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Launching Canada's Artillery Capabilities Into the Future

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Exercise Solo Flight

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LAUNCHING CANADA'S ARTILLERY CAPABILITIES INTO THE FUTURE

"If you don't have enough artillery, quit."

— General Richard Cavazos

INTRODUCTION

From its humble beginnings as A and B Batteries established in 1871 by General Order No. 24, the Royal Canadian Artillery (RCA) has delivered devastating effects in every major conflict in which Canada was involved.[1] Throughout its history the Canadian artillery has constantly evolved to meet the challenges of modern warfare, from the development of the creeping barrage during World War 1 to the deployment of Unmanned Ariel Vehicles (UAVs) in Afghanistan.[2] The structure of the RCA has also remained relatively unchanged since its inception, but its capabilities and tactics have dramatically evolved to reflect changing technology and modern threats.

Historically the RCA's capabilities have been structured around tube artillery (howitzers and mortars) either towed or self-propelled in regiments and batteries. Typically, one regiment per brigade with three batteries per regiment. As technology was developed the number of guns or firing units needed to achieve effects on the battlefield was decreased. Capabilities such as extended range and precision ammunition, with long range rockets and missiles have greatly increased the battlefield effects utilizing fewer resources then traditional ammunition.

Over the last 20 years we have seen the changing face of warfare develop at an extremely fast pace. State on State conflicts are still a reality, however smaller non state adversaries such as criminal or terrorist organizations have increasingly become more prevalent.[3] As emerging technologies continue to be developed at a breathtaking pace, and with chronic budgetary constraints, procurement issues and personnel shortages, what does the artillery of the future look like and what capabilities should be delivered. This paper will assert that to remain relevant in the future, in the face of personnel shortfalls and aging equipment, the RCA should reorganize its current structure to reflect task tailored subunits based on capabilities to achieve a more agile force capable of delivering multiple effects.

REGULAR AND RESERVE FORCE STRUCTURE

Canadian Artillery has historically for the most part been structured along the same lines as its British counterparts and remains the same today. The RCA currently has four regular force Regiments across three Canadian Mechanized Brigade Groups (CMBGs) and nineteen reserve Regiments across six reserve Canadian Brigade Groups (CBGs).[4] The regular force regiments consist of three close support regiments and one general support regiment. The close support (CS) Regiments (1 RCHA,

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[1] "The Founding of A & B Batteries - the Royal Canadian Artillery Museum." 2021. The Royal Canadian *Artillery Museum - Canada's National Artillery Museum*. June 30. https://en.rcamuseum.com/the-founding-of-a-b-batteries/.

[2] "The Great War - Battle of Vimy Ridge." 2018. *The Great War - Battle of Vimy Ridge - Canada's History*. October 2. https://www.canadashistory.ca/explore/military-war/the-great-war-battle-of-vimy-ridge.

[3] Binder, Markus, and Gary Ackerman. 2014. "Anatomizing Chemical and Biological Non-State Adversaries." *The National Consortium for the Study of Terrorism and Responses to Terrorism*. https://www.start.umd.edu/pubs/STARTResearchBrief_Anatomizing.pdf.

[4] "Regiments & Independent Batteries." 2023. *The Royal Regiment of Canadian Artillery*. May 30. https://rca-arc.org/the-serving-regiment/regiments-independent-batteries/.

2RCHA and 5 RALC) are based on tube artillery (M777 155mm towed howitzers). They consist of two, gun batteries an Observation battery, a Surveillance and Target Acquisition (STA) battery, and one headquartered battery. 4 GS Regiment provides the RCA's Air Defence capability with medium range radars (MRR) and a STA capability with the CU172 Blackjack SUAV.[5] The reserve regiments are all based on tube artillery (C3 105mm towed howitzers) with little other capabilities and are considered force generators. The reserve regiments usually consist of a headquartered battery and one or more, gun batteries.

The RCA's current structure is well suited to respond to conventional threats with its regular force units augmented by its reserve force. However, this augmentation generally only applies to the gun batteries with limited augmentation above the rank of Master Corporal. There is extremely limited capacity within the reserves to support the Observation or STA batteries. This is mainly due to the delta in training between the regular force and reserves and the platforms which are used to train. In the reserve force Forward Observation Officers (FOOs) and their parties are not trained in most of the specialty missions and specialized munitions that are used in operations, making it difficult to augment the regular force observation batteries without substantial training. The same can be said for the STA battery as there is little to no capability at the reserve level to support. The artillery trade is divided into three streams of STA. Air Defence, and Field, with the reserve force being predominately the field trade leading to the issue of only being able to augment one third of the Artillery Corps current capability.[6] With current staffing shortfalls and considering that "combined, the three regular force field regiments possess the same number of gun detachments as did 1 RCHA in the Germany era,"[7] it raises the question is our current structure within the artillery sustainable?

