared to the United States (3rd at 328, 674, 345).

²⁰ DEPSECDEF Bob Work and Gen. Paul Selva, Revitalizing Wargaming is Necessary to Be Prepared for Future Wars, December 8 2015. Available at: <https://warontherocks.com/2015/12/revitalizing-wargaming-is-necessary-to-be-prepared-for-future-wars/>

²¹ DEPSECDEF Bob Work and Gen. Paul Selva, Revitalizing Wargaming is Necessary to Be Prepared for Future Wars, December 8 2015. Available at: <https://warontherocks.com/2015/12/revitalizing-wargaming-is-necessary-to-be-prepared-for-future-wars/>

warfighting futures for aircraft carriers.²² The value of these analytical wargames and exercises manifested during the Second World War. While originally envisioned as operating in support of the fleet battle line, independent carrier operations had been rehearsed at length. Thus, “the US carrier force was ready on day one of the Pacific war, and within six months had inflicted a major, lasting defeat on the superior Japanese carrier force at the Battle of Midway.”²³ The US was not alone in conducting these types of analytical wargaming during the inter-war period. Germany’s transformation of the *Reichswehr* and the development of joint doctrine such as the *blitzkrieg* are testament to the effectiveness and value of analytical wargaming leading up to the Second World War.²⁴

Revitalization and Implementation

The US strategic and operational analytical wargames were designed to incorporate active adversaries, the effects of partners and allies, and the use of disruptive technologies within the operational landscape. Relevant to the CAF, this effort was part of a greater DoD initiative to foster greater innovation, maximize the use of constrained resources, and to avoid operational surprise.²⁵ In 2015, the US DoD took three immediate steps to help restore the fundamental practice of wargaming within the suite of

²² DEPSECDEF Bob Work and Gen. Paul Selva, Revitalizing Wargaming is Necessary to Be Prepared for Future Wars, December 8 2015. Available at: <https://warontherocks.com/2015/12/revitalizing-wargaming-is-necessary-to-be-prepared-for-future-wars/>

²³ *Ibid.*

²⁴ Commonwealth of Australia, Australian Army Journal, Volume IX, No. 3, Summer 2012. Major (AUS) Ben McLennan supports these findings with his analysis of *Generaloblast*, Hans Von Seeckt’s philosophy of ‘train better, fight best’ which transformed the *Reichswehr* during the inter-war years of the 1920s and 1930s. German wargaming focused on developing the *Reichswehr* into a ‘leader’s Army’ or *Fuhrerarmee*, and created thinking soldiers capable of critical reflection and intellectual development. Available at: https://www.army.gov.au/sites/g/files/net1846/f/aa_j_2012_3.pdf

²⁵ Heath, Garret and Svet, Oleg, We Run Wargames Programs for the Joint Staff: Here’s What We’ve Learned. Modern War Institute, 19 October 2018. Available at: <https://mwi.usma.edu/run-wargames-programs-joint-staff-heres-weve-learned>

analytical approaches used by the US military, and to better communicate the subsequent lessons learned to senior defence leaders.

First, a wargaming repository was established where all services, combatant commands and wargaming centres could contribute their results from wargames and tabletop exercises. The purpose was threefold: (1) to better understand and guide current wargaming efforts; (2) provide a single place to access wargame results; and (3) to learn about future wargames.²⁶ What is noteworthy is that an earlier review of US wargaming “revealed a lack of coordination and the absence of any direct link between the insights gained from wargaming and the department’s programmatic action.” Second, to revitalize US wargaming efforts a Defense Wargaming Alignment Group (DWAG) was formed. The DWAG – a rough equivalent to the Canadian Army Simulation Centre (CASC) – was responsible for taking inventory of wargaming capacity and capability department-wide, while concurrently aligning department leaders with departmental objectives.²⁷ The third and final step was to integrate allied capabilities towards developing cooperative concepts of operation.²⁸ The intent being that the involvement of US allies, such as Canada, would reveal the complexities and friction that would be faced in a high-end conflict. Simulated wargaming has proven effective in facilitating joint and combined training with US allies as captured in US Joint Staff’s coalition capability demonstration:

French Air Force Joint Terminal Attack Controllers at the Air Ground Operations School at Nancy-Ochey Airbase, France conducted virtual

²⁶ Cheryl Pellerin, Work: Wargaming Critical in Dynamic Security Environment, Department of Defense News, Defense Media Activity, 11 December 2015. Available at: <https://dod.defense.gov/News/Article/Article/633892/work-wargaming-critical-in-dynamic-security-environment/>

