

# ARMOUR BULLETIN

2007 - 2008



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The *Armour Bulletin* is published to provide information of professional interest and as a forum for the exchange of ideas and opinions. The views and opinions expressed are those of the authors and do not necessarily reflect official Department of National Defence policy.

## Article Submission Requirements

The *Armour Bulletin* welcomes articles and comments on topics relevant to the Armour Corps. The editors ask that the following guidelines be followed:

- Articles can be submitted in either official language;
- Only material of an unclassified nature should be submitted;
- Articles should be between 500-1500 words and submitted electronically to the editorial staff. Images and endnotes should not be embedded in the text;
- Photographs must be accompanied by the name of the photographer. Please note that you have unrestricted use of the *National Defence and Canadian Forces Image Gallery* ([www.forces.gc.ca](http://www.forces.gc.ca)) so long as you cite the photographer;
- Comments may be submitted directly to the editorial staff, preferably via email;
- The editorial staff reserves the right to deny the publication of an article/comment or to edit articles/comments for content and/or length; and
- Each article must be accompanied by a brief biography and recent photograph of the author.

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## About the Cover:

A Canadian Leopard 2 tank from C Squadron, LdSH(RC), fires during range exercise to adjust the 120-mm guns, near an advanced operations base in the Panjwayi district of Afghanistan, 14 Feb 08. (Photo Cpl Simon Duchesneau HQ, JTFA, Roto 4).

## 2008 - 2009 Armour Bulletin

The next edition of the *Armour Bulletin* will be composed of articles depicting the diversity of tasks conducted by Armour personnel and organisations. Some topics for consideration are: Recce lessons learned in Afghanistan; Employment of Armour personnel in non-doctrinal roles; Coyote and Leopard maintenance lessons learned (domestic and deployed); Use of Simulation in individual training; and Corps Structure(s) 2011 and beyond.

Please submit draft articles no later than **30 Jan 2009**. See the article submission requirements above for details.



**Director of Armour's Foreword**  
**By Colonel L.W. Thomas, CD**

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Fellow Black Hats,

It is certainly a privilege to be addressing you in this forum for the first time in my tenure as Director of Armour. It is no coincidence that this edition of the Armour Bulletin is focused on tanks. With the first deployment of Canadian tanks in combat since the Korean War and the purchase of new tanks in the form of the Leopard 2, we are in the midst of a massive revitalization within the Corps. We continue to re-learn old lessons while striving to meet our force generation and training requirements. The contents of this edition are an attempt to generate discussion and collectively come to grips with many of the issues facing the Corps and should be read with enthusiasm.

In exploring key topics surrounding the re-birth of tanks as a priority in our Corps, we will examine their deployment on operations from the Canadian perspective in addition to the employment of tanks in urban operations. We will also take this opportunity to look at the impact of the Leopard 2 by exploring such issues as their future distribution amongst the regiments to potential changes in the way we conduct individual training for our tank crews. The Armour Bulletin is an excellent means of generating discussion of important topics within the Corps and I encourage you all to become future contributors to this excellent publication.



## **Outgoing Colonel Commandant's Foreword**

### **By Colonel P.W. Hunter, CD**

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A short two and a half years ago, the Army's Force Employment Concept outlined a vision that included "moving to a medium-weight, mobile, lethal force". In other words the tank as part of the Canadian Army's order-of-battle and a component of the combat arms team was dead. Indeed, our aging fleet of Leopard tanks were either being dismantled or converted to monuments.

Then a remarkable thing happened. Canadian soldiers, mostly infantry, in Afghanistan realized they needed the direct fire support that only tanks could provide. The call went out from Afghanistan to NDHQ, where the requirement was quickly acknowledged and the Armoured Corps was challenged to put its Leopards back into fighting condition, prepare crews to operate them, and move a battle-ready squadron (17 tanks) to Afghanistan in the late fall of 2006. This almost unachievable task was achieved, and huge credit must be accorded to all who were involved in making it happen. The truth was admitted: Canada still needed tanks – and the Armoured Corps met the call.

Since then, it became apparent the old Leopards were insufficient in capability, resulting in Canada leasing 20 Leopard 2A6 tanks from Germany. And more latterly the Department of National Defence has purchased 100 virtually new Leopard 2's to be located in Canada shared by the three Regular Armoured Regiments, the Armour School and the Army Training Centre at Wainwright. In short, Canada is back in the tank business.

This issue of the Armour Bulletin will examine the re-emergence of the tank as an essential and vital component of the combat arms team; the dramatic and positive impact and changes this return of tracked vehicles will have on our Corps; the balance necessary between armour and reconnaissance; the evolution in training programs to properly prepare our (tank and recce) soldiers to perform with excellence in the Contemporary Operating Environment; changes in former armoured doctrine, or rewriting doctrine, necessary to ensure excellent performance in today's fighting circumstances e.g. urban ops, lessons learned from the field, and potential new circumstances in which the Corps might be asked to perform.

The immediate requirement is to answer these, and other questions, in relation to current circumstances and deployments in order to ensure the Corps fully meets and completes the missions and tasks assigned to it. But there is another component to the study, thinking and work we must do. That is: What will be the role of Armour in the future? What type of AFVs will we need to do our job in 2015, 2020, and beyond? What kind of missions and assignments might come our way? These questions and many more must be addressed – and answered. In the past, most recently the Mobile Gun System concept, the thinking and the answers have most often come from outside the Armoured Corps. To secure our future, and make our best contribution to the Canadian Army, we must take leadership in planning our destiny and how best the Royal Canadian Armoured Corps fits into the overall scheme of things. We are the best qualified to do this. To leave it to others is irresponsible and will likely lead to decisions that are wrong e.g. MGS at worst or inadequate or not to our liking at best. We in the Corps must control the process, if we do not, we are derelict in our duty.



This issue of the Armour Bulletin starts the process. Let us take full advantage of the opportunity it presents and ensure our tanks, or their appropriate successors, are with us well into the future – as far as we can see.

Worthy!

Peter W. Hunter  
Colonel Commandant

*Editor's Note –*

The Corps was saddened to learn of the death of Colonel Peter W. Hunter (Retired) on July 2, 2008. Col Hunter had a distinguished record of service in the military, corporate and volunteer sectors. He served as a former Colonel Commandant of the Royal Canadian Armoured Corps, Past Commanding Officer and Former Honorary Colonel of the Governor General's Horse Guards.



**Incoming Colonel Commandant's Foreword**  
**By Major-General (Ret) C.J. Addy, OMM, OSTJ, CD**

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It is with great pleasure and pride that I address you in this forum for the first time as Colonel-Commandant. My appointment to this post was a humbling honour and one that I was delighted to accept.

The last several years have been exciting ones, with tremendous change for the Corps. With the return of the Tank as a key element in current operations, we have returned to our grass roots. Welcome back, Trooper Leopard! The acquisition of the Leopard 2 and its service in Afghanistan has been both exciting and challenging. It will be more so as we prepare to receive it in Canada. Our Reconnaissance Squadrons continue to play a key role with deployed Battle Groups in theatre, providing the commanders a superbly flexible manoeuvre sub-unit with a tremendous ability to influence events on the ground. The adaptability of Armour and Armour Reconnaissance, inherent and ingrained through years of training and operations, has once again proved an invaluable asset and an essential complement to our fellow arms on the battlefield.

The tempo of operations for the members of the Corps has seldom been higher, but with the support of the public and government, morale is remarkably high. I have witnessed this myself when visiting the Regular and Reserve force units since assuming this post and I look forward to seeing all units at work in the near future. Training at the Armour School continues to be of high calibre and adjustable to the needs of the field force to produce the top quality crewmen, NCOs and officers our Army needs. The Reserve Units and members of the Corps continue to play a key role in operations and training at home and abroad, and will continue to do so with the increased tempo necessary to sustain our future missions. Without this dedicated hard work and competence from our crewmen, NCOs and Officers, the Corps could not complete its assigned tasks.

I look forward to serving all members of the Corps and to helping shape and influence the Corps within the Army during my tenure as your Colonel-Commandant.

I salute you all, and your families, and I pause to recall the loss of my predecessor and friend, Colonel Peter Hunter.

Worthy!



**Editor – in – Chief's Foreword**  
**By Lieutenant-Colonel M.A. Nixon, CD**

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It gives me great pleasure to offer you a venue such as this to discuss topics of interest across the Armour Corps. With tanks being deployed into Afghanistan and with the recent purchase of the Leopard II, what better way to discuss the continuing evolution of the Corps in light of current operations.

Many thought that the days of heavy armour being deployed by the Canadian Forces in a combat zone were over and that reconnaissance would be our niche well into the future; how quickly things for the Corps have changed for the better!!!

The Summer 2008 edition of the Armour Bulletin will focus on this change, specifically focusing on some perspectives of the “tank” on operations in the modern environment. This focus will include a look at the always important echelon system, which once again has proven to be critical to our success on the battlefield.

As with any Armour Bulletin, I encourage you to provide feedback on the articles presented whether positive or negative. I would also ask that should you find yourself with some additional time, that you consider putting pen to paper and engaging the Corps, its soldiers and leadership, in professional discussion. I will continue, at every opportunity, to solicit your support in producing this journal.

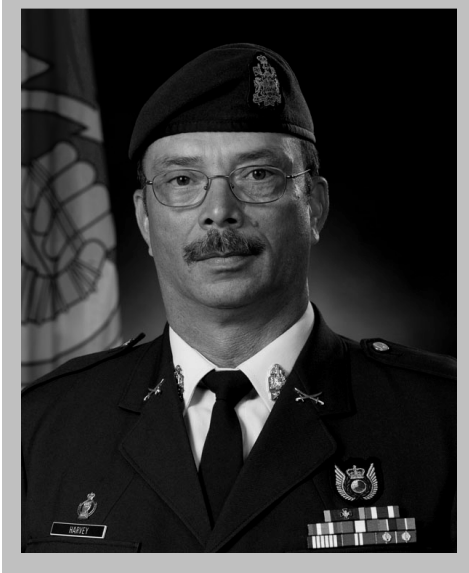
The Armour Corps, while old in tradition, continues to transform to meet the ever increasing demands of a complex and challenging operational environment against a determined and adaptive enemy. It is hoped that the articles contained within will spur discussion and help as we move forward.

Worthy!!



**Corps Sergeant Major's Corner**  
**By Chief Warrant Officer D.R. Harvey, MMM, CD**

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Once again it is a pleasure to address you in the Armour Bulletin. This edition of the Armour Bulletin will address the training issues that come with fielding a new Tank in more detail at the same time it explains other issues that come with this complex piece of equipment. It has become quite evident that business in the Corps has changed in the past few months as we become more proficient on yet another tank. The Corps has trained on four different Tanks in the past 30 years with each bringing their own challenges. The major difference this time is that this is the first time where we have trained on one platform then traveled to another country to be qualified on the new platform then deployed on operations using both the old (Leopard C2) and the new (Leopard 2A6M). Having said that it is easy to see why the morale remains high.

The other side of keeping pace with the tempo related to operations today as well as training on a new platform is the rate of promotions. We are being faced with a forecasted rate of promotions which has not been seen in some time creating another training issue when we look at the number of Master Corporals and Sergeants required in the very near future. Although this may be very challenging it is a welcomed task as we need to prepare our future Crew Commanders and leaders. This I am confident we will be able to accomplish with some short term pain and a fair bit of creative management on the hides of many.

In my time in the Corps there have never been two more welcomed challenges and there has never been a more exciting time to serve. I would encourage all to remain focused on the task at hand as we (The Corps) are the ones who will benefit from this era. You should all be commended on your efforts as we traverse through the very challenging and rewarding time.

Chief Warrant Officer D.R. Harvey, MMM, CD



## **Development of Individual Training for Leopard 2**

### **By Captain B. Corbett, CD**

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**Capt Brian Corbett is currently posted to the Directorate of Land Requirements as the Training Manager for the Leopard 2 Project and is heavily involved in Leopard 2 conversion training in Germany.**

#### AIM

The intent of this article is to discuss the development of individual training for the Leopard 2 tank and investigate training and simulation tools to enhance training effectiveness.

#### BACKGROUND

Much of the background to the tank replacement project is already common knowledge. The Army has borrowed twenty Leopard 2A6M (M standing for Mine Protection) from the Germany Army. Prior to being sent into theatre a limited number of Canadian specific upgrades were made to the vehicles including installation of Canadian communications equipment and the addition of slat armour around the sides of the turret and hull. At the time of writing the first four tanks and two ARV were in Afghanistan with the remaining vehicles en route to theatre.

The second part of the Project involves the purchase of 100 surplus tanks from the Dutch Army which includes: 20 Leopard 2A6 and 80 Leopard 2A4. Of the 80 Leopard 2A4s some of them will be upgraded to a deployable standard, some will be used as a trg fleet (with the extent of upgrades unknown) and 20 have been designated to become variants such as ARV or potentially AEV and AVLB. The final configuration for the tanks and the extent of upgrades will depend upon not only the needs of the Army but must also what is affordable within the project budget of \$650M.

The project does not know when tanks will be available in Canada to begin training. In order to properly field the tanks several things must be in place including adequate spare parts, maintenance support and complete training packages.

There are two main aspects involved in the development of individual training for this project. The first is the immediate operational requirement to train soldiers for each rotation into theatre. The second is the steady state training requirement to ensure that the Corps is able to support its own training when the tanks arrive in Canada.

#### DISCUSSION

##### Training for Immediate Operational Requirements

The first training serials have already been conducted. Initial Cadre Training (ICT) was completed in May 07 at the Dutch Armour School where a team of Instructor Gunners (IG) developed a Canadian version of the Leopard 2 turret drills and





procedures. During the summer of 2007, twenty crews from C Sqn LdSH(RC), including a full troop from each of the RCD and 12<sup>o</sup>RBC, conducted training at the German Armour School (Panzertruppenschule) in Munster Germany. This training was conducted by the German Instructors with the support of the Canadian IG trained during ICT

The next two rotations (TF 1-08 and TF 3-08) will also be trained at the German Armour School. Following the training conducted for TF 3-08 our agreement with the German Army to provide training will be finished. It is unlikely, at the time of writing, that tanks will be available in Canada for several years, therefore it is foreseen that subsequent Task Forces will also need to be trained in Europe by an allied nation. Negotiations are on-going to determine which other countries are able and/or willing to assist in training our soldiers prior to deployment. (Editor's note – Since writing

### Steady State Training

General. The Project staff in conjunction with the Directorate of Army Training (DAT), the Army Individual Training Authority (AITA) and the Armour School as Centre of Excellence (CofE) are working to develop a training framework for the delivery of training over the long term. This analysis will for the most part follow the Army Systems Approach to Training (ASAT) and investigate a variety of options including how to leverage modern technologies and the advantages of computer based instruction.