A more effective structure would be to align the reserve force regiments along the three streams in each brigade and therefore increasing the ability to augment their regular force counterparts. However, to do this a substantial investment in resources and an overhaul of reserve training policy would have to occur. Secondly equipment and weapons systems would have to be common throughout the Royal Regiment. This would allow for a smoother transition when augmenting for operations and decrease training deltas across the artillery and not just the gun batteries. By moving Primary Reserve regiments into the three training streams, we would maintain symmetry, while building greater capacity. The Primary Reserves mission is "to provide the CAF with professional personnel at directed levels of readiness who will contribute to the capability of the CAF"[8] If this continues to be the case then "directed levels of readiness"[9] need to change to maintain the Artillery's capabilities into the future.

The structure of the Artillery Regular Force units should also undergo a realignment to increase flexibility and capability. In 2010 during the War in Afghanistan the regular force units underwent a restructuring introducing the observation batteries.[10] This restructuring reduced the strength of the gun

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[5] "Government of Canada." 2022. *Canada.Ca*. / Gouvernement du Canada. January 26. https://www.canada.ca/en/army/corporate/5-canadian-division/4-artillery-regiment.html.

[6] Wing, O.M., and N.E. Kaempffer. 2024. "Strengthening the Primary Reserves – the Royal Canadian ..." *Mulitibriefs.Com*. RCAA. Accessed May 2. https://www.multibriefs.com/briefs/rcaa/Strengthening%20The%20Reserves.pdf.

[7] "The Royal Regiment of Canadian Artillery Strategic Capabilities Assessment." 2016. *RCA-ARC.Org*. http://rca-arc.org/wp-content/uploads/2018/10/RCA-Strategic-Capabilities-Assessment-26-Apr-16-EN.pdf

[8] "Government of Canada." 2017. *Canada.Ca*. / Gouvernement du Canada. April 19. https://www.canada.ca/en/department-national-defence/corporate/policies-standards/defence-administrative-orders-directives/2000-series/2020/2020-1-primary-reserve.html

[9] Ibid.

[10] Selbie, Jim. 2020. "The War in Afghanistan 2002-14." *RCA*. January 21. https://rca-arc.org/part0240-the-war-in-

batteries by pulling out the FOO and JTAC parties and amalgamating them all under one battery. This also created the need for another sub-unit HQ further increasing the number of personnel needed in the regiment. As current Defence Minister Bill Blair puts it "the death spiral" or the current shortage of personnel CAF wide despite recruiting initiatives, is also being felt by the Artillery Corps.[11] This national shortage has necessitated a greater reliance on reserve augmentation to meet operational commitments and thereby further exasperating the shortage at the reserve level. To alleviate some stress the regular force could absorb the observation battery back into the gun batteries where they originally came from. This would also allow room for another battery with new capabilities in the future should personnel become available.

Another factor that has added to the gun batteries being shorthanded is Canada's choice of platform for the artillery, the M777 155mm Lightweight Towed Howitzer. The M777 requires a crew of 10 soldiers to fire as compared to previous platforms like the Giat 105mm Towed LG1 which only needed a 5-person detachment or 4 persons for the M109 155mm self-propelled Howitzer. The current PY's for a standard gun battery is only 116, considering the number of soldiers required to sustain and fire the battery and considering the Recce party, the Command Post party and battery leadership, this leaves few soldiers to employ 10-person gun detachments.[12]

With the current personnel shortage and limited budgets, it is hard to restructure an already skeleton force. The Close Support Regiments are already deploying with 20% reserve augmentation and further augmentation from other units to field a single battery to an operational theatre. At the 2024 Artillery Advisory Board the Director of Artillery's bottom line up front to Commander Canadian Army was "the RCA is pushed to its max capacity in order to support mandated tasks, as SIP shortfalls impact the Corps, ruthless management of resources will be required."[13]

CAPABILITIES THAT SUPPORT RESTRUCTURE AND FUTURE OPERATIONS

The current structure of the Artillery Corps is rigid with regiments being configured in the same way across the corps. Although this builds redundancy to maintain current capabilities supporting the CMBGs, it leaves little room for new capabilities. To better provide fire support and increase new capabilities one regiment could be redesignated with a new capability. As modern conflict over the last twenty years has demonstrated (Afghanistan) we only deploy at the battery level and therefore one artillery troop from each regiment could form a composite battery for operational deployments. This approach would allow regiments to support other tasks as well because they are not losing 30 to 50 % of their soldiers to a single deployment. Of course, to accomplish this, changes in the Army's readiness plan would have to change and a significant investment in new technology and weapons systems would be vital, allowing for more flexibility with reduced number of soldiers. The Indirect Fire Modernization (IFM) project at the Directorate of Land Requirements is currently looking at new capabilities such as a Self-Propelled Automatic Loading Howitzers (SP) which is considered an urgent operational requirement.[14] Although the project is unfunded its concepts are in line with the current needs of the

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afghanistan-2002-14/.

