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THE CANADIAN ARMED FORCES' ANTI-ARMOUR CAPABILITY GAP: THE WAY AHEAD

Maj L.L.F. Harvey

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Maj L.L.F. Harvey

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THE CANADIAN ARMED FORCES' ANTI-ARMOUR CAPABILITY GAP: THE WAY AHEAD

AIM

1. The Canadian Armed Forces (CAF) currently has a gap in its medium and long range anti-armour capabilities. This service paper proposes an analysis of this capacity gap as well as potential options to resolve this issue.

INTRODUCTION

2. Background: Up until Canadian participation in the conflict in Afghanistan, the anti-armour battle has been the subject of many discussions throughout the Army. Despite the fact that this last conflict has generated misconceptions about armoured warfare becoming a dated topic, armoured vehicles remain today and will remain for the foreseeable future a major threat to any operation. The most recent examples of conflicts such as the war in Ukraine and the rise of ISIS have shown that potential belligerents frequently have tanks and other armoured vehicles.¹ With the recent election of a Liberal government prone on returning to peacekeeping operations, there is no doubt that anti-armour weapons will be required. Especially so, if Canada sees itself once more involved in higher intensity combat environments such the ones faced in peace-enforcement missions. Although battles involving massed armour seem to be a thing of the past, there still remains the distinct possibility that dispersed and isolated units or sub-units will be required to deal with the same numbers of armoured vehicles as they would in a high intensity conflict.² Asymmetric warfare poses new challenges as this threat has proven to be significantly more difficult to define and identify. Thus, the weapons used by our forces must be tailored to

¹ Department of National Defence, *Anti Armoured Master Plan*, (Ottawa: Directorate of Land Requirements, 2002), 1/8.

² *Ibid.*

this new environment if the CAF are to remain a credible and capable partner in a multinational coalition.

3. Thesis: It is hereby argued that CAF currently have a capacity gap in anti-armour capabilities and that, failing to equip our forces with the required lethality and precision to kill tanks while minimizing the danger of collateral damage, they might become irrelevant in emergent operational environments. As such, deployed forces must be able to defend themselves against attacks that may be delivered in almost any form, including modern tanks.

4. Methodology: This paper is divided in three parts. The first part offers a discussion on the facts pertaining to the issue at hand. It presents possible CAF employment scenarios, the doctrinal tenets of close anti-armour battle, the state of the current CAF anti-armour arsenal as well as employment and manning considerations for anti-armour weapons as they pertain to CAF operations. The second part of this paper presents the main conclusions and options that could be derived from the aforementioned discussions. Finally, the last section offers recommendations as to what the CAF should to address its current anti-armour shortfalls.

DISCUSSION

5. Possible employment scenarios: There are five potential scenarios in which the CAF might find itself engaged in the horizon 1-2 timeframes. They are as follows:

- a. International Humanitarian Assistance: In this scenario, the deployed forces would be required to provide security for airports, ports, supply routes, warehouses, and distribution points. The threat may include non-state forces and/or elements of a defeated or disorganized regular army. The key infrastructure

under CAF's protection could be likely targets for potential adversaries that may possess armoured vehicles.³

- b. Protection and Evacuation of Canadians Overseas: In this scenario, the deployed force would probably be required to secure a port or airport, provide temporary security for Canadian diplomatic or other civilians, and provide secure transport for evacuees. Although potential threats would not be directed specifically towards the CAF, it is likely that the key facilities under its custody would be targeted by belligerents using armoured vehicles. The credible threat or use of anti-armour weapons could be required to maintain security until the evacuation is complete.⁴
- c. Peace Support Operations (Chapter 6): This scenario is typical of many of the peacekeeping missions in which CAF have participated. Belligerents may include both regular and irregular forces. Although a ceasefire may be in effect, the underlying causes of the conflict may still remain. If a peacekeeping force is to be successful, it must demonstrate both the resolve and ability to enforce the terms of the ceasefire, particularly if threatened by local "warlords". These threats will almost always include armoured vehicles and the possession of effective anti-armour weapons would give the peacekeeping force the ability to remain credible by having the capacity to engage targets at all ranges.⁵

³ Department of National Defence, *Option Analysis – Advanced Lightweight Anti-armour Weapon System*, (Ottawa: Senior Review Board, 2002), 2.