Collective Training. Fielding of Leopard 2 should not require changes to current Canadian doctrine and therefore it is anticipated that introduction of the new tank will have a minimal impact on the current collective training framework. From a project perspective, the Leopard 2 will need to be fitted with the WES system, and other options to improve collective training will be investigated but these will not have a significant impact on the overall conduct of collective training.

Individual Training. A draft Training Needs Analysis (TNA) developed by DAT has made recommendations on the training structure for Leopard 2. The crews will be qualified in four separate IT courses.

- a. Driver Course. This will follow a similar format to current Leopard driver courses. Although the vehicle sub-systems and driving techniques employed with the Leopard 2 are significantly different from those used with the Leopard C2, there is no need to change the overall training philosophy;
- b. Turret Operator's Course. The turret operator's course will qualify junior NCOs as both gunner and loader, in addition it will give them some familiarization training on the Crew commander's Fire Control System (FCS);
- c. Crew Commander Gunnery. This will qualify crewman to operate the commander's FCS and supervise the crew during gunnery engagements; and
- d. Advance Gunnery Instructor Course (AGIC). Modifications required to update the AGIC course to include Leopard 2 are still in development.

Tactics Training. It is important to note that the courses mentioned above focus on gunnery. DP3 ARCC and DP1 AOCC Mod 1 and 2 will remain the primary qualification courses for tactical training at the crew commander and Tp Ldr level. Following their crew commander qualification, crewman selected for tank training will conduct their respective gunnery courses followed by a tank commander tactics package to teach tank Tactics Techniques and Procedures (TTP) within a Troop and Squadron context.

### Training and Simulation

General. To enhance training a variety of training and simulation tools will be required. The project budget for training and simulation is very limited and it must be understood that not all training and simulation assets will be affordable. Requirements will need to be carefully defined in order to optimize training effectiveness.

Live-Fire Monitoring Equipment. The blast overpressure generated by the 120mm gun is significantly higher than that generated by the 105mm gun. Therefore, an IG is not able to sit on top of the turret during live-fire ranges to assess students or ensure safety. One method to provide this type of monitoring is through the use of live-fire monitoring equipment, an example of which is shown in Figure 1. The tank is instrumented with through-sight-video, and linked into the FCS so that data is transmitted back to a monitoring station behind the firing platform. From the monitoring station the IG can listen to the radio and IC traffic as well as monitor the status of the FCS and the point of aim for both the gunner and the crew commander. The IG is also able to record the engagements, including voice procedure for detailed AAR.

Figure 1: Live Fire Monitoring Equipment. (Photo Credit: WO Pierre Nadeau, Armd Sch)



Gunnery Simulators. As demonstrated by the use of Leopard Crew Gunnery Trainer (LCGT) since its introduction in 1999, gunnery simulators are very effective for increasing student confidence and improving results on the live-fire range. Procurement of a gunnery simulator or upgrade of the existing LCGT to match the layout of the Leopard 2 turret will be included as part of the project. The exact number of gunnery simulators required and their distribution across the Corps will need to be re-confirmed.

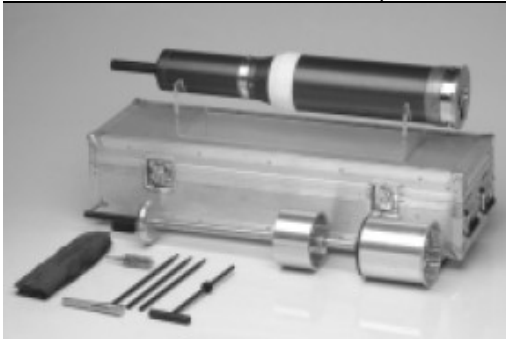
Driver Training Tanks. Although the decision has been made not to procure driver training tanks, shown in Figure 2, as part of initial project fielding, the requirement still exists to provide instructors with the ability to effectively and safely teach drivers how to operate the vehicle and troubleshoot faults while driving. In addition, in order to effectively teach students how to negotiate obstacles, the instructor requires the ability to take control of the tank and demonstrate proper handling techniques.

Figure 2: Driver Training Tanks (Extracted from: <http://www.kmweg.com> on 25 Oct 07)



Training Ammunition. 120mm training ammunition is very expensive, some natures being almost twice the cost of their equivalent 105mm counterpart. A number of options will be investigated to allow crews to complete a large number of engagements and gain confidence with the equipment, while minimizing the amount of 120mm ammunition that must be fired. Some of the options being investigated include: sub-calibre training systems and using WES as a precision gunnery trainer. An example of a sub-calibre training system as produced by Israeli Military Industries (IMI) is shown in Figure 3.

Figure 3: 20mm sub-calibre training system (Extracted from: <http://www.imi-israel.com/Business/ProductsFamily/Product.aspx?FolderID=267&docID=651> on 25 Oct 07)





Computer-Based Instruction. Advances in computing technology and 3-D imaging have enabled some amazing developments in the effectiveness of computer-based instruction. Technology has moved well beyond the PowerPoint presentation which is little more than an electronic OHP slide. In some cases, where equipment sub-systems are hard to access on the real vehicle or due to lack of available resources, some training can be more effectively accomplished using computer-based instruction. Computer-based instruction can also be used for refresher training or professional development. With regard to individual training for Leopard 2, the following are two examples where computer-based training could effectively be employed:

- a. Support to Driver Training. Many of the Leopard 2 sub-systems are difficult for instructors to teach because they are hard to access on the vehicle (The hull's central hydraulic and braking system is one example). Using computer software that allows students and instructors to manipulate 3-D models students will understand and retain the knowledge much better than via previous teaching methodologies; and
- b. Tactics Training. The Armd School is already using Virtual Battle Space 2 (VBS2) and Steel Beasts to conduct some tactics training and refresher prior to courses going out into the field. It is anticipated that these types of simulations will be used to teach initial tank tactics to crew commanders and troop leaders.

### CONCLUSION

There are still many aspects of the project that remain unknown, the final configuration and distribution of tanks being two key decisions that have yet to be made. That being said, the project staff will continue to work with DAT, AITA and the CofE to develop a training framework and ensure that the Corps is properly prepared to begin implementation of Leopard 2 when deliveries begin.



## **Tank Squadron Sustainment**

**By MWO W.J. Crabb, MSM, CD & MWO A.B.K. Mulhern, CD**



**MWO Crabb was the SSM for A Sqn LdSH(RC), Op ATHENA Roto 3 and is currently employed as SSM HQ Sqn LdSH(RC).**



**MWO Mulhern previously served as SSM for HQ Sqn LdSH(RC), and is currently employed as the Training Officer at CFB Kingston.**

### INTRODUCTION

The Canadian Forces recognizes six combat functions; command, manoeuvre, information operations, firepower, protection, and sustainment, which together form the basis of combat power.

The sustainment of a Tank Squadron is a convoluted and complex process. Before a demanded commodity reaches the squadron it must go through a number of steps. In this paper we will visit briefly the main steps of the process and review them briefly before the theatre specific sustainment of a Tank Squadron deployed to Afghanistan is examined.

### BACKGROUND

The operation of armies have been influenced, and in many cases controlled by the necessity of providing and distributing food, fodder and stores for men and equipment. In the modern era these supplies have become more varied as weapons have developed in complexity and power. The branches of an army which are tasked with the responsibilities of "supply and transport" have had to become very specialized to meet these changing needs.

The armies of the middle ages lived off the land that they were campaigning through. This method of sustainment reached its utmost limits during the Thirty Years' War (1618 -1648). During the last stages of the war Germany had been so thoroughly devastated that the armies marching around the country were characterized as a pack of hungry wolves.

The early 19th century marked a period of time where the nature of warfare was revolutionized by the actions of pioneering strategic thinkers such as Napoléon Bonaparte (1769 – 1821) and Helmuth Karl Bernhard Graf von Moltke (1800 – 1891) and by the writings of theorists such as Carl Philipp Gottlieb von Clausewitz (1780 – 1831) and General Baron Antoine Henri de Jomini (1779 – 1869). During this time operational support theory and doctrine were primitive to say the least. Armies of this period began to re-evaluate how best to organize their operational support requirements. As armies became more sophisticated their transportation requirements also increased. The need for a dedicated and reliable military transportation organisation became obvious. The Austrians had established a supply corps in 1783 with the task of obtaining supplies in situ rather than from forts or magazines. The first dedicated British unit formed was the Royal Waggoner's in 1794.

In Canada, the Militia Act of 1868 provided for the formation of various support services, including a military train, on a required basis. This provision, however, was never enacted, hence for most of the early history of the Canadian Army, the provision of transportation was a Commissariat function and they contracted for services. As a result, when the Riel Rebellion (1885) broke



out, the Canadian Militia was forced to contract the Hudson's Bay Company to provide the transportation services for the force. Despite continual warnings that the Canadian Militia could not deploy to the field and support itself, it finally took the threat of war with the United States due to the Venezuela Scare (1895) and the outbreak of the Boer War (1899 – 1904) to finally convince the Government of Canada to form support forces.

When the First World War broke out in August of 1914, the Canadian Permanent Army Service Corps (CPASC formed in 1901) and Canadian Army Service Corps (CASC) had approximately 3,000 members. By 1918, this had increased to over 17,000. The first contingent of the Canadian Expeditionary Force (CEF) sailed for England in October 1914. Renamed the 1st Canadian Division, they deployed to France in February of 1915. The CASC elements of a Division consisted of a Train (HT), a Supply Column (MT), an Ammunition Sub-Park (MT) and a Reserve Park (HT). There were also Lines of Communications troops, such as Depot Units of Supply, Field Bakeries and Field Butcheries. By 1918, the CASC was supporting 400,000 men, 150,000 French civilians and 25,000 horses. Recognition of the Corp's outstanding work during the war came in November 1919 when His Majesty, King George V (1865 – 1936), awarded the designation "ROYAL" to the CPASC. These successes survived the post war period when money for defence was in short supply and modernization was almost impossible. The successes of the First World War were continued on throughout the Second World War.

In more modern time these successes continued with operations starting with the police action in Korea (1950 - 1954). Canada formed 25 Canadian Infantry Brigade (CIB) with the Royal Canadian Army Service Corps (RCASC) contribution of 54 Canadian Transport Company and 38 Motor Ambulance Company. This was followed by debatably the most significant of Canada's early peacekeeping missions in 1956, when a dispute with Egypt's President Gamel Abdel Nasser (1918 – 1970) over the ownership of the Suez Canal threatened the stability of the Middle East. The Suez Crisis pitting the British and French, with Israeli support, against the Egyptians and threatened to plunge the world into another unwanted war. Lester Pearson (1897 -1972), president of the UN General Assembly and future Prime Minister of Canada (1963 – 1968), met with the United Nations and suggested an international peace-keeping force to supervise the withdrawal of the combatants. The proposal was agreed to by the UN; the peace-keeping force included and was led by Canadian troops. For his efforts, Lester Pearson was awarded the Nobel Peace Prize in 1957. As a result the first United Nations Emergency Force (UNEF 1) was deployed to the Sinai Desert. Since that first deployment Canada has had a history of nearly fifty years and approximately thirty-five missions supporting world peace through military operations under the sponsorship of the United Nations. The Canadian Forces has gained over the years a reputation for providing an excellent level of sustainment for our troops when they are deployed on operations. In the mid to late 1990's Army doctrine had to change with the acceptance of manoeuvre warfare as the basis of our operational and tactical level doctrine. During this same timeframe the impact of the downsizing of the Canadian Forces following the collapse of the Soviet Union, harsh budget constraints and increased activity in Peace Support as well as Domestic Operations led to a substantial change in our approach to future operations.

Today our military forces, be they deployed overseas or within Canada, must be logistically supported. It would be inconceivable to deploy a formation, be it a Battle Group or a Squadron within a Combat Team, without a thorough consideration of how and by whom the force will be replenished, how casualties will be evacuated to the proper aid services and how vehicles and equipment will be repaired or replaced.

The fundamental of sustainment have continued to evolve with experience and lessons learned from deployments. The basic fundamental are as follows:

- a. Foresight – Foresight is composed of two factors; planning and execution;
- b. Economy – Economy of limited sustainment resources is achieved by the centralization of their control;
- c. Flexibility – Flexibility means the ability to correspond to the plan regardless of any unanticipated changes;
- d. Simplicity – A sound CSS plan demands simplicity. A simple yet flexible plan should withstand any unforeseen problems;
- e. Co-Operation – Co-operation between all levels of staff and commands will greatly improve the sustainment of the troops. It is the responsibility of commanders to ensure this close co-operation is planned and co-ordinated; and
- f. Self – sufficiency – Self-sufficiency means that the troops initially have at their disposal the essential resources for combat, for a period of time determined by the commander.

The sustainment concept is the product of a consideration of the threat and the above mentioned fundamentals. The system has been designed to provide the required CSS to combat formations, read Regiment, and is based on the following tenets:

- a. A single, seamless support system (from Canada to the soldier);



- b. Forces will be forward supported as much as possible;
- c. Sustainment must utilize the principle of augmentation forward;
- d. Sustainment must support not hinder the commanders operational plan;
- e. Sustainment must be forward thinking to ensure maximum flexibility for the dynamic battlefield; and
- f. Canadian formations working within a coalition force will always require a pipeline for Canadian unique items provided from Canada regardless of the structure of the supporting organization.

Now that we have reviewed the fundamentals of sustainment we must have the same familiarity with the role of the replenishment system. The role of the replenishment system is to provide the troops with the combat supplies, general, tactical and defensive stores and materials required to fight. The system is the process by which combat supplies, defensive stores, repair parts and general and technical stores are provided to the fighting troops.

The replenishment system should be an uninterrupted, forward looking process, which has been compared to that of a wide mouthed funnel. At the wide end is the Canadian strategic resource base, the Theatre Logistics Base (TLB) and the different sources of supply which can range from the Host Nation Support to Canadian industry. At the narrow end are the Close Support (CS) replenishment elements that deliver the required supplies to the Regiment which then push them forward to the Tanks Squadrons. Each successive level of said funnel becomes more and more sophisticated and complex as one travels further back from the FEBA. Whereas when you move forward to the Tank Squadrons in the F echelon it becomes less and less complicated. The system is designed so that higher levels support lower levels. In this fashion, the system will provide for a seamless flow of the materials that are required by the fighting troops.