²⁷ *Ibid.*

²⁸ *Ibid.*

close air support missions with an AC-130 call for fire trainer at U.S. Special Operations Command's Joint Training Support Center at Hurlburt Field, Florida. Additionally, a Canadian infantry section at the Canadian Army Simulation Centre in Kingston, Ontario, conducted distributed virtual missions with U.S. and Canadian squads at Fort Bliss, Texas.²⁹

Cost Comparison and Analysis

Since 2016, the US has budgeted a \$10 million per year Wargaming Incentive Fund to reinvigorate U.S. analytical wargaming.³⁰ This funding aside, the cost of revitalizing an institutional wargaming capability varies dramatically in accordance with sophistication of systems. From the “low” end of the spectrum, tabletop exercises, seminars, workshops, and turn-based wargames are relatively inexpensive in nature. They are limited only by creativity – the base requirements include a developed scenario, the presence of a PTA Commander (s), an appropriate size OPFOR, and clear objectives to be achieved. This could be conducted adhoc over a map in the training area, or deliberately within an operational headquarters. On the “high” end of the cost spectrum however, is collective simulation based training (SBT). The cost of these SBT systems includes research and development, procurement, maintenance, contract logistics support and in some cases personnel.³¹ The preponderance of US analytical wargaming falls under this category.

²⁹ Kevin Seavey, Emilie A. Reitz, and Maj. Jillian Klug, “Establishing Multinational Live, Virtual and Constructive Interoperability through Mission Partner Environments”, Interservice/Industry Training, Simulation and Education Conference (I/ITSEC) 2016, p 5.

³⁰ Col. Garrett Heath and Dr. Oleg Svet, Better Wargaming Is Helping the US Military Navigate a Turbulent Era, Defense One, 19 August 2018. These WIF grants are distributed across DoD organizations based on applications for funds towards analytical wargames that simulated interactions with active adversaries. Available at: <https://www.defenseone.com/ideas/2018/08/better-wargaming-helping-us-military-navigate-turbulent-era/150653/>

³¹ Susan G. Straus et al, Collective Simulation Based Training in the U.S. Army – User Interface Fidelity, Costs, and Training Effectiveness, 2019 Rand Corporation, p 17. Available at: https://www.rand.org/pubs/research_reports/RR2250.html

SBT consists of two very different capabilities that equates to significantly different costs. The first is physical devices that simulate military equipment (PMSE) – such as a controlling station that replicates the inside of a US M1A2 Abrams Main Battle Tank. Primary US PSME trainers include the US Army’s Close Combat Tactical Trainer (CCTT) and the Aviation Combined Arms Tactical Trainer (AVCATT). The second type of SBT is virtual military equipment (VME) which uses game like simulations that soldiers can play. The US Army’s Games for Training program (GFT) utilizes Virtual Battlespace (VBS) – a government-off-the-shelf system based on the same off-the-shelf commercial game.³² The *Collective Simulation Based Training in the U.S. Army* captures the cost associated with these systems based on the average budgeted for fiscal years (FYs) 2016-2021.³³ The CCTT for example, carries a total cost of \$66.54 million per year (costs adjusted to FY 2017 (US) dollars). For US allies exploring cost effective SBT options, a “cost per soldier potential training day at current utilization” is more useful: (1) CCTT is \$750 per soldier per day; (2) AVCATT is \$7,000 per soldier per day; and (3) GFT is \$200 per soldier per day. While these marginal costs may seem high, it is “far lower than the alternative of live training.”³⁴ Ultimately, each system has different applications to various forms of training but the purpose of SBT wargaming is the same:

Players should be exposed to the chaos, pressures, and uncertainty encountered in real military competitions, or as closely as can be replicated. Most importantly, players should be able to observe and live with the consequences of their actions (where possible, based on previous rigorous analysis) in the face of a thinking and reacting competitor, and so

³² Susan G. Straus et al, *Collective Simulation Based Training in the U.S. Army – User Interface Fidelity, Costs, and Training Effectiveness*, 2019 Rand Corporation, p 17. Available at: https://www.rand.org/pubs/research_reports/RR2250.html

³³ *Ibid*, pp 17-18.