⁴ Department of National Defence, *Statement of Operational Requirement - Advanced Lightweight Anti-armour Weapon System*, (Ottawa: Chief of Land Staff, 2003), 6.

⁵ Department of National Defence, *Anti Armoured Master Plan . . .*, 3/8.

- d. Peace Support Operations (Chapter 7): This scenario would most likely involve conventional low to medium intensity warfare involving regular or asymmetric forces. Armoured vehicles would probably be used sporadically and under special conditions of cover (bad weather, dug in, urban, etc.) to threaten coalition forces. An anti-armour capability would be an essential element providing security and freedom of manoeuvre to CAF elements. Any Canadian Army (CA) element committed without a full complement of anti-armour weapons would be severely limited in effectiveness, and at risk of becoming a liability rather than an asset to the coalition commander.⁶
- e. NATO Collective Defence: Operations conducted in accordance with this scenario would cover the whole spectrum of intensity of conflicts. Adversaries would be regular armies with state of the art equipment. They would include large numbers of armoured vehicles, including modern main battle tanks. Environmental conditions could include almost all types of terrain and weather found in Europe and Western Asia. A complete anti-armour capability, at all ranges, both mounted and dismounted, would be absolutely essential if CAF were to meet its engagements towards NATO and if it were to be a useful ally in the accomplishment its aim.⁷
6. Doctrinal delineation of anti-armour combat: Operations against enemy armoured assets will commence as soon they are identified and as deep into enemy territory as they can be reached. This anti-armour deep battle will be a joint operation making the best use of the variety

⁶ *Ibid.*, 4/8.

⁷ Department of National Defence, *Option Analysis* . . . , 4.

of army, navy and air force and coalition assets. This joint operation will primarily see engagements using aircraft, both rotary and fixed wing, and very long range naval and ground force indirect fire assets directed against the larger concentrations of armoured forces inside large fireboxes. As these forces are being brought closer to friendly forces they will start to be engaged in close battle by all anti-armour systems of the ground forces. At this stage, the anti-armour systems form a continuous zone of engagement comprised of overlapping layers.⁸ The CAF and its NATO allies divide the anti-armour close combat zone into three overlapping engagement bands (Fig 1):

- a. Short Range (0-600m): This is the band in which anti-armour effects are attained by Short Range Anti-armour Weapons (SRAAW).
- b. Medium Range (500-2000m): Weapons used within this engagement bands are termed Medium Range Anti-armour Weapons (MRAAW).
- c. Long Range (1500-5000m): In this engagement band, effects are attained by Long Range Anti-armoured Weapons (LRAAW).⁹

⁸ Department of National Defence, *Anti Armoured Master Plan . . .*, 1/8.

⁹ Department of National Defence, *Synopsis Sheet – Anti-armour Weapon Systems - Omnibus*, (Ottawa: Directorate of Land Requirements, 2000), 1/6.

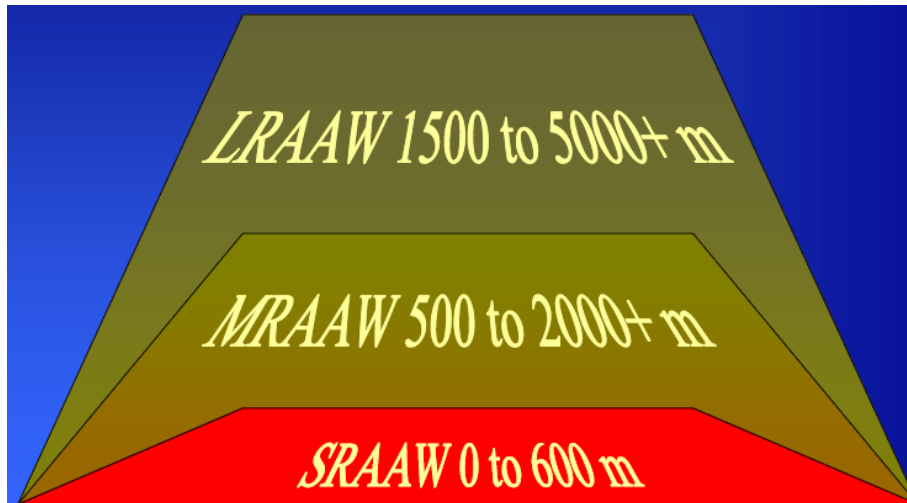


Figure 1 – CAF and NATO anti-armour close combat engagement bands
 Source: Canadian Army, Synopsis Sheet – Project 0002507 anti-armour weapon system omnibus, 1/6.