Commanders at all levels must routinely assess the readiness of their troops from the perspective of combat supply holdings and be prepared to adjust it as the situation necessitates. "How much to hold and where," In the Army, units will continue to carry a basic load spread out through its F, A1, A2 and B echelons while higher formations will hold the maintenance load in CS units. The basic load that is usually carried equates to the scale of material carried by Regiment to assure a degree of self-sufficiency. This basic load generally amounts to three days of combat stores. One must remember however that certain types of stores and equipment are considered as "Controlled Stores". There are two types of controlled stores: controlled and rationed stores. Controlled stores are items of a **high operational significance** such as vehicles, weapons and major assemblies that requires the release authority of the applicable formation headquarters operations staff. Rationed Stores are items in **short supply** such as canvas tents or hand tools, which require release authority from the supply staff at various levels of headquarters.

There are presently two levels of replenishment: strategic and operational. Strategic level replenishment involves the full energy of the nation including the political and industrial complexes. Operational level replenishment commences with the movement of material forward of the TLB (Theatre Logistics Base) and is completed with the delivery of material to the Regiment and then by utilizing the echelon system down to the Tank Squadrons. The bridge between these two levels of replenishment is the Sustainment point. Sustainment points are used to provide immediate replenishment of combat supplies and a limited range of critical, fast-moving items that are demanded by formation forward of it. They are also the points from which CS replenishment elements draw non-combat supplies that have been demanded by the Regiment.

Tactical Delivery Operations are the "nozzle" used by the replenishment system. Tactical delivery operations include the following:

- a. Delivery Points (DP). DP's are points where CS replenishment elements deliver multiple classes of commodities to Regimental Transport. These points offer a number of benefits due to the fact that you only have to occupy terrain for a limited amount time. They also minimise the movement of administrative traffic in Combat Zone.
- b. Commodity Points. Commodity points are platoon-sized points that usually stock one type of combat supply, such as ammunition. The sighting and defence of these points are usually conducted by CS replenishment resources.
- c. Dumps and Dumping Programs. Dumps are temporary storage areas for any commodity that needs to be stockpiled. This entails a high degree of risk and their usage must and should be carefully considered.

Tactical replenishment involves the daily filling of the Regiments demands by the CS/General Support (GS) replenishment elements. Tactical replenishment of the Regiment will usually occur on a 24-hour cycle. Items, which represent immediate operational requirements (IORs), will usually, dependant on the tactical situation, be delivered as soon as practicable by GS elements. All classes of supply are delivered by the system less medical supplies, which are the responsibility of the Health Services Support system. Combat supplies (fuel, ammunition, rations and water) are normally set apart for delivery because of their high rate of consumption. These supplies are "fast tracked" by the system to ensure daily delivery. The remaining classes



are generally affected by pull replenishment and they include: general and technical stores, defence stores, engineering stores, repair parts, and major end items.

The replenishment system as stated has been compared to that of a wide mouthed funnel at the strategic level and narrows at the tactical, Regimental level. It is at the Regimental level that we are most familiar. It is then moved onto the Tank Squadrons via Headquarters Squadron and the echelon system. This push or pull dynamic of sustainment is the frame work for the standard replenishment system but based on our present operational deployments to Afghanistan we must visit theatre specific replenishment of a Tank Squadron.

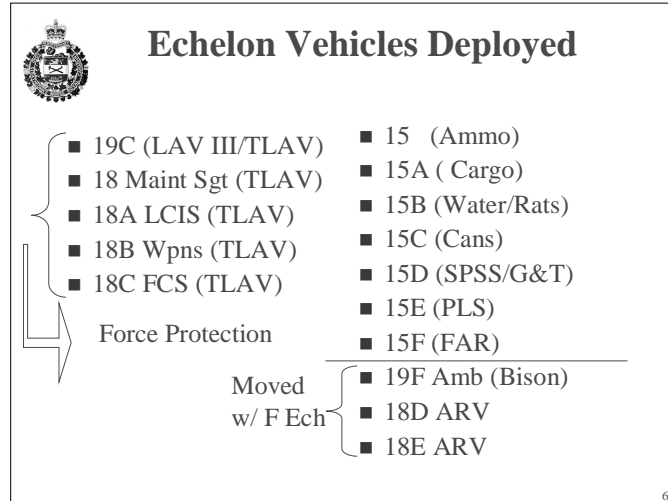


### TANK ECHELON OP ATHENA ROTO 3

Although this echelon was a Tank Sqn Echelon it was necessary to employ it as you would a Recce Sqn Echelon due to the nature of Counter Insurgency Operations where there is no secure rear area or even a FEBA to operate behind. In other words it was necessary to escort every echelon vehicle moving on a task with at least 2 others for security, limiting the amount of tasks the Ech could perform concurrently.

### Vehicles

The Sqn echelon when deployed consisted of the following vehicles:



This was the basic setup of the trucks however the HLVW configurations were often changed depending on the requirements of the operation.

We would always take the minimum amount of vehicles required for each operation; this reduced unnecessary risk and allowed the escort to be more effective by protecting fewer convoy vehicles.

Water and fuel were the 2 commodities that caused the most concern as the Squadron would be crippled without either. There was always a redundancy built into plans such as cross loading to ensure we would not run out of either.

The Tank ammo carried was 90% HESH, 8% Smoke, and 2% Sabot. As well as the other natures of small arms and Pyro the Sqn required. There was a second upload of ammo held at the FOB. Several times depending on the nature of the operation we downloaded some tank ammo and uploaded Infantry / Engineer ammo to limit the number of vehicles required to resupply the Combat Team.

The ambulance and the 2 ARVs travelled with the F Echelon and not with the A1. The SSM had a LAV 3 as well as a TLAV RWS available to use; 95% of the time the LAV 3 was used due to the optics, weapon, and stab system. The Sqn had a PLS cut to it as there was a requirement to move the rollers to and from operational areas, as well as be prepared to use them for a QRF task.

Personnel

The drivers for the trucks came from the NSE at KAF on a rotational basis. This caused issues as we were always training new pers in how the Ech moved, protected itself, and supported the Sqn. If we had to move the bulk of the trucks we needed to find co-drivers from crews with broken tanks or from the company we were working with. One of the roles of the echelon has always been to provide immediate replacements for Sqn casualties but with the Ech made up of MSE Ops that was impossible. This resulted in tanks being parked for lack of a single crewmember.

Force Protection

Force protection for the echelon was generally 1 to 4 TLAV RWS and the SSM's LAV 3. Whenever possible we would have a section of infantry or some other arm attached to us. The problem with not having these other assets is when you must stop with only 2 pers in each TLAV and truck there are not enough boots on the ground to effectively deal with the threat especially near built up areas and on busy roads. If there were no atts available we always tried to bring pers from the FOB to assist if required.

MOVEMENT





## Movement

- Normal spacing of 50-75 m between vehicles worked well on and off road.
- Lessons learned in C-IED trg are valid.
- Observe pattern of life.
- X-Country stay in the veh tracks created by lead veh (mine/IED threat).
- Be wary of all defiles (i.e., wadi/karez crossing sites). Conduct vulnerable pt search.
- Do not set pattern/use same rte (i.e., turn-off points from hwy).

Lord Strathcona's Horse (Royal Canadians)



## Convoy Briefing

1. Route
2. Threat
3. Actions on contact
4. Order of march ( keep copy handy)
5. Chain of Command
6. Speed and Spacing
7. Actions on arrival at destination

Note: Treat every move as a cbt op. Issue orders/comprehensive brief prior to moving to avoid complacency.

Lord Strathcona's Horse (Royal Canadians)



19C   15   15C   18A   15B   18C

Note: Ech composition is dependant on the op. The above example is minimal with just ammo, fuel, and water/rats. Having the LAV 3 in the rear allowed for defence of the echelon with full SA and a stabilized weapon system, as well as providing a rear facing sentry.

10

When traversing open desert it was easier for the SSM to lead as he was constantly trying to find good ground for the trucks especially the Top heavy FAR. There are numerous small wadis and karez systems that make movement difficult by day and hazardous by night. As well it is just as easy to protect the Ech from the front in open country.

### 3 Echelons

The B echelon was back in KAF controlled by the Sqn 2IC and SQMS. They received supply requests from the Sqn and parts requests through the SPSS pers. They then ensured the supplies were loaded on the Combat Logistic Patrols ( CLP).



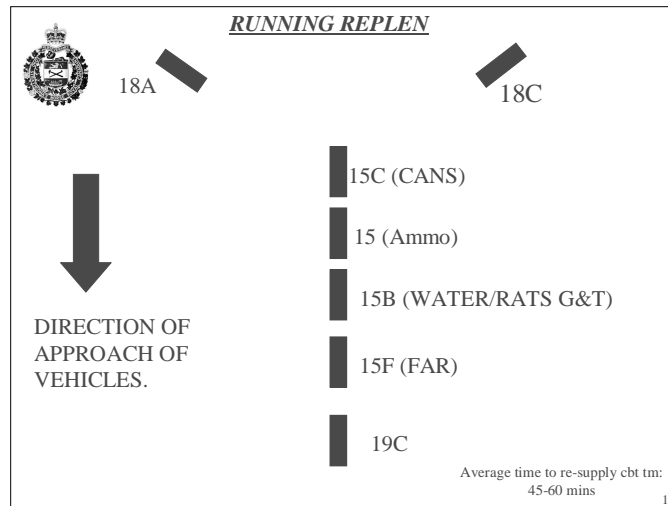
The function of the A2 Ech was actually performed by the National Support Element by the use of CLPs. These convoys of 9 to 11 vehicles would bring supplies from KAF to the Forward Operating Bases several times per week. Due to the size and volume of tank parts the Sqn had its own truck on every CLP which made it easy to get our supplies forward, other sub units supplies were sent forward on a space available basis by priority.

The A1 echelon would dependant on the mission either be based from the FOB and move forward to the Combat Team or live with the Cbt Tm and move back to a FOB as required for supplies.

Running Replenishment

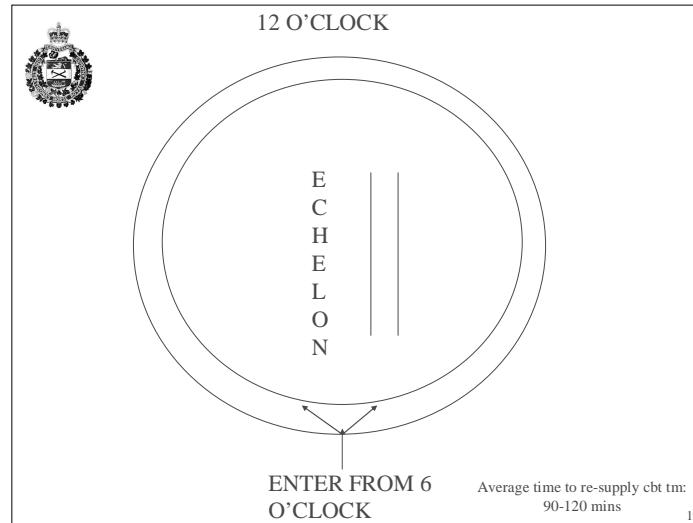
Although a little unconventional this setup worked best for a mixed fleet of vehicles.

1. Initially the Cbt Tm must top off vehicles from Jerry Cans prior to arrival at RR. This normally topped up the LAVs, G-Wagons, and Bisons.
2. As the Cbt Tm came in the tanks would bypass the cans truck unless they needed commodities, the LAVs and other vehicles would stop and exchange cans.
3. As the tanks would take long time to fill at the FAR this setup allowed other call signs to carry out re-supply concurrently behind them.
4. Once the LAVs reached the FAR they could finish topping up if the cans didn't fill them.
5. If the Cbt Tm required ancillary maint services this could be pre-arranged prior by radio and an area could be cleared and set up.


 Average time to re-supply cbt tm:  
 45-60 mins
 

LEAGUER

The Squadron utilized a circular leaguer which allowed greater flexibility, observation, and protection than traditional square leaguers. Once the leaguer was established the A1 Ech would enter from the 6 O'clock with the fuel going right and ammo and water going left around the inside. The SSM brought the remainder up in the left center of the circle. Troop and Platoon WO's dropped off stores and fault sheets while picking up ADREPs. Maintenance pers would then carry out all possible repairs. Once complete the Ech could either stay in the leaguer or move off for subsequent tasks.



### RECOVERY/MAINTENANCE

The bulk of the Squadron maintenance was carried out in the FOB. The Squadron had 5 spare power packs which were sent back to KAF for second line repairs. The ARV carried a pack on the deck for extended ops but not during local ops. Second line weapons and FCS repairs were carried out in the FOB including turret pulls as there were no qualified techs in KAF.

When a tank went down on ops it was pulled to a safe area by the ARV or Badger and if unfixable in situ would be recovered to the FOB by towing or we could request a recovery by HETT (Heavy Tank Transporter). As the HETTS were normally located in KAF this was a time consuming option and the BG was forced to escort it.

The echelon carried many spare parts such as road wheels, support arms, idlers, and spare pieces of track. This allowed us to fix most mobility issues in the field.

### CASUALTIES

When the Combat Team had casualties they were normally extracted by a helicopter from KAF. As the MEDEVAC 9 liner constantly evolved you needed to be up on all changes to ensure a speedy evacuation. If there was essential information missing the aircraft would not fly. Using the 2 ambulances available to the Combat team we were able to move casualties to a secure LZ while leaving ambulance support forward. Severely injured were always flown out and if space was available we would load other casualties as well. Casualties who were Vital Signs Absent required their own bird or if required we could transport them out in the ambulance post operation.

### SUPPORTING OTHER UNITS

The echelon was utilized in several instances to support Afghan National Army, American, British, and Portuguese forces. Though achievable there were problems with comms, language, and different supplies such as food and ammunition. As these ops were well planned and executed they were successful. Due to the fact that the NSE could not support past the FOBs and the Battle Group did not have an Admin company the Sqn echelon became a critical asset supporting most sub units at one time or another. As well, when supporting Canadian units we do not normally supply, such as the Artillery, there was initial confusion for example with the amount of 155 mm ammo that fits on an HLWV.

### ECHELON VEHICLE LOSSES

The echelon had 2 vehicles lost to enemy action:

1. The FAR was destroyed in April when it went approx 2" outside of the lead vehicles tracks and hit an IED in the Maywand district. The driver was returned to Canada.
2. A maintenance TLAV was destroyed by a remote controlled IED on Highway 1 in August resulting in the commander being returned to Canada.

### Summary



Sustainment, which is the continued supply of consumables, the repair or replacement of both combat losses and the non-combat attrition of equipment and personnel, is and will remain critical to success of operations, be they in Canada or deployed overseas. Sustainment must be effectively integrated with each of the other combat functions if operations are to be successful.

The Armoured DP4 Sergeant Majors course continues to be very relevant especially being conducted using recce scenarios which resemble the challenges faced daily in Afghanistan.

All members of the echelon need to be issued with a PRR radio for to maintain comms while dismounted as well as MNVG for night ops. All trucks need to have mounted radios as opposed to relying on manpacks.