³⁴ *Ibid*, pp 17-18.

come to understand dynamic military competition from the perspective of opposing sides.³⁵

USTRANSCOM and Lessons Learned

In his testimony before the Senate Armed Services Committee on 10 April 2018, Gen. Darren W. McDew, United States Air Force Commander, USTRANSCOM spoke to the challenges facing his warfighting combatant command.³⁶ In response to the changing global security environment and in an effort to better understand contemporary threats, USTRANSCOM hosted a series of Contested Environment Wargames and Summits. Lessons learned from these events “drove changes in how (USTRANSCOM) plan for attrition, cyber, mobilization, authorities, access, and command and control.”³⁷ Lessons learned included: (1) the attrition of organic sealift and airlift fleets being incorporated in USTRANSCOM’s planning and requirements analysis; (2) planning for denied access to USTRANSCOM strategic nodes both domestically and internationally; and (3) USTRANSCOM’s susceptibility to cyber, resulting in the prioritization of readiness and modernization.³⁸ Without the aforementioned analytical wargame exercises, USTRANSCOM’s may not have self-identified these vulnerabilities that could have potentially been exploited by their adversaries.

³⁵ DEPSECDEF Bob Work and Gen. Paul Selva, Revitalizing Wargaming is Necessary to Be Prepared for Future Wars, December 8 2015. Available at: <https://warontherocks.com/2015/12/revitalizing-wargaming-is-necessary-to-be-prepared-for-future-wars/>

³⁶ Gen. Darren W. McDew, Statement Before the Senate Armed Services Committee On the State of the Command, 10 April 2018, p 3. Available at: https://www.armed-services.senate.gov/imo/media/doc/McDew_04-10-18.pdf

³⁷ Gen. Darren W. McDew, Statement Before the Senate Armed Services Committee On the State of the Command, 10 April 2018, pp 4-5. Available at: https://www.armed-services.senate.gov/imo/media/doc/McDew_04-10-18.pdf

³⁸ *Ibid*, pp 4-5.

CAF 'FORCE ON FORCE' TRAINING OPPORTUNITIES

The revitalization of the CAF's analytical wargaming capability is not simply a matter of adding "wargaming exercises" to any formation or unit training calendar. The critical ingredient, as espoused by Clausewitz and Jomini, and as practiced by the US DoD, is the inclusion of a dynamic and aggressive OPFOR "that challenges assumptions, realistically represents adversary actions, intentions, and capabilities, and is poised to ruthlessly pounce on any mistake or vulnerability."³⁹ At the same time, senior military commanders and defence leaders must accept, if not encourage, a 'train to failure' mentality. The infrastructure to conduct and support 'force on force' training is already established. CAF organizations such as CADTC, and its subordinate organizations CMTC and CASC, are well situated to fulfil such a mandate. Further analysis is needed to determine the feasibility of balancing training resources and exercises between certification/achieving BTS and 'force on force' focused training within the CA MRP and the CA Operations plan. The following recommendations are possible start states where 'force on force' training could be incorporated into live and simulated training in the near future.

Live Training

Land Operations 2021: The Force Employment Concept for Canada's Army of Tomorrow directs that future land forces will utilize dispersion and aggregation in order to gain an advantage over technologically enabled and adept adversaries.⁴⁰ CAF live training exercises must replicate, as closely as possible, how CAF land forces will

³⁹ DEPSECDEF Bob Work and Gen. Paul Selva, Revitalizing Wargaming is Necessary to Be Prepared for Future Wars, December 8 2015. Available at: <https://warontherocks.com/2015/12/revitalizing-wargaming-is-necessary-to-be-prepared-for-future-wars/>

⁴⁰ National Defence Canada, *Land Operations 2021: Adaptive Dispersed Operation*, Directorate of Land Concepts and Design, Kingston Ontario, 2007, p 11.

operate in the future battlespace. The CAF is currently deployed on several operations as part of the North Atlantic Treaty Organization's (NATO) response to Russian aggression. This includes 540 CAF members leading a NATO enhanced Forward Presence Battle Group in Latvia (Op Reassurance) and approximately 200 CAF members conducting security force training in Ukraine (Op Unifier). To be certified operationally ready for these missions, the majority of their joint collective training (level 5 (combat team) and above) is conducted at CMTC.⁴¹ Units from across the CAF are mobilized and prepared for these major exercises weeks in advance. An option is to simply create an adhoc operations box, task the PTA, assign an OPFOR, and impose limited constraints. While many military planners will argue that live 'force on force' training exercises should be done deliberately (to ensure logistics support, comms plan, safety plan, etc) this courtesy will not be extended by Russia prior to any offensive action; the Annexation of Crimea in 2014 did not come with any friendly warning. CAF units will have to fight in contested domains, with degraded communications, and an incomplete operating picture. The uncertain nature of an adhoc type live 'force on force' exercise helps replicate the 'friction' of war, provoking realistic frustrations – and ideally – sparks creative thinking towards finding a solution.