[11] D'Andrea, Aaron. 2024. "Canada's Military Facing 'death Spiral' on Recruitment, Minister Says - National." *Global News*. Global News. March 8. https://globalnews.ca/news/10341588/canadian-forces-recruitment-death-spiral/.

[12] Chiu, Mathew. 2023. "Rethinking the Organisational Structure of the Royal Regiment ..." *Canadian Forces College*. https://www.cfc.forces.gc.ca/259/290/49/192/Chiu.pdf.

[13] Bouckaert, K.L.A. 2024. "Royal Canadian Artillery Advisory Board." In, 1–3. Ottawa Ontario Canada: RCA.

[14] Coutts, Ian. 2020. "Rethinking the Future of Indirect Fire." *Canadian Army Today*. September 23.

artillery. The acquisition of this type of platform would reduce the requirement of 10-person gun detachments to 5.[15] This would, in essence double our fire power without increasing PYs. Such a system could be deployed with less equipment, and less personnel, allowing the artillery to increase capability with fewer resources. An SP platform would also be a good fit for the reserve force also allowing it to increase its capability to augment with little training.

Another capability that Canada is lacking is Long Range Precision Fires (LRPF) such as a High mobility Artillery rocket System (HIMARS) platform with extended range munitions. As this type of system is a Division level asset one of the CS Regiments could be redesignated to a Missile Regiment. The firepower of the Royal Regiment would be substantially increased covering both the close battle with SP artillery and the deep fight with HIMARS with little increase to personnel numbers. The IMF program has also identified this need; however, it would not be a reality until 2035 or beyond if funded.[16]

Growing threats posed by emerging technologies such a drones and artificial intelligence demand that Air Defence (AD) capabilities keep pace with technological advances. To address these threats, Counter Uncrewed Aerial Systems (CUAS) and Ground Based Air Defence systems (GBAD) are being considered to strengthen our AD capability.[17] These would reside within 4 GS Regiment. The structure of 4 GS is a mix of regular and reserve force soldiers each with varying level of AD expertise. Unfortunately, they are under equipped with only a medium range radar and CU172 Blackjack UAV to carry out the AD task. Having divested its last GBAD system 20 years ago under a previous governments decision, this renewed interest to reinvigorate the AD capability is timely as air defence threats are becoming increasing more prevalent in modern conflicts.[18] These new systems are slated to for final delivery sometime in late 2026 to 2030.[19] Currently the only restructuring needed is the establishment of reserve AD Regiment to augment 4 GS and a realignment of 4 GS Batteries to accommodate their near future capabilities. A redesignation of a reserve regiment to Air Defence specializing in GBAD would be an asset to provide some depth to the AD capacity and provide augmentation to a highly specialized trade.

ARTILLERY REALIGNMENT WITHIN THE BRIGADES

If the Royal Regiment were to receive the needed injection of new capabilities that the IFM proposes followed by proper funding and assuming personnel levels remain the same, a realignment of the regiments would have to be implemented to achieve maximum efficiencies. It would make sense for 1 RCHA in 1 CMBG to become a rocket regiment given its proximity to ranges large enough to accommodate the HIMARS system. The regiments two gun batteries and observation battery would reroll to rocket batteries while maintaining the STA battery. As HIMARS is a Div asset 1 RCHA would be directly responsive to 3 Canadian Div but reside in 1 CMBG in the same way that 4 GS is situated in 5 Div. In 2 CMBG, 2 RCHA could retain one battery of 6 x M777's to have a light gun capability. Its

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https://canadianarmytoday.com/rethinking-the-future-of-indirect-fire/.

[15] Bouckaert, K.L.A. 2024. "Royal Canadian Artillery Advisory Board." In , 1–3. Ottawa Ontario Canada: RCA. f

[16] Ibid

[17] "National Defence." 2024. *Canada.Ca*. / Gouvernement du Canada. April 24. https://www.canada.ca/en/department-national-defence/programs/defence-ideas/element/sandboxes/challenge/counter-uncrewed-aerial-systems-concept-development.html.

[18] Pugliese, David. 2022. "Ground Based Air Defence: Back on the Agenda for Canadian Army." *Espritdecorps*. espritdecorps. December 5. https://www.espritdecorps.ca/feature/ground-based-air-defence-back-on-the-agenda-for-canadian-army.

second gun battery and observation battery would reroll to SP heavy batteries with 6 x SP guns each and maintain the STA capability in the fourth battery. 5 CMBG's 5 RALC would realign and mirror 2 RCHA. 4 AD Regiment would only implement new capabilities into its current structure.