Integral force protection was adequate however the fact that the TLAV RWS was not stabilized limited the echelon both in observation and firepower on the move. This could be rectified by having not just the SSM but the Maintenance Warrant as well in LAV 3 or Coyote. It is crucial that members of the echelon have a useful secondary qualification that allows them to be utilized in different roles as the requirement for maximum flexibility is still the norm.

The sustainment TTP's and doctrine remain valid and relevant in operations in Afghanistan. However, as the situation on the ground with respect to operations and "The Threat" continues to evolve, so to will the manner in which the Tank Squadron Echelon provides support.

#### Sources Consulted and Quoted

B-GL-300-004-FP-001, *Sustainment*

B-GL-300-001/FP-000 *Conduct of Land Operation*



## **Heavy Armour in Afghanistan an Infantry BG Commander's Perspective**

**By Col O.H. Lavoie, MSC, CD**



1 RCR BG Comd, LCol Omer Lavoie discussing combat team axes of advance with Maj Trevor Cadieu, OC B Sqn, LdSH(RC) south of Howz-e-Madad, during OP BAAZ-TSUKA (clear proof that cavalry officers can dismount!). (Photo By: Sgt Dennis Scoink, Dutch Army, RC(S) PIO Image Tech)

As an infantry officer, I was both surprised and enthusiastic to be asked to contribute to ARMOUR BULLETIN to provide my perspective on the use of tanks as Commanding Officer of 1 RCR BG, during OP ARCHER ROTO 2. First, though, I will provide a bit of background. The initial TO&E of the 1 RCR BG, of about 1000 soldiers did not include any heavy armour. As such, when 1 RCR BG deployed to Khandahar in Aug 2006, it was without a tank squadron or an armour engineer troop. It is significant that I refer to both tanks and heavy armour engineer vehicles in this paper, as they provided a similar and complimentary capability which I deemed to be most critical: armoured breach and mobility support.

Within literally hours of transferring command authority to 1 RCR BG, the planning for OPERATION MEDUSA, NATO's first-ever ground offensive operation commenced. 1 RCR BG was assigned to defeat a concentrated, prepared enemy defensive network within the districts of PANJWAI and ZAHRE. It is from this operation that the clear requirement for heavy armour in Afghanistan was born.

OK, lets christen the ground. The area assigned to 1 RCR BG was complex terrain, rural in nature and characterized by typical Afghan mud-wall compounds connected by an austere, one vehicle road network surrounded by grape fields and cannabis fields. The roads were heavily laden with Improvised Explosive Devices (IED) in anticipation of Coalition Forces, using these roads to facilitate an offensive operation. The grape fields consist of metre-high mud furrows that are spaced about 2 metres apart and dried over decades to the consistency of concrete. These fields were area obstacles to all vehicles, tracked or wheeled. Scattered throughout the area were mud grape-drying huts, some as big as 50x25 metres, with metre-thick walls that again were the consistency of concrete. Both the walls of grape-drying huts, the grape-field furrows and compounds provided the enemy with very good protection from small arms fire and 25 mm cannon fire, at least from the 25 mm High Explosive Incendiary (HEI) counter-personnel rounds. As such, the enemy prepared his defence in depth, anchored to these compounds



with an interconnected system of communication trenches provided through irrigation canals. The irrigation canals similarly and typically were linear obstacles, similar to anti-tank ditches to most if not all vehicles.

It was this combination of obstacles protecting the enemy's defensive positions that posed the greatest challenge in planning the attack. It was clear from the onset that the actual attack and fighting by the infantry, supported closely by combat sappers (to provide explosive breach and clearing) would have to be dismounted, including the approach to the objectives. But the real dilemma was in determining how to get the LAV III vehicles forward and up onto objectives in order to support the dismounted infantry with very valuable cannon fire. In the end, it was through the use of engineer dozers, (often with improvised armour added on to provide some protection) that breaches and combat roads were created under contact after an objective was taken in order to get LAVs forward. It was a slow and risky task, but one that the Taliban did not anticipate and as such was successful. From this experience however, the requirement for tanks and armour engineering vehicles was identified. And, with really what is lightning speed, an Armoured Engineer Troop (37) from 1 CER and a tank squadron, B Sqn, LdSH was generated and arrived into theatre in October 06. A very welcomed addition the 1 RCR BG, and historically notable as the first Canadian tanks to serve in combat since Korea. Equally as notable was the last time that The RCR was supported by tanks in combat; it was in Korea, also with the LdSH (RC).

So what do tanks provide to an infantry BG, in what is considered a Counter-Insurgency (COIN) operation? The answer may not be as clear as intuition would lead us to assume. Clearly, tanks support in OP MEDUSA would have greatly sped up the operation. The concept of operations and/or scheme of manoeuvre may not have changed but speed of execution would have. And this speed of execution is chiefly related to armour's ability to conduct mobility support through obstacle breach in complex terrain. Non-doctrinally, but very fortunately, each troop of tanks was equipped with one dozer tank and one plough tank. It was with these blades/ploughs that grape fields could be breached, mud compound walls could be pushed through or pulled down (with the arm of the AEV or tank dozer blade), and canals could be filled in, to provide crossing sites.

As soon as the armour arrived in theatre and was *allowed* (more on that later) to leave Khandahar Airfield, rehearsals were conducted to test the ability of tanks/AEVs to breach the various obstacles in concert with providing mobility corridors for LAVs to support dismounted infantry. The rehearsals were highly successful. As such, the BG was now afforded a significantly greater degree of freedom of movement and action. There was virtually no area in Zarhe/Panjwai/Maywand districts that tanks supported by infantry or vice-versa could not manoeuvre. From my perspective, this was the greatest capability that the tanks brought to theatre. However, and in addition, as a BG Comd, I now had a 5<sup>th</sup> manoeuvre sub-unit, the ability to create 3 combat teams and a formidable amount of combat power, by way of the 105mm guns on the Leopards.

The tank guns saw action virtually within hours of being forward deployed and clearly contributed to killing a significant number of enemy. The enemy feared but understood the range and limitations of the 25 mm cannon. However the enemy's "lessons learned" cell was fairly slow in learning the range and power of the 105 mm tank gun and in particular 105 mm HESH. Grape-drying huts and compounds no longer served as safe defensive positions and 105 mm HESH easily penetrated and killed enemy within these structures. Similarly, enemy mortar and rocket crews, believing they were at sufficient standoff range, were engaged and destroyed from tanks in sniping positions. But in particular, the tank provided a unique capability in a COIN environment—precision.

It was alluded earlier, that there was significant reluctance by our higher formation (Regional Command South), to allow the tanks to go forward. The standing joke between myself and Maj Cadieu, OC B Sqn, was that the squadron's toughest fight will be breaching the front gate of our base. However, eventually, the tanks got into the fight. That same reluctance however was still evident whenever our plan in an operation (which was always!) included armour. The fear from higher HQ was collateral damage. In reality however, the use of the tank in support of COIN was often the best guarantee to prevent an operation from going "kinetic".

OPERATION BAAZ TSUKA was B Sqn's first operation. Ironically, it was an op designed to be fairly non-kinetic with an aim of separating "tier 1", (i.e. hardcore) from "tier 2" (local fighters) enemy command and control. And there was much resistance to the use of tanks. But the BG argument was that, based on experience from MEDUSA, if the enemy thought they had a chance, they would often "try you on" and an enemy contact would ensue. But as we proved, 60 tons of armour and 105mm of HESH, was usually enough to convince the enemy not to bring an "AK 47 to a tank fight". And it often worked. And when it didn't, the enemy paid for it. During OP BAAZ TSUKA, there was tangible evidence from various sources that the tanks "dissuaded" the enemy from attacking. This in turn prevented the enemy from shaping the operation into an insurgent information victory through friendly forces causing collateral damage in built up areas in response to enemy contact. The enemy was simply overmatched in terms of the protection provided by the armour and the firepower of the tank gun.

The tank gun guaranteed precise engagement, unlike artillery, so actually reduced collateral damage. It was argued that if a contact ensued in a built up area, it would be much more prudent to fire a few HESH rounds into a specific building or compound as opposed to calling in an artillery fire mission which had a larger weapons effects footprint. This is another important capability that tanks bring to the COIN battle space when it is necessary to engage the enemy discriminately in areas where there are non-combatants living.



The arrival of both B Sqn, LdSH (RC) and 37 Troop, 1 CER into theatre with both tanks and AEVs exponentially increased the combat power of the 1 RCR BG. Equally as important, it significantly influenced the BG's ability to operate across the Contemporary Operating Environment's full spectrum within a COIN context. This allowed the BG to choose *when and where* to engage the enemy in both combat and information operations. There should be no doubt that these capabilities saved Canadian soldiers' lives and equally as important killed significant numbers of enemy.





## **Tank-Infantry Cooperation in Complex Terrain**

**By Capt P. Croteau, CD**

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**Capt Pascal Croteau served as Troop Leader for 2 Tp C Sqn LdSH(RC) on Op ATHENA Roto 4. He is currently posted to the Armour School as Directing Staff.**

### BACKGROUND

It is the complexity of the Zhari-Panjwai region of Afghanistan that makes this war primarily an infantry war. With its many compounds, its walls as high as towers, its narrow roads and marijuana fields, the role of tanks could have been limited to supporting convoys or taking up blocking positions on heights. Nevertheless, since our arrival in theatre, we have developed standard operating procedures (SOPs) and ways of doing things which have demonstrated their effectiveness during operations in the summer and fall of 2007. Using the long defile doctrine, the members of the battle group (BG) have developed excellent tactics, the execution of which varies from one operation to the next. Troop 32, to which I belong, has taken part in more than six planned operations and every time we have used the long defile technique, which we call here the Road Clearance Package (RCP), and every time we have been able to advance safely toward the objectives while clearing the roads of improvised explosive devices (IEDs), thereby reducing the risk of rolling over explosive devices. The fact remains, however, that while these SOPs reduce the risks, they do not eliminate them entirely: straying from the path by just a few inches can prove fatal. Members of the companies (coys) and the squadron (sqn) have learned this lesson to their cost, as several vehicles have hit mines, even after the rollers and the Engineers have passed. This paper is based primarily on the experience of my troop, but also draws on that of all members of C Sqn.

### AIM

The aim of this article is to show how tanks can play a role in the equation and have an impact in complex terrain, and how we have attempted to address the range of challenges that we have encountered. After two months of operations, we have compiled a number of observations, which will nonetheless come as a surprise to no one.

### MOVEMENT

The movement of tanks instantly prompts a reaction from the insurgents. Since we cannot conceal our movements, the insurgents know exactly where the combat teams will strike and actively anticipate the final destination of our convoys. Since their advance warning network is quite effective, we had to find a way to cover our tracks: this is why tanks have been used on





several occasions as a diversion, as part of a deception plan or as bait. We carried out an operation with B Coy in October, which was a textbook example of success in this area. The following details are taken from my war diary:

*"The plan divides the combat team into two groups, the first dismounted and the second mechanized, in order to clear the road. Two platoons (pls) plus the coy command post (CP) will set off on foot from the forward base during the night of \_ October in order to take up observation and killing positions along the north-south axis of X Road, located less than \_ km from the forward base. Once in position, with observation established of the choke points and the compounds, the mechanized group will set off from the forward base at around 0600 hrs and will establish a leaguer just north of R Road at the intersection with X. The dismounted pls will then observe the advance warning network and the response of the Taliban in the area. Whenever the tanks move, the mere fact thereof automatically raises the insurgents' alert level and they begin to react to our movements. Once in leaguer formation, the Tp WO will install his rollers and the mechanized group will move south on X in the normal sequence of an RCP. A light armoured vehicle (LAV III) normally brings up the rear behind the last two tanks. The aim of the operation is to disrupt the insurgents, observe their advance warning network and the speed with which they can organize. The RCP will be merely a diversion, as we believe that the Taliban will think that we are clearing the road in preparation for establishing a police sub-station (PSS) or a checkpoint at intersection X and Y. As the RCP moves south, the dismounted elements will take steps to neutralize the enemy in order to really take them by surprise."*

*"Wake-up was at 0415 hrs in order to be ready to leave at 0600 hrs. The tank commanders came to the coy CP to receive a briefing on the status of the pls that had set off on foot the previous evening. Everything had gone off as planned and the pls were in an observation position ready for Phase II of the operation. We left the forward base at the scheduled time and established our leaguer as planned. The Tp WO installed his rollers and 40 minutes later we were ready to begin our RCP task. At 0730 hrs, the pl that was positioned farthest south began sending reports about enemy activity and the possible deployment of a dozen insurgents 300 m west of X Road. We believed that the Taliban concealed in the south had been warned of our approach and had accordingly attempted to set up mini-ambushes to catch us as they had done during the clearing of a road with C Coy. One thing was clear at that point: they had taken the bait and fallen into the trap that the combat team had set for them. They had no idea that they were being observed by infantry and were convinced that the RCP was moving south in order to secure the road and possibly establish a checkpoint. At around 0815 hrs, when a presumed Taliban commander (Comd) was standing up issuing his orders to his troops, who were hidden by vines, the South Pl Comd gave the order to his pl sniper to shoot at the individual. The Taliban leader was killed without his troops knowing where the shot came from, because the sniper rifle was equipped with a silencer. A few seconds after the shot, the pl began to engage the insurgents with their pl weapons (C6, C9, C7, M203, M72) and called down a highly effective artillery fire mission on top of them. The Taliban responded with their light weapons and RPGs. The tactical unmanned aerial vehicle (TUAV) reported that a group of insurgents were withdrawing to a compound farther West and by the time the artillery had opened fire on their position, they had time to launch additional RPG rounds onto the pl position. One soldier was wounded when an RPG hit the wall of the grape hut from which he was firing. The Section Comd had some difficulty finding the soldier amid the dust, but finally found the casualty, who was quite dazed. The procedures for extracting the individual northwards were then begun and the Company Sergeant-Major (CSM) took charge of the casualty, who continued northwards, where the ambulance was waiting for him. The same pl was then engaged from the south and the Coy Comd decided that the objective of disturbing the enemy had been more than achieved, and decided to begin the withdrawal northwards. It was all over by 1000 hrs and we were back at the forward base around 1115 hrs. During the troops in contact (TIC), the RCP was in a defensive position on the road some 1.5 km to the north and we were assigned to cover the withdrawal of the dismounted elements. Intelligence reported that some 15 Taliban had been killed in the operation. The fish took the bait and we really shook them up."*

This use of tanks clearly showed that we can not only protect the infantry and take part in direct actions, but also function as a diversion or as bait. If used properly, our SOPs and our routines can be employed to confuse and destabilize the enemy. This operation was a fine example of unconventional cooperation between tanks and infantry, since the plan called for the tanks to pass through a tunnel of infantry and not the reverse, as we are accustomed to doing. Without the presence of this tunnel, it would have been virtually impossible for us to move along X Road without the risk of coming under fire at very close range or even from buildings. Furthermore, our positioning of vehicles in the RCP made it easy for us to escort the ambulance to the casualty collection point, since it was no longer in the rear echelon, as in the past, but with the lead troops (generally the twelfth vehicle). Thus, realizing that the movement of tanks was becoming a weakness because of the warning networks, the BG Comd decided to bring the tanks out more often and not only in kinetic operations. We may not be able to hide the movement, but at least we can hide our intentions.