The CAF could take a page from the US Army for a second live 'force on force' training opportunity. The US Army fields a dedicated OPFOR cadre at the US National Training Centre (CMTC equivalent) in Fort Irwin.⁴² The 11th Armored Cavalry

⁴¹ Government of Canada, Land Operations – B-GL- 300-008, 2008, Ch 2 p 23. Available at: http://armyapp.forces.gc.ca/olc/Courseware/AJOSQ/JTRG/jtrg_01_02/references/JTRG_01.02_B-GL-300-008_E.pdf

⁴² Kyle Mizokami, "The "Russian" Combat Brigade the U.S. Army Keeps for Training, Mechanics", 29 June 2017. Available at: <https://www.popularmechanics.com/military/weapons/a27141/the-us-armys-russian-combat-brigade/>

Regiment, an active duty combat unit, has a ‘Russian’ OPFOR alter ego, the 60th Guards Motorized Rifle Division which is tasked to fight against American PTA during live ‘force on force’ training exercises. While the CAF may not have the budget to maintain a permanent OPFOR cadre, an option could be to create a 3 to 6 month rotating task for combat arms sub-units not in the RTHR year. This would serve three purposes. First, it would provide CMTC with a viable OPFOR that could enable the adhoc ‘force on force’ training previously mentioned. Second, it would establish CMTC as a viable destination for units looking to conduct deliberate level 3 (sub-unit) to level 5 (combat-team) live ‘force on force’ training during their RTHR. Third, it would professionally develop the tasked OPFOR and distribute ‘force on force’ training experience across junior leaders outside the RTHR window. This promulgation would have the dual benefit of educating future Commanders and reducing the stigma associated with a ‘training to failure’ philosophy.

Simulated Training

The CASC, like CMTC is an organization that falls under the CADTC formation. CASC is tasked with providing “synthetic environment capabilities in support of Land operations, training, and concept development” in support of the CA and other GoC departments.⁴³ As outlined in the CA Simulation Strategy, CASC is responsible for guiding CA simulated training capabilities to simulation centres across the CAF.⁴⁴ In a recent interview, Major General Simon Heatherington, Commander of CADTC stated that the CAF’s simulation and command and control systems need to replicate the equipment and tools currently being used on operations – or in other words – a SBT

⁴³ Government of Canada, The Canadian Army’s Simulation Strategy, dated 12 Nov 2012, p 1.

⁴⁴ *Ibid*, p 2.

PMSE capability.⁴⁵ In response to this need, the Directorate of Land Requirements is developing the CA's proposed Land Vehicle Combat Training System (LVCTS), comparable to the US CCTT, at an estimated cost of \$400 million (CAN). The CA Army goal is to have one site active by 2024 and a total of five sites in place by 2027.⁴⁶ DLR presents a similar cost analysis argument as the CCTT, in that it will save money over the long run:

Working with the assumption that half of all driver and gunnery training and on the order of 20 percent of all crew training will take place on simulators in future, the Army expects to save up to \$140 million in fuel and ammunition and in wear and tear on its vehicles over the 30-year life of the project.⁴⁷

The physical and functional fidelity of LVCTS, coupled with the benefits of conducting joint combined 'force on force' training, must be leveraged by Commanders to meet their future training needs.

The other SBT capability currently provided by the CASC similar to the US is VME. The CASC has a suite of software programs that includes Raytheon's Advanced Battlefield Computer System, the Joint Conflict and Tactical Simulation, and the same government-off-the-shelf VBS program as the US Army. CASC utilizes these systems to provide exercise design, development and delivery. Furthermore, for SBT under level 7, funding comes from Unit training budgets which provides Commanders with an integral level of flexibility to pursue 'force on force' training. The authority for higher level simulation training exercises, such as Ex Maple Resolve or Ex Unified Resolve, rests

⁴⁵ Canadian Army Today, Training in Transition, 9 April 2018. Available at: <https://canadianarmytoday.com/training-in-transition>

⁴⁶ Ian Coutts, Vehicle crew training: Welcome to a new (virtual) reality, Canadian Army Today, 5 September 2018. Available at: <https://canadianarmytoday.com/vehicle-crew-training-welcome-to-a-new-virtual-reality>

⁴⁷ *Ibid.*

with the CA.⁴⁸ This CASC framework is even better situated than live exercises to provide the psychological fidelity of ‘force on force’ training. SBT can easily incorporate an OPFOR with fewer constraints than live force training. This in turn would provoke the cognitive, behavioral, and affective responses relevant to fighting and countering a thinking and adaptive adversary. Lessons learned would not be “watered down”, and participants would be forced to reflect and think critically upon the decisions they made.