7. CAF's current weapon capabilities:

a. Non-infantry anti-armour weapons: The following non-infantry weapons could be fielded to defeat armoured vehicles in the MRAAW and LRAAW engagement bands:

- (1) F-18 Fighter Ground Attack: There are limited numbers of F-18s in the CA inventory. The primary role for the F-18s is anti-air but they do have a ground attack capability. They can be equipped with Paveway kits for laser guided bombs and other advanced precision guided munitions (PGM) which enhance the anti-armour capability of this system. Fast air operations are good for deep anti-armour operations but questionable for close anti-armour combat operations without FOO/FAC presence.¹⁰

¹⁰ Department of National Defence, *Anti Armoured Master Plan . . .*, Anx A, 13/34.

(2) 155mm SP Howitzer (M777). At the moment our M777s fire mainly HE rounds in suppression or neutralization roles but current ammunition natures include DPICM rounds which disperse a 60mm AP sub-munition capable of penetrating the top of most fighting vehicles. It is not clear for this author whether the CAF currently holds such ammunition in its inventories. The M777s also can fire PGM rounds which the CAF holds in limited numbers.¹¹ These rounds are effective against immobile armoured vehicles but their usefulness would be severely decreased for engagements against moving targets.

(3) Leopard 2 A4/A6: The Leo 2 has a 120mm main gun that can penetrate the armour of the most modern main battle tanks (MBT). Its range permits it to be effective in the LRAAW engagement band. The CAF currently holds three squadrons of such tanks (fielded with 1 Canadian Mechanized Brigade Group - CMBG) with a fourth being used for training purposes at the Armoured School in Gagetown. It must be mentioned that 2 and 5 CMBGs currently don't have tanks at all.

b. Infantry anti-armour weapons: The following weapons systems are actually fielded by infantry units. These weapons span all three anti-armour engagement bands:

(1) LAV-III with 25mm cannon (MRAAW): This cannon is mounted on the LAV-III and the Coyote surveillance vehicle. It has an effective range of

¹¹ *Ibid.*, 15/34.

2400m. The most recent threat assessment concluded that the cannon's lethality would be sufficient to defeat most enemy Infantry Fighting Vehicles (IFV) until the wider proliferation of newer generation IFV (such as the BMP-3) will render the caliber obsolete.¹² LAV-III does not have the firepower to kill an MBT and is therefore not an effective anti-armour system.

- (2) TOW Long Range Anti-Armour Weapon (LRAAW): The TOW system has been in CA service since 1975. Since then, it has been upgraded several times including the addition of a turreted version LAV III chassis.¹³ Unfortunately, the LAV III platform was abandoned and phased out shortly after 2005. The CAF currently fields antiquated dismounted systems on tripods. The TOW ammunition holdings are a legacy from pre-2005 as no new procurements were made. The advanced training necessary to effectively engage targets with this weapon has also not been maintained and very few personnel are current with its use.
- (3) Carl Gustav 84mm (SRAAW). The Carl Gustav is the second most capable crew-served anti-armour weapon in Canada. With about 1100 weapons in service throughout the Regular Forces and the Reserves, it is the anti-armour weapon with the widest distribution. Armed with its current Type-551 projectiles, it has a theoretical range of 700m against stationary targets and 500m against moving ones. The 551 round would be

¹² Department of National Defence, *Anti Armoured Master Plan . . .*, Anx A, 20/34.

¹³ *Ibid.*, 21/34.

effective against older generation MBTs but is unable to penetrate tanks equipped with modern reactive armour. Each infantry company is currently equipped with four such weapons.¹⁴

- (4) M-72 Short Range Anti-armour Weapon (SRAAW). The M-72 is used by all soldiers of the CA but mainly by soldiers in the arms and services that are not equipped with the Carl Gustav weapon.¹⁵ Its 66mm round is marginally effective against IFVs and of very limited use against MBTs.

8. Manning considerations: Over the last decades the authorized manning of infantry battalions has been reduced considerably. From an establishment of four line companies plus a combat support company comprising reconnaissance, anti-armour, pioneer, mortar and signal platoons, the battalions' strength has been withered down to only three line companies plus a reconnaissance and a signal platoon. Since the original allotment of Personnel/Year (PY) has been reinvested in other CAF capacities, it is unlikely that the infantry battalions will see an increase in their current PY establishment anytime soon. Also of note is that two out of three CMBGs armoured regiments are entirely equipped with Coyote reconnaissance vehicles. On top of having a marginally effective gun, this situation creates an unnecessary redundancy of reconnaissance assets within those formations.