#### Single File Formation

Another finding is that most mechanized movements must be carried out in single file and not in extended line in order to reduce the risk of hitting a mine or IED. The point is not that the tanks are reduced to this formation, since during these initial months, we have undertaken blocking, occupation, clearing, feint and destroy missions, which have required us to adopt several types of formation. Nevertheless, the terrain toward the objectives is generally very canalizing and is very risky for tanks on their own, as it requires line formation. Every movement must be carried out with dismounted engineers and infantry. Generally, a single troop of tanks is attached to the coy with an armoured recovery vehicle (ARV) and a truck to carry the rollers. In the event the cbt



team is commanded by the Armd Major, an infantry pl will be attached to carry out the task. The cbt teams have the ability to break out across country and choose their routes; that, however, requires a planned procedure, which is extremely costly in financial terms, since the Coalition reimburses the farmers for the damage caused by breaching. Furthermore, this method is enormously counterproductive in terms of reconstruction and the moral victory amongst the local population, who turn against us once their fields have been ravaged by our mine ploughs and Badger AEVs. The BG Comd, aware of the three-block war concept, accordingly ordered that all operations were to be carried out with minimum collateral and material damage, so that the local population would trust us and return to their homes as soon as possible. The tanks are accordingly confined to a single axis: this limits both their movement and the element of surprise and makes them more vulnerable to direct and indirect fire. It was therefore necessary to find a way of distributing the tanks and the forces in order to counter-balance our loss of mobility and the lack of an element of surprise.

We therefore balanced our formation and increased our flexibility. The battle RCP consists of a tank troop, a Badger, an inf pl, a combat engineer section and sometimes the infantry battle captain or Cbt Team Comd. The order of march of the vehicles behind the dismounted infantry is one tank with rollers or a plough in the lead, followed by a Badger, which ploughs the road and covers the space between the rollers, followed by the engineer section vehicle and the K9 (dog) team, an infantry section LAV, the troop comd's tank followed by the LAV belonging to the Cbt Team Comd and the rest of the RCP. The troop's tanks are accordingly dispersed throughout the cbt team. We always make sure that we have one infantry or engineer section behind each tank and, contrary to our doctrine, the ambulance and the ARV are practically in the lead so that they can respond more quickly in the event of breakdowns or casualties. If the tank with the plough is not used forward, it will precede the ARV and the ambulance, and will be able to make a road beside the column of vehicles and move forward more quickly. The echelon follows two or three km behind, under the control of the Squadron Sergeant-Major (SSM) or the Coy Second-in-command (2I/C). The RCP used for non-kinetic operations (clearing a road for resupply) uses the same formation, with the addition of the newly-purchased engineer vehicles, such as the Buffalo, Husky and Cougar (commonly known as the EROC suite) and involves only the RCP, the escort and the vehicles of the echelon. Non-kinetic RCP is a tp or pl task and is accordingly commanded by one or the other, depending on the organization to which the task is assigned.

More specifically, the advance occurs as follows. In closed terrain, two infantry sections are positioned on either side of the road, at the head of the column, some 75 m from the first tank, advancing on the flanks. Behind them, the roller tank clears the road, followed by the Badger. The two vehicles are followed by a dismounted engineer section on the road in an inverted "V" formation. Maintaining the distance between the dismounted personnel and the lead tank is crucial so that no one is wounded by shrapnel in the event of an explosion. Initially, we placed the engineer section on the flanks of the tank and, when the tank rolled over a mine in September, the explosion injured three people on the ground. Here, trial and error has consequences and we must be constantly analyzing and re-thinking how we do things. The engineers focus on the indicators that can reveal an IED or a mine, while the infantry makes sure that no triggerman, wires or Taliban are hiding in buildings, behind walls or behind marijuana plants. The RCP itself has a front 200-250 m wide by 500 m long. The RCP is commanded by the Tank Troop Leader, the Infantry Platoon Comd or the Sapper Troop Comd. In case of doubt or if obstacles are encountered, the lead tank stops and launches into the famous Warning, Security, Recce, Plan and gives a description of the obstacle or suspicious location. The engineers then move forward and take care of the obstacle or the IED. In the event of contact, the dismounted troops respond with fire, withdraw behind the tank, and the pls begin the counterattack and dismounted manoeuvres under covering fire from the artillery and the tanks. Since we already have people on the ground and the force is well distributed, we are able to locate the enemy quickly and eliminate the threat with fire from the tanks, artillery and air assets. The tank remains the weapon of choice by virtue of its speed of action and its target acquisition capability. The gunners seek and find the insurgents very quickly. After a number of operations, cooperation between the elements is excellent and everything proceeds smoothly. Everyone knows his/her job and his/her place in the RCP and the cbt team. When the engineers go to work, the tankers keep quiet and follow, but the moment we come into contact is the one where the tanks and infantry take the floor. A cbt team operation requires good knowledge of one's role and the humility to let others take over when the situation so requires.

#### Protected Obstacles

Third finding. The majority of the obstacles on the routes are under observation or under enemy fire. Frequently, obstacles usually consisting of wood, stone or old barbed wire are intended to slow us down and to make us deploy our dismounted troops. Thus, when we execute our drills, it gives enemy combatants more time to position themselves farther on along the axis of advance and ambush us. They also use places that are fairly easy to discover and obvious to the lead troops. Generally, well-hidden IEDs are positioned at the site of the main ambush, while readily noticeable obstacles are positioned so as to enable the enemy to gain time. Sometimes, they will fire at us and take off toward a pre-determined position that is better protected where they will launch their main attack. Since they are familiar with our rules of engagement, they know that if they are unarmed and if we have no ANA soldiers with us, there is little danger of their being killed or captured. Since force protection is our priority, they also know that a single burst of small arms fire can immobilize a cbt team for several minutes and thereby give them more time. We accordingly had to find a way of maintaining a good tempo, protecting the troops and effecting a multitude of small breaches of obstacles while under small arms fire. The disposition of vehicles in our RCP, good battle preparation (tank commanders, section commanders and sappers talking to each other after the orders group), effective execution of drills and the use of UAVs as a warning have provided a partial solution to our limitations, but there nonetheless remains some risk whenever dismounted people are advancing toward an obstacle or a tank turns round the corner of a wall. It was also necessary to slightly vary our sequences and procedures for breaches. Nevertheless, a tank (rollers or plough) and a Badger (or the dozer blade tank



which has now been installed on the troop commander's tank since the arrival of the Leopard 2) are always used first in the order of march behind the infantry in order to clear the road and with a TIC, the tank is automatically used as a mobile bunker for the dismounted personnel. After several joint operations, the infantry and engineers have often noted that they found the presence of the tanks reassuring and that when we were close to them, the enemy was more hesitant to launch its ambushes. The team is therefore more confident and projects a professionalism and a confidence that may discourage certain Taliban<sup>1</sup> from attacking us.

#### Limitation of our Range

Fourth finding. When channelled in defiles and surrounded by 10-ft-high walls or marijuana fields, the tanks lose their ability to fire at a distance and to move the turret. Just sweeping arcs of fire without destroying all the walls is the greatest challenge for the crews. We often simply use the Stab Elevation Override to allow the gunner to observe, but generally speaking, the Stab remains off and the tank commander aims the gun between the walls and the dwellings. We have noted that sweeping the arcs, even if the gunner can see nothing, frightens the insurgents and discourages them from firing on us. In some areas, the tanks are used more like bunkers for the dismounted troops than for their firepower. Nevertheless, in the event of TICs, we do not hesitate to make room and expand our arcs of fire. In order to address the risks caused by lack of space, the crews have mounted their C8s on the turret (one pointing forward and one pointing backwards), with the tank commander's 9-mm on the hatch and they have two hand grenades ready for throwing. In spite of everything, the best defence for the tanks in closed terrain remains the presence of infantry on the ground and a LAV III behind them.

For the troop, most of our engagements have been at distances of between 75 and 600m. We have had some engagements at over 1000m, but they occurred while the tanks were in run-up position at the Forward Observation Base (FOB) or when we were observing Taliban who were not involved directly in an attack on us and who did not even know that we were there. However, when we advance along a complex axis, the Taliban hide at between 75 and 300 m and most of the time fire at us before we are able to observe them. We can see them because of the smoke or flash from their weapons. They observe our guns and wait until we aim them in another direction to fire. The advent of the Leopard 2 and its independent periscope will greatly enhance our detection capability and reduce the number of hits on the tank. We are also impatiently awaiting the arrival of the "Canister,"<sup>2</sup> which will discourage any attempt to hit us on the flanks at close range. Sometimes they launch a rocket from between two marijuana plants and disappear. With a Canister round, we will be able to respond by firing in the direction from which the round came and kill or wound the hidden RPG crew. The 120-mm HEAT rounds have produced excellent results comparable to the 105-mm HESH round. The intensity of the shot from a Leopard 2 is a very important aspect of cooperation between ground troops and tanks. With the new tank, we constantly have to check our 45 before firing, and the rule about the second road wheel no longer applies. Dismounted personnel must be behind the tank, otherwise they will be hit by the concussion. Thus, the mixed use of tanks and infantry is the key to success in compensating for the limitations of our vision and our range in complex terrain. The advent of the Leopard 2 and its outstanding observation capability, in addition to the reduced exposure of the tank commander to enemy fire by virtue of his/her periscope and the view from his/her episcopes will increase our target acquisition capability and will enhance our ability to fire first instead of merely responding.

#### Vehicle Recovery

One example of cooperation between infantry and tanks is undoubtedly vehicle recovery. Loss of mobility inevitably entails a risk of ambush and direct attack, as the combatants' attention is focussed on the vehicle and no longer on seeking out the enemy. The LAV IIIs frequently break down or are caught in the wadis, and the advent of the tanks has vastly reduced the recovery time and the risk of ambush. The tanks and ARVs are capable of extricating a vehicle swiftly and effortlessly. The same is true when a vehicle hits an IED or when we are caught in an ambush; the more we reduce the time spent in the killing zone, the less we expose vulnerable troops. The tanks are able to push, pull and hitch very quickly, in addition to offering significant metal protection around ground troops engaged in repairs or in installing towing cables.

#### Tank-Infantry Cooperation

To give you an idea of how an operation unfolds in complex terrain, here is another excerpt from my war diary following OP SARDIQ SARBAZ in the Panjwai area in September: *"After a fairly quiet hour, the lead tank, the first in the RCP with its plough, came into contact when it was engaged with small arms and RPG fire. At virtually the same moment, the Coy Comd's LAV III hit a mine just behind the tp leader, who had just noticed a small red flag (marker) hung on a tree 100 m north of the road and who was attempting to pass on the information by radio. There was a cloud of dust and the sound of bursting tires all around. After the dust had settled, the tp leader feared the worst when he saw the LAV III at a 45-degree angle on the road, with three wheels missing. No one was seriously injured, although the crater was quite deep. The tp leader then asked his loader to take a look at the vehicle and suggest that we get it out of there and move it forward toward our final destination. After some discussion, the LAV III was hitched and pulled 300 m so it could be parked off the road. Everything was done very quickly, as we were still in contact at the front of the convoy and we could hear the bullets whistling above our heads. The road was very narrow and*

<sup>1</sup> Contrary to what appears in the media, the Taliban are not all suicidal and virtually always look for an escape route when they launch an ambush. The presence of a balanced team, with both tanks and infantry, has a major psychological impact and undoubtedly contributes to reducing the number of attacks.

<sup>2</sup> Shell consisting of many small pellets, the effect of which is similar to that of a 12 gauge.



*surrounded by fields of vines and marijuana plants (10 ft high) with earthen walls at least 12 ft high in places. In short, it was the ideal place to ambush us and to limit the range of our weapons. The tp leader's tank knocked down a wall on its left to increase its vision and be able to respond to fire from that side. This was, however, to no avail, as the Taliban had disappeared. Once the situation had returned to normal, the lead tank reported on the radio a second barbed wire obstacle across the road located in a blind corner. The engineers then moved forward to check whether the obstacle was mined, at which point they came under small arms fire. They withdrew behind the tank, which advanced toward the corner of the wall to protect them. At that point, it was hit full on the front of the turret by an RPG 7, fired by a group of gunners less than 200 m from the tank. The shrapnel shattered the gunner's main sight, but did not injure any of the crew. It engaged the Taliban with its secondary sight and killed one of them with a 105-mm HESH round. Once the situation had settled down, the convoy resumed its advance toward the objective. It was around 1200 hrs when the advance resumed."*

*"700 m outside the village, the RCP again fell into an ambush from the south. The lead tank began to fire, as did the engineers and the ANA soldiers, who had just been deployed forward a few minutes previously. They began a flanking manoeuvre on the left under cover of the lead tank and the LAV III of a pl. At this point, the Forward Observation Officer (FOO) mentioned that we had just obtained support from an F-16, which flew a pass and fired with its 20-mm canon. It took a tank firing a smoke shell into the grape-drying hut for the pilot to finally attack the enemy position. Believing that he could be more useful forward, the tp leader positioned his tank in order to cover the entrance and the entire northern section of the village, while everyone concentrated on the attack south of the road. At that point his gunner noticed a head behind a wall in the village. The Capt confirmed the presence of the individual by observing from beside the tank commander, and they noticed that the individual had an RPG on his shoulder. He raised his head to confirm that no one was in the danger area of the gun and gave the order to fire. The RPG gunner fired at the same moment and missed the tank, while the 105-mm round hit the target, creating a cloud of dust. After a second round, there was no further movement on the position and the contact with the enemy to the south was terminated. Everything happened so quickly; the troopers responded efficiently and accurately to the orders."*

#### Summary

In summary, after three months of operations, the members of the cbt teams on the ground have reached a number of conclusions, namely that the movement of tanks cannot be concealed, that we must virtually always use single file formation, that the obstacles on the routes are under observation or fire, that our range is severely limited by the natural obstacles on the ground and that the tanks have reduced the risks associated with vehicle recovery procedures. During these initial months of the mission, we have used and adapted our tactics to the reality of the situation and have successfully reduced our limitations.