COUNTER-ARGUMENT

CMTC, and by default CASC, are both mandated by CADTC to provide collective training within a realistic and challenging full spectrum, contemporary operating environment.⁴⁹ This training is designed to enable learning and confirmation for designated HR forces. The CAF are not alone in adopting a scripted approach to training exercises – the US have often incorporated main event lists (MELs) due to time and fiscal constraints. This is the reality facing Western militaries who are managing progressively demanding operational tempos in an increasingly complex global security environment. In concert with SSE, the CA MRP and the CA Operations plan are sufficiently projecting, and meeting, force generation needs ahead of planned deployments in the service of Canada.

Canada’s operational track record questions the need to revitalize the CAF’s analytical wargaming capability. The quality and performance of CAF personnel while

⁴⁸ Canadian Army Today, Training in Transition, 9 April 2018. For Ex Unified Resolve 18, 1st Canadian Division remained in Kingston and integrated with other elements at their locations across Canada. Available at: <https://canadianarmytoday.com/training-in-transition>

⁴⁹ Government of Canada, CMTC website, p 2. Available at: <http://www.army-armee.forces.gc.ca/en/canadian-manoeuvre-training-centre/manoeuvre-training-index.page>

deployed on expeditionary operations has been proven many times over during the last 30 years. In 1992, Canada was the lead contributing nation for the United Nations (UN) Protection Force in Bosnia-Herzegovina (Op Harmony) and in 1995 deployed an additional 1,300 troops to the NATO Stabilization Force (Op Palladium) to the same theatre. The Canadian-led UN Assistance Mission for Rwanda (Op Lance) in 1994, the Disaster Assistance Response Team to Sri Lanka (Op Structure) in 2004, and Canada's deployment to Afghanistan (Op Archer) under the International Security Assistance Force from 2006 to 2011 are all examples of the CAF's capability to conduct military operations across the spectrum of conflict. The CAF has also proven flexible and adept at responding to municipal and provincial requests for assistance. CAF domestic operations include the Ice Storm of 1998 (Op Recuperation), G8 Security in 2002 (Op Grizzly) and support to Vancouver's 2010 Olympic and Paralympic Winter Games (Op Podium). At the time of writing, the CAF is deployed across Ontario, Quebec and New Brunswick in support of civil services battling record floods.

The quality of life (QoL) of CAF members must also be taken into consideration when recommending additional training exercises and restructuring. Members of the CAF are already separated from their families for extended periods of time on training events, career courses, and deployments. In fact, this stress on families and the importance of QoL has prompted the CAF to introduce a "Total Health and Wellness Strategy" that is also communicated within SSE.⁵⁰ Without question, the GoC and the CAF have a moral obligation to care for those who have accepted unlimited liability in the service of their country. An adoption of a 'force on force' training philosophy would

⁵⁰ Government of Canada, Department of National Defence, "Strong, Secure, and Engaged: Canada's Defence Policy", Copyright Her Majesty the Queen in Right of Canada, 2017, p 25.

inevitably place additional mental and physical demands on CAF members already struggling with their workloads. It would most likely be met with doubt, resentment and resistance.

Of course this is also the point of a ‘force on force’ training philosophy. It is intended to build physical endurance and to create mental resiliency. The old adage that “the more you sweat in peacetime, the less you bleed in war” is applicable.⁵¹ With regards to the GoC responsibilities for its people, the CAF serves as a unique instrument of Canadian foreign policy. Unlike diplomacy and foreign aid, military force deals in the currency of human lives. The future global security environment contains new challenges, and like the US Navy during the inter-war years, the CAF must train and be prepared for the next war. A commander’s first experience with failure should not be on the battlefield – CAF personnel must train in a ‘force on force’ context in order to ‘train to failure’.

While Canada’s operational successes speak for themselves, there have also been operational setbacks that suggest there is room for improvement. The 1993 Somalia affair is one example of where operational stressors proved too great for CAF members. What began as a humanitarian mission quickly unravelled and resulted in the torture and death of Somali Shidane Arone at the hands of Canadian soldiers, and the eventual disbanding of the Canadian Airborne Regiment.⁵² The mental stress of being deployed on operations is also felt well after soldiers come home. In a 2010 mental health study of CAF Veterans, 14 percent of serving members were assessed to have had one or more

⁵¹ This adage has been attributed to numerous military leaders, including Vijaya Lakshmi Pandit and US General Norman Schwarzkopf.