For the Primary Reserve we would ideally see one artillery unit from 38, 39, and 41 CBG form an artillery tactical group (ATG) with one regiment from each CBG reroll to rocket regiments to add depth and support augmentation to 1 RCHA. The remaining regiments in 3 Div would assume either a light or heavy SP capability. In 4 Div we have 6 regiments across 31, 32 and 33 CBG. Since 33 CBG is centered around CDSB Petawawa and the training area could accommodate SP artillery, its three artillery units would reroll to heavy SP regiments, 32 CBG has two artillery regiments, one of which could assume the STA task while the other the M777 task. 31 CBG only has one artillery regiment, and they would have the M777 task to maintain firepower within the CBG. In 2 Canadian Division there are 3 artillery regiments across two CBGs. As 5 RALC will have the same tasks as 2 RCHA there reserve units should also mirror their regular force counterparts. 35 CBG has two artillery units, one of which would assume the heavy SP task and the other the STA task. 34 CBG only has one firing unit so they could assume the M777 task. Residing in the 5th Div there one artillery unit in each of its two CBG's. Both these units would retain their firepower capability with one assuming the M777 roll while the other takes the Heavy SP roll.

This realignment would support Canada's firepower and air defence requirements while not increasing the need for personnel. The RCA's Strategic capabilities Assessment has pointed out that, "The small establishments and manning of regular regiments presents a high risk to sustained operations … it is also imperative that the capability of the reserve force to provide well-trained soldiers and detachments be maintained."[20] Last year the regular force artillery Strategic Intake Plan (SIP) called for 332 new soldiers, the intake however only produced 48 soldiers with attrition reaching 83 soldiers.[21] The production of Gunners since 2020 has been in decline and projected attrition will increase over the next 5 years. With a looming personnel crises and aging equipment and capabilities the regular force artillery must diversify its arsenal to support increased capability and interoperability to meet our future challenges. Redundancy of these capabilities should reside within the reserve regiments which in the and long run will promote quicker and more cost-effective augmentation by eliminating delta training requirements and provide sustainment of capability in the event of equipment shortfalls.

CONCLUSION

The title of George Blackburns's third book "Where the Hell Are the Guns?"[22] could be a familiar battle cry for today's Royal Regiment of Canadian Artillery. With the M777 at the end of its lifespan, the C3 howitzers on life support, little AD capacity and increasing personnel shortages, Canadian artillery is at a crossroads regarding its future. Maintaining the status quo with respect to indirect fire capabilities and its structure between the regular and reserve force could lead to a loss of capability if we are unable to sufficiently maintain staffing levels and equipment states across the corps. The other option is to aggressively restructure using technologically advance platforms and bridging the gap between regular and reserve capabilities to produce a more agile force with a diverse arsenal while

[20] "The Royal Regiment of Canadian Artillery Strategic Capabilities Assessment." 2016. *RCA-ARC.Org*. http://rca-arc.org/wp-content/uploads/2018/10/RCA-Strategic-Capabilities-Assessment-26-Apr-16-EN.pdf.

[21] Bouckaert, K.L.A. 2024. "Royal Canadian Artillery Advisory Board." In , 1–3. Ottawa Ontario Canada: RCA.

[22] Blackburn, George G. *Where the hell are the guns?: A soldier's eye view of the anxious years, 1939-44*. Toronto: CNIB, 2001.

reducing current staffing deltas. While the IFM program provides a good roadmap to future success, it has yet to be funded and the need maintain our capacity remains funded through Urgent Operational Requirements (UOR).[23] Although procuring capabilities this way greatly compresses procurement timelines it is only a band aid solution and does not guarantee any long-term results.

The proposed restructure does not take into account any funding models, but it would more closely align with our allied counterparts such as the United States who's regular and reserve units have symmetry allowing for greater integration between the two components. The new structure would also provide greater coverage throughout the fire support spectrum from close support to the deep battle, while offering a larger air defence umbrella. As the conflict in the Ukraine has taught us, conventional warfare is still a reality, therefore any new structure should have the flexibility to respond in both a conventional and hybrid setting. The introduction of HIMARS and SP artillery provide that flexibility. Investment in newer advanced platforms across the artillery and task tailored batteries and regiments means a net reduction of required personnel, leaving room to increase the number of platforms or the addition of other fire support capabilities. With proper investment and realignment, the RCA will continue to deliver relevant capabilities with greater lethality encompassing a total force concept throughout the corps.

[23] Bouckaert, K.L.A. 2024. "Royal Canadian Artillery Advisory Board." In , 1–3. Ottawa Ontario Canada: RCA.

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