#### Conclusion

In conclusion, we can certainly say that no one in Roto 4 has reinvented the wheel. We have merely used the drills we learned, modifying them slightly to reflect the enemy threat and the reality of the highly complex terrain of Zhari-Panjwai. In observing the enemy reactions and their ways of confronting our tanks, we have come to use the tanks for a wide range of tasks in order to limit their knowledge of our intentions. In this context, the tanks and dismounted troops have found their role and the successes gained in operations are necessarily related to this mutual understanding. Over the past three months, immense respect has developed between the various occupations and we are all ready to risk our lives for one another. We have seen tanks barrel onto mined obstacles to support engineers, infanteers entering compounds to make sure that the tanks would not be hit from the flanks and engineers crawling out in the open to secure a culvert. These everyday actions make us realize the power and purpose of the cbt team.



Phot courtesy Capt Pascal Croteau



## Canadian Armour in Afghanistan

By Major T.J. Cadieu, CD

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### INTRODUCTION

By deploying tanks and armoured engineers to Afghanistan in October 2006 and supporting the acquisition of the Leopard 2, the leadership of the Canadian Forces (CF) has acknowledged the importance of maintaining heavy armour in a balanced force. While the continued development of sensors and technology will be extremely important to achieving improved situational awareness on the battlefield, the hard-earned experiences of the Canadian Army and our allies in sustained combat in Afghanistan and Iraq have proven we must be prepared to get our hands dirty and come into physical contact with the enemy if we wish to define his strength, composition and intentions, and subsequently kill him. Canadian tanks and armoured engineers have better protected our dismounted infantry soldiers in Southern Afghanistan, allowing them to close with and destroy a fanatical and determined enemy in extremely complex terrain.

This article will review tactical lessons learned of Canadian armour in Afghanistan since October 2006, provide a candid assessment of the challenges faced by tankers in this counterinsurgency (COIN) environment, and consider the introduction of the Leopard 2. Nowhere in this editorial is it implied that Canadian armour is the predominate arm, or that it should be reinvigorated at the expense of other battlefield enablers. On the contrary, our recent experience in combat has provided irrefutable evidence that all elements of the combined arms team remain fundamental to the delivery of decisive combat power in the COE, and that our efforts in training and operations should reinforce this grouping.

### BACKGROUND

After fighting a protracted counter-insurgency battle across Southern Afghanistan, 1st Battalion Princess Patricia's Canadian Light Infantry Battle Group (1 PPCLI BG) was confronted in the spring of 2006 with a significant increase in insurgent activity in the Panjwayi and Zhari Districts of Kandahar Province. Although the Canadian BG working closely with the Afghan National Army (ANA) was able to disrupt the enemy in a series of BG-level operations culminating in Operation Zahar (as part of Operation Mountain Thrust), Taliban forces quickly re-asserted their presence in the region once hostilities had ended. The International Security Assistance Force (ISAF) could not ignore the threat posed by this massing of insurgents on the doorstep of Kandahar City, the coalition centre of gravity in the south of Afghanistan. A significant information operations victory would be awarded to the Taliban if they could not be dislodged from these areas, and the ability of ISAF to achieve its stated mission of reconstruction would be virtually impossible to achieve without the confidence and support of the local populace. Within weeks of arriving in theatre in August 2006, the 1st Battalion The Royal Canadian Regiment (1 RCR) BG was tasked to clear the Taliban from Panjwayi and Zhari Districts in Operation MEDUSA, the largest combat action undertaken to date by the North Atlantic Treaty Organization (NATO).



Rather than adhering to small unit attacks and ambushes, and retreating in the face of direct confrontation with NATO forces, the Taliban chose to make a conventional stand at Pashmul. They occupied well dug-in defensive positions amongst densely packed grape and poppy fields and they covered with direct fire and improvised explosive devices (IEDs) all ingress routes suitable for wheeled vehicles. The BG Commanding Officer (CO), Lieutenant Colonel Omer Lavoie, realized quickly that restoring tactical battlefield mobility would be essential to dislodging the enemy from this complex terrain. Without armour at his disposal, he introduced civilian-pattern tracked dozers to the fight in order to slice through grape fields and allow dismounted infantry soldiers to get 'up close and personal' with the insurgents. The tactic was extremely effective. Advancing under the cover of heavy artillery and aerial bombardment, the dozers allowed the BG to seize key terrain and facilitate the systematic clearance by dismounted soldiers of all compounds and infrastructure. By 13 September 2006, Taliban forces operating in Pashmul and Zhari had capitulated. Hundreds of insurgents had been killed and many others were forced to flee to the west. While two successive infantry-heavy Canadian BGs conducted successful counterinsurgency operations for nearly nine months without integral armour, the lessons of Operation MEDUSA reinforced the importance of retaining all combat enablers in full spectrum operations. According to Lieutenant-Colonel Lavoie, "If you'd asked me five months ago, 'Do you need tanks to fight insurgents?' I would have said, 'No, you're nuts.'" He added, "Because [the Taliban] are acting conventionally, then conventional assets like tanks, armoured engineering vehicles, and armoured bridge-laying vehicles certainly have their place here."<sup>1</sup> The leadership of the CF and the Government of Canada agreed with Colonel Lavoie's assessment. At the request of Commander RC(S), Canadian Brigadier-General David Fraser, the Government announced on 15 September 2006 the imminent deployment of an enhancement package to better facilitate 'reconstruction and stabilization efforts in Afghanistan.' In addition to an infantry company designated to serve as close protection for the Provincial Reconstruction Team (PRT), the enhancement package was to include a squadron of Leopard C2 tanks from Lord Strathcona's Horse (Royal Canadians) [LdSH(RC)] and an armoured engineer troop from 1 Combat Engineer Regiment (1 CER).<sup>2</sup>

The Army generated, trained and deployed a 15-tank squadron and armoured engineer troop across the globe within six weeks of receiving a warning order. Within days of the first Leopard C2 arriving at the Kandahar Airfield (KAF) on 3 October 2006, the B Squadron Advance Party had arrived to receive equipment and parts, and establish with the leadership of the BG the tactical employment and sustainment concepts for armour in Afghanistan. The Squadron took advantage of every moment at KAF to prepare equipment for battle, and conduct training and rehearsals based on the hard-learned experiences of the 1 RCR BG in combat.

#### Canadian Armour in Counter Insurgency Operations

After deploying forward on 2 December 2006, the tank squadron and armoured engineers featured prominently in all major combat operations undertaken by the Canadian BG. B Squadron was tasked initially to establish attack-by-fire positions in support of infantry companies and form the nucleus of a BG counter-moves force capable of responding throughout the entire Canadian area of operations (AO). Many Taliban insurgents learned the hard way the capabilities of the Leopard's main gun during this period when attacking Canadian strong points with RPG and indirect fires. Leopard tank crews fired 105 mm rounds that destroyed enemy ambush parties and mortar groups that had infiltrated the Zhari District. On 19 December 2006, the Canadian BG recommenced offensive operations as part of Operation BAAZ TSUKA, a mission intended to deny the enemy sanctuary in Kandahar Province and reduce their capacity to mass for a spring offensive. Grouped with an infantry company and armoured engineer troop to form a square combat team, the tank squadron was tasked to disrupt insurgents in Howz-e-Madad and the Maywand District.

Throughout January and February 2007, B Squadron worked closely with A Company 2 PPCLI and the ANA in a series of offensive operations aimed at expanding the BG's security zone. Conducting several complex deliberate breaching and cordon and search operations in Zhari District, the ANA and Canadians demonstrated clearly their capacity and resolve to go after the Taliban at a time and place of their choosing. After securing the Siah Choy area with the ANA, the tank squadron united with American Special Operations Forces (SOF) and the Canadian Reconnaissance Squadron to dominate the Dowrey-Arghandab peninsula, keeping the enemy off balance in the region. Following the transition of command authority to 2 RCR, B Squadron remained in theatre for nearly a month conducting disruption operations along the Helmand-Kandahar provincial border and reinforcing Afghan National Security Forces (ANSF) in contact with insurgents in Howz-e-Madad and Sangsar. While sub-unit integrity was maintained for specific missions, B Squadron was tasked as a steady state to support two different operations concurrently: the squadron minus (two troops of four tanks and the squadron headquarters) usually formed a combat team with A Company, while the third tank troop was detached to another sub-unit elsewhere in the area of operations (AO). Tanks never worked independently and the value of the combined arms team was evident. The tank squadron commander led routinely during the advance and break-in phases of operations, while infantry company commanders naturally retained control of the fight through/clearance and consolidation phases. By the end of the deployment, all operations were conducted with Canadian infantry, the ANA and Afghan National Police (ANP).

A Squadron LdSH(RC) relieved B Squadron in early March 2007, in time to join Hotel Company 2 RCR BG for Operation ACHILLES, another effort on the part of ISAF to blunt the Taliban's ability to wage a spring offensive. While the bulk of fighting during this mission was left to TF Helmand and SOF, the tank squadron proved its ability to conduct sustained combat operations at great distances from the re-supply nodes at each of the forward operating bases (FOBs). In fact, the tank squadron A1 echelon, under the command of the Squadron Sergeant-Major (SSM), was called on to re-supply multiple sub-units



concurrently. In spite of initial reluctance on the part of sustainment planners to commit to the tank squadron a dedicated echelon, this organization has now become the model for integral support in the Canadian BG. Elements of the ISAF Reserve Battalion were certainly relieved to see the tanks during Operation ACHILLES, especially when the Leopard mine ploughs were used to extract several of their utility vehicles and crews that had found the hard way an old Soviet minefield.

Since May 2007, the tank squadron has fought almost constantly alongside Canadian and Afghan infantry in close combat with the Taliban. Supported by the artillery, combat engineers, attack aviation and fast air, mechanized combat teams from the 2 RCR BG have achieved decisive victories against insurgents in the Howz-e-Madad, Nalgham and Sangsar areas of Zhari District, where vineyards and imposing compounds render wheeled vehicle movement particularly difficult. Leopard tank crews have used extensively the 105 mm High Explosive Squash Head (HESH) round to eliminate insurgents attempting to attack dismounted soldiers. More importantly, tank rollers and ploughs have continued to mitigate risk to coalition soldiers by clearing routes of pressure-plate detonated IEDs, while providing intimate support and a breaching capability to dismounted infantry companies. A testament to the tremendous contribution tanks are making to counter-insurgency operations and their high demand throughout the Canadian AO, A Squadron has routinely been split into troop-sized elements or less and attached to each of the infantry companies. This decentralized employment of armour and extremely high temperatures has strained the sustainment concept and serviceability of the tanks, while dispersing the breaching assets integral to the sub-unit. The impact of this squadron has been felt as far west as the Helmand border, and north towards Ghorak and Shah Wali Kot.

### The 'Limitations' of Armour

Vulnerability to IED/ATGM Threat. Soon after the Government of Canada announced the deployment of Leopard tanks to Afghanistan, military experts rushed to criticize the decision. One such pundit, Mr. Michael D. Wallace, a political science professor at the University of British Columbia, argued in his article 'Leopard Tanks and the Deadly Dilemmas of the Canadian Mission in Afghanistan' that the "...risks of putting our 1960s-designed Leopard 1 C2 tanks in harm's way surely outweighs any additional protection they can supply to Canadian Forces in Afghanistan."<sup>3</sup> He continued that the deployment of Canadian armour was misguided as tanks are vulnerable to a variety of weapons employed by insurgents, such as anti-tank guided munitions (ATGM) and IEDs, and their quickly evolving tactics. Although Wallace was correct to say, "...even the most modern and capable tanks are vulnerable to a variety of attacks,"<sup>4</sup> he evaded the obvious fact that there is not, nor has there ever been, a system on the battlefield that is immune to enemy assault. The Leopard tank is arguably the best-protected vehicle employed currently by coalition forces in Afghanistan. It has been sent there to shield our dismounted soldiers. Recoilless rifles, ATGMs and IEDs are capable of tearing much more easily through human flesh than rolled homogenous steel, and these systems feature prominently in the arsenal of Taliban weaponry in Afghanistan. When we possess the advantage of heavy armour, it would be reckless to purposely eliminate from our inventory this key enabler and confront symmetrically an insurgency that is accustomed to fighting in the harsh terrain and conditions of Afghanistan. Specialized weapons or concentrated attack may be capable of destroying tanks, but the survival rate of their crews is high and the protection they offer to dismounted infantry from fragmentation and blast weapons is unquestionable.

Collateral Damage and Tanks. Mr. Wallace and others have also charged that collateral damage caused by Canadian tanks could turn locals against foreigners and isolate soldiers from the civilians they were sent to help. While it is true that the loss of innocent civilians and excessive damage to infrastructure from NATO military operations would impair our ability to achieve a mandate of reconstruction in Afghanistan, suggestions that the use of tanks have alienated the local populace more than other weapon systems have proven completely unfounded. Since commencing combat operations nine months ago, Canadian tanks have killed dozens of insurgents in battles throughout Kandahar Province, yet there has been no suggestion of civilian deaths attributed to tank fire during this entire period. Equipped with a fire control system that allows our soldiers to acquire and engage targets with precision and discrimination, by day and by night, the Leopard tank has in many instances reduced the requirement for aerial bombardment and indirect fire, which have proven to be blunt instruments. The deployment of armour to Afghanistan has also reinforced with the local populace the resolve of Canada and NATO to bring stability to the region, and it has sent to the Taliban a clear message that we have the tools and determination to pursue them at a time and place of our choosing. A strong case can be made that Canadian tanks have actually reduced collateral damage in the Canadian AO. We know through experience that the more combat power we commit to a mission, the less kinetic that operation is likely to become.

While every effort must be made to minimize damage to local infrastructure, there have been and will continue to be occasions when we must be prepared to use the destructive capabilities of our armoured forces to dislodge insurgents from complex terrain. While we would want nothing more than to meet the enemy in the middle of an open desert, the Taliban find sanctuary amongst dense vineyards and urban compounds. They frequently use women and children to shield themselves from coalition attack, rendering the use of close air support, aerial bombardment and artillery fire risky. To mitigate collateral damage, the tank squadron leadership includes in all operational planning a collateral damage estimate and satellite imagery is relied upon heavily by break-in forces to avoid habitable structures. Rules of engagement that protect our soldiers and innocent civilians are reviewed in orders, as is the open fire policy that delineates clearly the types of weapons to be used to engage enemy in urban terrain where a normal pattern of life has been observed. Manoeuvre damage caused by armoured vehicles to irrigation systems and croplands is remediated whenever possible by armoured engineers on exfiltration. Elements of the Kandahar PRT travel routinely with mechanized combat teams to determine the long-term needs of locals, and facilitate if required the funding and reconstruction of damaged fields and infrastructure.