⁵² The Canadian Encyclopedia, Somalia Affair: Chronology. 17 March 2003. Available at: <https://www.thecanadianencyclopedia.ca/en/article/somalia-affair-chronology>

mental disorders, with depression being the most prevalent, followed by post traumatic stress disorder, generalized anxiety disorder, alcohol abuse or dependence, and panic disorder.⁵³ Even more concerning, is that the rate of suicide was proven statistically higher for serving military members and veterans compared to Canadian society.⁵⁴ While this paper does not present ‘force on force’ training and ‘train to failure’ as the solution to these systemic issues, building psychological resiliency during training could help mitigate and prevent future mental injuries.

CONCLUSION

Future CAF missions will be based on the actions of Canada’s adversaries, existing commitments to international organizations such as the UN and NATO, expectations of Canada’s allies, government decision-makers, and potential operating environments. Similar to other states, the CAF serves as the GoC’s critical instrument of Canadian foreign policy. Given the current global security environment, the CAF must develop agile forces that are ready to deploy across the spectrum of operations at short notice. These soldiers, sailors, airmen and airwomen must be combat effective, but also highly mobile, adaptive, networked, sustainable and capable of operating in a joint, interagency, multinational and public context.⁵⁵ For a small regular force military, this in turn places a premium on members who are creative, flexible, mentally resilient, and agile.

⁵³ James M. Thompson et al. “*Mental Health of Canadian Armed Forces Veterans: Review of Population Studies.*” *Journal of Military, Veteran and Family Health* 2016, p 74.

⁵⁴ James M. Thompson et al. “*Mental Health of Canadian Armed Forces Veterans: Review of Population Studies.*” *Journal of Military, Veteran and Family Health* 2016, p 74.

⁵⁵ National Defence Canada, *Land Operations 2021: Adaptive Dispersed Operation*, Directorate of Land Concepts and Design, Kingston Ontario, 2007.

The fundamental objective of the CAF's adaptive dispersed operations concept is to defend Canada at home and abroad – Canada's operational history over the past 30 years demonstrates the professionalism and effectiveness of the CAF in this endeavor. Yet for all of these operational successes, there are areas for concern. Western adversaries are waging a war "below the threshold" for a reason. Canada is vulnerable to this new irregular warfare which seeks to erode the West's will to fight. Clausewitz's analogy of a match between two wrestlers to compare two opponents locked in combat is worth revisiting. How can the CAF counteract Chinese, Russian or other state actors' technological capabilities which are contesting the status quo across every domain? What cyber, space and information technologies will the CAF be called on to defend against or defeat? How should Canada's doctrine and tactics, training and procedures adapt to this new security environment? The US Navy had similar questions and concerns during the interwar years of the 1920s and 1930s – analytical wargaming helped them navigate through this uncertain time. Almost a century later, the US DoD has revitalized their analytical wargaming capability – albeit with a more expensive price tag – to better prepare US forces for the future operating battlespace.

While current CAF training methodologies succeed in certifying the CA RTHR brigades, there remains a resistance and fear of 'training to failure'. There is still a place and need for scripted and controlled approaches to training events. Yet, there is a greater need to employ a dynamic and aggressive OPFOR – without it the CAF will struggle to produce the type of agile, creative, and flexible leaders needed for future operations. With small, incremental changes to the CAF training organizational framework and philosophy, live and simulated 'force on force' training opportunities are viable. Worth

over-stating, a vigorous ‘force on force’ training philosophy is the shield against ‘watered down” lessons learned, preferred outcomes, or self-fulfilling, self-congratulatory, and self-deluding prophecies. Without revitalizing the CAF’s wargaming capability or embracing a ‘training to failure’ philosophy, the first place a CAF Commander could potentially experience failure is on the battlefield. In this unforgiving environment, where the enemy is fighting to win, the price of failure will be Canada’s blood and treasure.⁵⁶

⁵⁶ Theodore Roosevelt, *The Strenuous Life*. 1900. Speech before the Hamilton Club, Chicago, April 10, 1899. Available at: <http://www.bartleby.com/58/1.html> Blood and treasure refers to the “lives and money”, generally used in reference to the high price of war or conquest.

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