CONCLUSIONS

9. As can be seen from the facts presented above, CAF currently do not have dedicated anti-armour capabilities capable of effectively defeating MBTs in the MRAAW and LRAAW engagement bands. Platforms such as the CAF-18 and M-777 howitzers are best used during the

¹⁴ Department of National Defence, *Anti Armoured Master Plan . . .*, Anx A, 24-25/34

¹⁵ *Ibid.*, 26/34.

deep anti-armour battle. Relying on these weapons for engagements in the LRAAW and MRAAW bands could be problematic since there is a high probability that they would be committed to other tasks during the anti-armour close battle. While the Leopard 2s represent superb tank killers in their own right, armoured units are to be used first and foremost as manoeuvre elements. As a result, tanks might be unable to effectively participate in support of the close anti-armour fight if they are to be otherwise committed to their primary tasks of maneuvering. In other words, it would be impossible for tanks employed in fixing enemy armour in a kill zone to, at the same time, manoeuvre for a counter-attack. The same quandary applies to the use of LAV III for anti-armour warfare. The TOW is a very effective weapon, but its platform is not currently mobile and its wire guide technology is jaded. The sorry state of ammunition inventory and personnel training makes TOW more akin to an endangered species. In light of the discussions above, we can thus conclude that, in order for the CAF to fill its anti-armour capacity gap, the following are needed:

- a. A dedicated MRAAW that would be integral to infantry companies and whose use would not necessitate the creation of support elements that would further dilute battalions' manoeuvre capabilities. This requirement is PY-neutral.
- b. A dedicated LRAAW that would be mounted on existing armoured regiments' platforms and whose firing system could be operated from the vehicles. This would allow armoured regiments' redundant reconnaissance capacities to be transformed into a more potent striking power. This would give these assets' integration into battle groups a greater added-value. This requirement is PY-neutral.

10. Options analysis: To resolve this issue, the CAF has three courses available:
- a. Option 1 - Maintain the status quo: This option entails relying on the already existing non-infantry weapons to plug the gap within the MRAAW and LRAAW engagement bands. This option would see the acquisition of more artillery PGMs as well as potentially acquiring improved or additional fixed wing or rotary aviation assets for an anti-armour role. The advantages of this option are that these platforms are already fielded and can easily be complemented by assets from our allies. The disadvantages of this option are as follows: increased reliance on allies adds the risk that we may not be their priority and the systems may not be available when we need them the most; artillery systems may be employed elsewhere in their primary role and may not be available at a critical time; air assets are limited by weather conditions and may not be available all of the time and the systems are dependent on good communications and may not be available in a depleted communications environment.¹⁶
 - b. Option 2 - Develop new anti-armour systems: From an operational perspective, this might be the best option as it would allow the CAF to develop and field a task-tailored suite of weapons using the scale of technology it really needs. On the other hand, this option is the most costly as the cost of developing such systems from scratch would run in the hundreds of millions. This is currently beyond the CAF's means. Furthermore, this option entails the longest timeframes for

¹⁶ Department of National Defence, *Anti Armoured Master Plan . . .*, Anx D, 1/1.

completion and the CAF might not have the time to fully implement these new weapons before the situation calls for them.¹⁷

- c. Option 3 - Acquire new anti-armour systems: This option would see the purchase of weapons that could be fielded in accordance with the requirements highlighted at para 9 a-b. This option offers the best anti-armour coverage at all engagement bands. It also ensures units will be equipped to maximize their combined arms effectiveness while minimizing their loss of maneuverability. The cost of this option would be high as it would necessitate larger 'up-front' expenses. The total cost, however, may prove to be the most cost effective over the life cycle of the systems.¹⁸ This is also the quickest option as it draws on already existing fielded and battle-tested technologies.

RECOMMENDATION

11. Based on the above analysis, option 3 is recommended as the best course of action.

¹⁷ Department of National Defence, *Option Analysis* . . . , 14-15.

¹⁸ Department of National Defence, *Anti Armoured Master Plan* . . . , Anx E, 1/1.

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