Deployability. The ability of the Army to generate, train and deploy a 15-tank squadron and armoured engineer troop across the globe within six weeks of receiving a warning order does not support the notion that armour cannot be rapidly deployed. Prior to acquiring the C-17 Globemaster the CF did not possess a strategic airlift capability, and all fleets of vehicles were impacted congruently. The LAV III, for example, is not strategically deployable by C-130 Hercules. This airframe can transport one LAV III for a short distance, but certainly not from Canada to Afghanistan. Accordingly, a Canadian LAV-equipped force is moved in the same manner as a tank fleet: either by sea or leased strategic airlift. Canada's Leopard tanks were deployed to Afghanistan in October 2006 by a combination of leased Russian AN-124 Antonov and United States Air Force (USAF) C-17 Globemaster aircraft. The recent acquisition by the CF of four C-17 aircraft will enhance our ability to deploy tanks (and LAV IIIs for that matter), while reducing our current reliance on allies for heavy lift.

#### Doctrinal and Tactical Lessons Learned (and Re-learned)

The Importance of the Combined Arms Team. Although tanks provide increased firepower, protection and mobility to the BG, they are extremely vulnerable when operating independently in a COIN environment. Lacking the ability to dismount soldiers without rendering turrets inoperable, tank crews without close infantry support cannot ensure security or force protection at the scene of an IED strike, casualty evacuation, enemy ambush, or even a simple vehicle accident. What might normally be routine friction can become incapacitating or deadly when armoured forces are not capable of creating stand off between friendly and hostile forces. As important as infantry are to ensuring the security of armoured forces, so too are tanks vital to the protection of our dismounted troops. We should never plunge our dismounted soldiers into confrontation with the enemy without first taking every precaution to ensure their protection. The enemy in direct confrontation on the objective has killed very few Canadian soldiers in Afghanistan. It is on the way to the fight that our troops have been more regularly maimed and killed by mines, IEDs and fanatical suicide bombers. Tanks, with their superior armoured protection and mobility, have led as a default during all moves in both open and close terrain. We should rarely be in such a rush so as to prevent our engineers from conducting vulnerable point searches at defiles and chokepoints. The notion of grouping the different arms to benefit from their collective strengths is not new, but it has again been validated in combat.

The Debate on Grouping of Armour. While few commanders today will argue the importance of armour in the COE, there is considerable debate on how best to group and employ tanks. Should the integrity of the tank squadron be maintained to allow the BG CO to mass his direct fires and breaching assets while ensuring their sustainability, or should armoured assets be decentralized and attached to infantry platoons to ensure more vulnerable, dismounted soldiers can benefit from the capabilities of the tank in complex and urban terrain? The answer to this question lies somewhere in between the two extremes. Gone are the days we must consider the smallest tactical grouping of armour to be the squadron. Fighting through urban areas and the dense vineyards of Afghanistan requires the decentralization of forces that are difficult to control at even the lowest tactical level. Exposed routinely to intense hostile fire from unknown sources, dismounted infantry troops often lack sufficient firepower to destroy well-protected and camouflaged enemy positions. Tanks provide the punch required to breach structures, and they were deployed specifically to increase the protection of our dismounted soldiers, even if that means the division of resources.

An individual tank might provide intimate support to infantry and engineer sections while advancing in canalizing terrain, but it would be a grave error to consider this grouping a miniature-combined arms team that is sufficiently led, equipped and sustained to achieve independently the destruction of a determined and experienced insurgency. There are obvious and unassailable logistical and tactical constraints that dictate the requirement to preserve at a minimum the integrity of the tank troop. The only guarantee when employing armour in the harsh environment of Afghanistan is that tanks will break. Their timely recovery from the battlefield is dependent on the immediate availability of other armoured assets mounted on the Leopard chassis. The extraction of a tank is a troop task: one tank, or one of the two Armoured Recovery Vehicles (ARVs) in theatre, is required to tow the downed vehicle, while the remaining two tanks in the troop are required for mutual support and command and control. The tactical decisiveness of the combined arms team also diminishes when operating with anything less than a tank troop. The combat team commander is precluded from massing direct fires, and he will not have a credible breaching force if required to break into complex terrain (each tank troop is equipped with a dozer blade, plough and roller set). The division of the Squadron into more than two elements creates other problems. With only two each of the Leopard-qualified technicians (Vehicle, Weapons, Fire Control Systems and Land Communications Information Systems) in the tank squadron echelon, serviceability rates deteriorate notably when tanks are employed on multiple operations concurrently.

These observations are not hypothetical. B Squadron 1 RCR BG and A Squadron 2 RCR BG maintenance deficiencies skyrocketed when the sub unit operated in more than two locations at once. Without qualified technicians available to provide timely and responsive support to all deployed elements, proactive maintenance was neglected and vehicle serviceability suffered as a result. Of greater concern was that tanks actually became a liability to infantry soldiers when this valuable resource was too thinly spread across the BG. Tasked to support multiple operations concurrently, and struggling to maintain the serviceability of the Leopard fleet of vehicles in the heat of the Afghan summer, A Squadron was challenged throughout June 2007 to generate sufficient armour for Quick Reaction Force tasks. In one instance, A Squadron was tasked to detach to an infantry company two tanks for the reinforcement of an ANP checkpoint that had been ambushed by Taliban forces. With all mine ploughs and rollers deployed elsewhere in the AO, tank crews were forced to clear high threat routes that ANP refused to traverse by simply driving over them. The importance of maintaining troop integrity was reinforced further when one of the tanks became trapped in a deep wadi system. While attempting to extract the jammed Leopard, the second tank became incapacitated, requiring the infantry company to wait as last light approached for the deployment from a FOB of additional



recovery assets. Although the combat team was able to chalk this experience up as a 'near miss', the incident demonstrated clearly the risks of splitting armour.

Command and Control. Proponents of the piecemeal employment of armour might also be inclined to relegate tank squadron commanders to the role of support arms advisor to the CO, as they would not have troops to command. This would be a mistake. Since tanks first joined the Canadian BG in combat in December 2006, infantry company commanders acting in the capacity of combat team commander have left routinely the advance and break-in phases of combat operations under the control of the tank squadron commander. It is imperative that a leader who understands the intricacies of the tank implements and breaching in complex terrain control that part of the fight. Combat arms officers understand manoeuvre and are trained early in their careers to appreciate the collective strengths of the combined arms team. While either the tank squadron commander or infantry company commander will lead the combat team, assigned tasks or terrain might dictate that tactical control rotate several times in the execution of an operation.

Sustainment. Tanks, regardless of their vintage, are extremely maintenance intensive and they possess an insatiable appetite for combat supplies and commodities. Recognizing the sustainment demands of the Leopard fleet of vehicles, the National Support Element (NSE) deployed to Afghanistan has allocated to the tank squadron a dedicated echelon. Commanded by the SSM, the tank squadron echelon is equipped with fuel, ammunition and commodities trucks, mobile recovery teams, recovery vehicles and a wheeled ambulance. 105 mm ammunition is frequently transported from KAF to manoeuvre elements via medium lift aviation, while other combat supplies are moved by road with Combat Logistics Patrols. The tank SSM assumes responsibility for all combat supplies at the FOBs, and he deploys forward with Leopard qualified technicians as required to conduct routine and emergency replenishment of the squadron. Recovery and medical vehicles always travel with the combat team to ensure their immediate responsiveness to the needs of the soldiers. The echelon system has worked extremely well for the armoured corps for decades, and it continues to in combat today.

None of the other arms have been allocated a dedicated echelon in Afghanistan. Without integral maintenance resources, infantry companies have been incapable of conducting proactive repairs requiring technical support to the LAV fleet of vehicles. Cognizant of the sustainment challenges confronting each of the infantry companies and other elements of the combined arms team, both the TF 3-06 and TF 1-07 tank squadrons sustained multiple sub-units over a continuum (up to four concurrently) without an increase in resources or qualified technicians. In the interests of training as we fight, building cohesive teams, and addressing the intense sustainment demands of combat operations, the Chief of the Land Staff has directed that integral echelons should be allocated to every sub unit in the BG, including the artillery battery and composite engineer squadron. It does not matter who technically owns the resources, whether it is the NSE or the sub unit being supported. Sub units just need to know they will have continuous and uninterrupted integral support, without exception.

While armoured crewmen have traditionally filled driving and leadership positions in the tank squadron echelon, the NSE has directed they be replaced by truckers. The rationale for employing tankers in the echelon has only been reinforced in combat. As Leopard qualified soldiers, the crewmen serving in the echelon are the only redundancy integral to the tank squadron deployed. Tankers are trained to work in an armoured squadron and they understand implicitly the support demands and tactical employment of this organization. While conducting emergency re-supply operations in December 2006, armoured crewmen in the echelon were able to break down and distribute different natures of 105 mm ammunition quickly, they assisted in emergency tank maintenance, and they were able to forecast in advance the specific POL requirements of the Leopard fleet of vehicles. While the truckers serve an extremely important role in the sustainment concept of the BG, they simply do not have a congruent understanding of tank-specific requirements.

Training. While coalition soldiers will as a default confront traditional 'hit and run' insurgency tactics in Afghanistan, it is not inconceivable that the enemy might again mass and take a conventional stand against ISAF, as they did in Pashmul in September 2006. Pre-deployment training must therefore be progressive and prepare the BG to conduct both COIN and conventional combat operations, from the troop-platoon to the BG level. Individual training should focus on the perfection of basic soldiering skills to include physical fitness, marksmanship, combat casualty care, and trade specific duties, such as driving, gunnery and the handling of implements in the case of armoured crewmen. Collective training must hone the ability of sub unit commanders to synchronize battlefield enablers inclusive of the combined arms team. Training should start with a re-familiarization of tank-infantry cooperation to include a review of the capabilities and safety precautions of the Leopard tank, marry-up drills, tactical movement, communications and target designation. Collective training scenarios should validate the proficiency of the BG in conventional war fighting operations (offence including the attack in complex terrain, defence including counter-moves, advance to contact, deception operations), while getting troops accustomed to the friction of the COIN battle space (vehicle breakdown/recovery, mine and IED strikes, suicide attack, ambush, casualty evacuation). Deploying soldiers and leaders should be familiar with combined arms operations from the troop-platoon level to BG, by both day and night.

Theatre mission specific training (TMST) and battle procedure should provide the training audience an appreciation of the complexities of the Afghan culture. In addition to the cultural awareness and language familiarization lectures that are routinely incorporated in the TMST package, subject matter experts should be employed to indoctrinate our soldiers on the dynamics and relationship between the three main threat groups in Southern Afghanistan: Taliban/Opposing Military Forces (OMF), narcotics leaders/fighters, and tribal factions. Training scenarios should include both simulated or real ANSF (ANA/ANP) play and civilians in the battle space (women/children, media, and private security firms), as well as an introduction to operations with SOF and



other coalition partners (that may or may not have specific national caveats that affect their ability to support Canadian ground operations). Training scenarios should be replete with the same friction soldiers will face while deployed to include the unavailability of enabler support and a routinely ambiguous intelligence picture augmented at times with questionable yet important human and signals intelligence feeds.

While the ability of the Leopard tank fleet to restore tactical mobility in different types of complex terrain is the 'bread-and-butter' of tank squadron operations in Afghanistan, pre-deployment collective training has included limited opportunities to plan for and perfect the use of the tank implements. Before unleashing the tanks to breach complex terrain in Afghanistan, all levels of command plan carefully with satellite imagery. War-gaming is conducted to maintain the element of surprise, remove from the enemy his terrain advantage and minimize collateral damage. It is imperative that we institutionalize in training the same planning and battle procedure considerations that will be essential to mission success in operations, and that the first time a dozer tank crew commander is seeing a deliberate grape field breach is not when he is conducting it under contact with the enemy. The complex terrain of Afghanistan should be replicated as much as possible in training at the Canadian Manoeuvre Training Centre, and combat teams should be afforded opportunities during force on force and live fire training to conduct deliberate breaching operations with tank implements, while testing the effects of main gun ammunition on structures similar in composition to grape drying huts and walled compounds. The replication of Afghan terrain and structures will cost money, but it will save the lives of Canadian and coalition soldiers.

Reception, Staging, Onward Movement, Integration (RSOI). Immediately following the completion of pre-deployment training, all tanks and engineer vehicles were cleaned, brought to serviceable condition and suspensions were replaced. Following the application of MEXAS add on-armor and completion of required maintenance, tanks were quarantined at 1 Service Battalion for shipment to theatre. Vehicles deployed from the Edmonton International Airport to an Intermediate Staging Base (ISB) at Manas, Kyrgyzstan via civilian AN 124 Antonov, where they were cross-loaded on to USAF C-17 Globemaster aircraft for the move to KAF. Leopard qualified drivers accompanied each chalk into theatre, while an armoured Master Warrant Officer (MWO) served in the capacity of Liaison Officer (LO) at Manas to facilitate the cross-loading and timely onward movement of vehicles. An ARV was positioned at the ISB, while the second recovery vehicle proceeded to Afghanistan on an early chalk. An advance party from the tank squadron and a Tank Activation Team (TAT) met the 17 tanks and four AEVs at KAF. The TAT consisted of an EME MWO with previous experience in Afghanistan, one each of Vehicle, Weapons and Fire Control System Leopard qualified technicians, and a handful of Leopard qualified armoured crewmen. In the three weeks that followed the arrival of the first tank in Afghanistan, the advance party and TAT worked diligently to identify and establish a tank maintenance facility at KAF, receive and account for all vehicles, and prepare the tanks for combat operations. The tank squadron leadership took advantage of this time to influence the sustainment concept and collaborate with the 3 Close Support Group Technical Assist Visit (TAV) to source sufficient spare parts, major assemblies and tooling holdings, while implementing an aggressive in-theatre training package and rehearsals for the remainder of the Squadron.

The successful deployment of the tank squadron in extremely compressed timelines was a testament to the competence and determination of countless soldiers, leaders and staff officers at all levels in the CF, both at home and abroad. The generation and early deployment of a LO to the ISB and a TAT into theatre to receive and kit tanks was vital to the timely introduction of this capability into combat. This TAT/TAV concept should be sustained and implemented again in the future, however, there are other considerations that should be assessed more carefully the next time we send armour into combat. Most important of these factors is the need to address early in the planning process the consolidated sustainment requirements of the Leopard fleet of vehicles over a continuum in operations. While installing MEXAS add-on armour and effecting vehicle repairs in Canada, a great deal of tooling, crew and safety equipment went missing prior to the quarantine of vehicles. As spare parts, tooling and POL products were not scaled for properly in Canada, these critical supplies were late in arriving at KAF and the serviceability of the Leopard fleet of vehicles suffered early on as a result. It was not until late November 2006 that a complete upload of 105 mm ammunition had arrived at KAF, precluding the timely deployment of the entire squadron forward.

While the image of a Leopard tank rolling off the back of a C-17 is perhaps more appealing to the media, the first chalks into theatre should be filled with the armoured recovery assets, mobile repair team vehicles, specialty tooling and POLs, and sufficient spare parts for 30 days of operations. Without these critical parts and combat supplies identified, received and organized at KAF, the tanks are useless. In addition to generating a LO for the ISB, escorts for the vehicles and a TAT for reception of the vehicles, the generating formation should deploy a LO team to Ottawa to inform Canadian Expeditionary Force Command (CEFCOM) and Canadian Support Command (CANOSCOM) planning and battle procedure. The LO team should consist of an armoured officer and senior maintenance technician, ideally with previous experience in the deployment of armour on operations.

Battle Procedure/After Action Review Process. All moves outside the relative security of KAF or a FOB in Afghanistan are considered combat operations. Accordingly, orders are issued for all operations, using the standardized NATO orders format. When time was particularly constrained or when it was important leadership at all levels understood clearly the sub unit commander's intent and concept of operations, the A Company/B Squadron 1 RCR BG Combat Team Commander frequently issued orders to the crew and section commander level. Given the complexity of COIN operations and the need to minimize collateral damage during breaching operations, rehearsals were always conducted to include a Rehearsal of Concept (ROC) drill, review of 'actions-on' and war game of potential 'what-if' scenarios. Satellite imagery was used extensively to plan breaching routes through vineyards and dense terrain, while Information Management System for Mine Action (IMSMA) data



provided current situational awareness on known minefields and historical IED locations. The battle captain submitted intelligence and terrain analysis requests, and products were normally pushed forward to the squadron within 24 - 48 hours of receipt of the request. The ANA with Operational Mentor and Liaison Team (OMLT) personnel attended routinely orders groups and were invited to participate early in the planning process. Representatives of higher-level enablers (TUAV, CAS, aviation) were rarely available for orders, but unit and brigade operational staffs conducted extensive liaison to coordinate resource requirements when necessary. Immediately following the completion of a mission, either the officer commanding or battle captain consolidated feedback from each of the troops and platoons on areas to improve and sustain for future operations. These points were discussed at the squadron level, changes were institutionalized if pertinent, and reports were forwarded to the Army Lessons Learned Officer at KAF.

**Coalition Interoperability.** Since deploying to Afghanistan in October 2006, Leopard tank crews have fought alongside Canadian, American, British, Dutch and Afghan soldiers, and have relied extensively on critical enabler support provided by a multitude of other troop contributing nations. The issue of national caveats has received extensive media play in recent months, and there has even been speculation the initial deployment of the tank squadron forward to link up with the BG in contact was delayed in part by the pending Dutch general election in November 2006. While it is important to be cognizant of these caveats and sensitivities, troops at the tactical level only need to know what support they can rely on in a fight with insurgents. Sub units were normally required to submit to BG operations staff 48-72 hours in advance requests for dedicated TUAV, aviation and intelligence support, while the CAS 'line-up' was pushed on a daily basis. While TUAV support was generally accessible to the sub unit as required, attack aviation and CAS were normally held in reserve, responsive on short notice to the declaration of Troops in Contact (TIC). The sub unit FOO/JTAC team normally controlled the allocation of indirect fires, CAS and attack aviation, however, calls for gun and close combat attack (Apache) fire were routinely conducted by troops on the ground.

The risk of fratricide in a coalition environment requires commanders at all levels to plan operations carefully. Language barriers, tactical differences, battle fatigue and the fog of war all conspire to obscure the situational awareness of troops in close combat with the enemy. To mitigate the threat of 'blue-on-blue' fire, the Canadian BG has standardized vehicle and personal Identification Friendly Force (IFF) markings and standard operating procedures. IFF marking schemes are communicated to coalition partners during orders and rehearsals, and direction related to the open fire policy and authorized rules of engagement (ROE) is also reviewed to minimize the potential of collateral damage. It is imperative that communications information be exchanged during orders, and that radio checks are conducted during battle procedure prior to crossing the line of departure. American SOF and OMLT, for example, routinely reported as outstations on the tank squadron combat net when working with armour.

**Firepower.** The Leopard C2 tank allows us to 'reach out and touch the enemy' with precision direct fires to ranges of 4000 meters, nearly twice the effective range of the M242 25 mm chain gun mounted on our LAV fleet. The Taliban choose not to fight us in the open desert for obvious reasons. Rather, our enemy finds sanctuary in grape drying huts and compounds with concrete-like walls measuring over a meter in thickness. Prior to the deployment of the Leopard tank, massive volumes of 25 mm fire from the LAVs achieved limited results against these structures, often requiring the BG to resort to the use of aerial bombardment or risk the deployment of dismounted soldiers forward to affect a breach with anti-tank weapons or demolitions. One 105 mm HESH round from the Leopard C2 can punch a hole in excess of five by five meters through a grape drying hut or compound wall, penetrating structures with reduced collateral damage to surrounding infrastructure and less risk to our dismounted soldiers. While the importance of infantry in the fight-through and deliberate clearance of objective areas is irrefutable, it makes little sense to send dismounted soldiers onto an enemy objective without first eliminating known resistance from a distance with 105 mm HESH. The tank squadrons attached to the TF 3-06 and TF 1-07 BGs have been able to kill numerous insurgents at ranges of 150 - 3800 meters while mitigating the exposure of our dismounted infantry soldiers to enemy direct fire. Both the coaxially mounted and anti-aircraft configured 7.62 mm C6 General Purpose Machine Guns mounted on the Leopard C2 have been used to engage and suppress dismounted insurgents at close range. The wooden stock assembly on all anti-aircraft MGs has been replaced with a spade grip assembly to allow crews to bring the weapon to bear more quickly, while maintaining a lower profile in the turret.

**Mobility/Breaching Operations.** A common misconception is that the tank is primarily an anti-armour platform. This is false, especially in the environment we find ourselves fighting in currently. The Taliban seek tactical advantage in terrain impassable to wheeled vehicles and they have used effectively, when able to predict ISAF avenues of approach, 'hit and run' tactics that include the use of small arms/RPG ambush, suicide attacks and IEDs. Equipped with a dozer blade, mine roller and mine plough in each troop of four tanks, the Leopard fleet of vehicles has restored tactical mobility to the combined arms team in Afghanistan through its ability to penetrate grape and marijuana fields, clear mine and IED belts, and breach mud walls and compounds that were previously impassable to the LAV III. The mobility options created by the tanks and armoured engineers afford the combat team commander additional ingress routes, making it more difficult for the enemy to site defensive positions, while decreasing the risks to less protected coalition soldiers. Combat teams grouped with armour have created on numerous occasions throughout the past year improvised roads suitable for wheeled vehicle movement during cordon and search and offensive operations. The enemy was kept off balance, constantly guessing from where the combat team would advance, and the tanks were able to form a 'ring of steel' around the infantry as they conducted deliberate clearance operations in urban areas. Both tank squadrons have used the dozer blades and ploughs extensively to conduct hasty and deliberate minefield breaches and break into complex terrain in order to destroy the enemy and extract personal and vehicle casualties.



Extant Canadian breaching doctrine works. Mechanized combat teams move as a default in column, with tanks leading, unless extremely confident of the absence of mines and IEDs. When required to slice through complex terrain to close with and destroy insurgents or extract coalition casualties, combat teams always attempted two lanes to ensure freedom of movement. A breaching team consisting of a command and control element, tank troop, AEV Badger, field engineer section, infantry platoon, and recovery and medical assets was assigned to each lane. Dozer tanks or AEVs led in close terrain in order to slice through vineyards and irrigation systems, and plough tanks were pushed forward in open/flat terrain to confirm routes for the presence of mines/IEDs. 'Run-up' positions were dozed away from the lane every 50 meters, ensuring the route remained clear for recovery and medical vehicles to effect extraction, and to ensure the all-around protection of the combat team as it advanced in complex terrain. The field engineer section with dismounted close protection conducted vulnerable point searches at all choke points and suspicious areas to confirm the presence of mines/IEDs. Unless the combat team could maintain observation on the entire lane throughout the duration of the operation, it would exfiltrate the area on another route or would confirm lanes with the plough tank leading. The tank squadron commanders controlled the move to and break into enemy objectives, while the infantry company commander naturally retained responsibility for the fight through and consolidation phases.

There are limitations to the tank implements. As discussed already in this paper, the collateral damage caused by tanks and the aggressive use of their implements can impair our ability to achieve mission success in Afghanistan, where reconstruction is the focus of our efforts. Equally important, there is no system on the battlefield that has the capacity to neutralize without exception all mine/IED threats. While tank ploughs have pushed countless anti-tank mines into their spoil and saved coalition soldiers' lives, IEDs have occasionally detonated on impact with the implement, rendering it ineffective. A Squadron 2 RCR BG has used effectively the tank rollers as an improvised Route Clearance Package (RCP) to mitigate the impact of pressure plate detonated IEDs (PPIED), however, we should not gain a false sense of confidence that this implement can protect our soldiers from command detonated and remote control detonated IEDs. Further, the rollers take considerable time to mount, they require a larger turning radius and they keep us on the tight, canalizing roads of Afghanistan – exactly where the Taliban prefer to plant mines and IEDs.

Protection. Leopard C2 tanks have saved Canadian and Afghan lives. While no vehicle on the battlefield is invincible, the Leopard C2 is equipped with add-on MEXAS composite armour panels and spall liner to increase crew protection from direct fire attacks. The Leopard 2A6M will also be prepared with additional turret protection and an improved belly blast protection package to reduce the threat of mines and IEDs. Leopard tanks and their crews deployed to Afghanistan have survived numerous IED and anti-tank mine strikes and recently recoilless rifle, RPG 7 and suicide attacks that may have been catastrophic to other fleets of vehicles. More important than the protection the Leopard offers to its crewmembers, however, is our ability to put 55 tonnes of steel between our dismounted soldiers and the enemy. The tank squadron in Afghanistan is routinely called upon to establish a cordon around objective areas and provide tanks in intimate support to dismounted infantry soldiers as they conduct fight-through and clearance operations in close combat.

Deterrence/Psychological Impact. The psychological value of the tank is well recognized. Knowledge of the increased firepower and protection offered by the Leopard tanks raised the morale and offensive spirit of the 1 RCR BG, a battle tested unit that had sustained near continuous combat with the enemy for two months prior to the arrival of B Squadron. The enemy has been less enthusiastic with the capabilities of the tank and the synergies developed by the combined arms team. Numerous signals and human intelligence reports confirm that low-level Taliban fighters are terrified of the tanks and their ability to manoeuvre, and they are often reluctant to attack coalition forces equipped with integral armoured assets. While the tanks have clearly had a significant psychological impact on the insurgency, armoured leaders serving in combat are not so naïve to think the enemy will not work aggressively to find a way to kill Canadian tanks.

Heat Casualty Mitigation. 2 RCR BG tank operations have been impacted significantly by the heat of the Afghan summer, and a lack of air conditioning and the hydraulic turret drive systems on the Leopard C2 has exacerbated the situation. With external temperatures routinely approaching 50 degrees Celsius in the sun, armoured crews have endured temperatures in excess of 65 degrees Celsius inside the Leopard tank. Tank squadron leadership at all levels has been called upon to develop innovative solutions to minimize the impact of the heat on the health of our soldiers and the serviceability of the tank fleet. Combat operations are routinely conducted at night or early in the morning to take advantage of cooler periods of the day, and leaders have been mandated to institutionalize in their battle rhythm forced hydration. Cooling suits have recently been introduced into theatre and feedback from the soldiers using them has been tremendous. These water-cooled vests have reduced significantly the core body temperatures of armoured crewmen, allowing them to sustain combat operations for greater periods. B Squadron 1 RCR soldiers also developed for each of the tanks improvised dust skirts to reduce the intake of dirt and debris into the tank exhausts. These modifications have increased several times over the operating range of the Leopard before over-heating.

#### The Next Bound: Recommendations on the Way Ahead

Leopard 2. While the Leopard C2 has performed in combat exceptionally well, this platform is 30 years old and is starting to show signs of its age. B Squadron 1 RCR BG soldiers submitted to the chain of command in November 2006 a summary of recommended modifications to make the Leopard C2 more suitable for COIN operations in the harsh environment of Afghanistan. Indicative of the tremendous support provided to our soldiers by both military and civilian leadership, the Government of Canada announced in April 2007 that it would not only address Leopard C2 deficiencies in the interim, but that it would authorize the lease for immediate combat operations of 20 Leopard 2A6M from the German Army, and a subsequent purchase of 100 Leopard 2A4 and 2A6 from the Dutch. While this tank has not yet been tested in combat, many countries



revere the Leopard 2 as one of the best in the world. Weighing in at over 60 tonnes, the Leopard 2 boasts an impressive 1500 horsepower engine (compared to the 830 horsepower of the Leopard C2), and it is equipped with the L55 120 mm smooth bore gun. An electric drive turret allows the gun to be traversed much more quickly, while reducing significantly the heat inside the vehicle. Most importantly, the Leopard 2A6M will provide to our soldiers unprecedented protection from the mine and IED threat in Afghanistan.

Unfortunately, the Leopard 2 is not yet equipped with the tank implements that have saved many lives in operations. An armoured engineer vehicle on a Leopard 2 chassis (Kodiak) is employed by the Swiss Army, however, it is unarmed and not yet employed by other countries. In order to ensure our tactical battlefield mobility and protection is not impaired with the introduction of the Leopard 2, technical staff should seek to design and apply immediately a modification to the Leopard 2 that will allow implements to be mounted. Tests will need to be conducted on the impact of mounting implements on to this chassis, which is already 15 tonnes heavier than the Leopard C2. Consideration should be given to retaining a mixed fleet of Leopard C2 and Leopard 2 vehicles in theatre until this technical issue can be resolved. While the deployment of the Expedient Route Opening Capability (EROC) – Canada's version of the RCP – will reduce the risk to our soldiers while forced to move on routes and through canalizing terrain, this system does not have ploughs capable of conducting hasty minefield extractions, nor is it equipped with dozer blades to slice through complex terrain when required. Many of the protective advantages of the Leopard 2 will be negated with the absence of implements.

The 105 mm High Explosive Squash Head (HESH) round is the 'bread-and-butter' munition for the tank squadron in theatre: each round knocks five by five meter holes into grape drying huts and we have found it highly effective against dismounts at ranges of 150 to 3800 meters. Although the Swedish Army has apparently fielded a 120 mm high explosive round and experimentation in the United States is ongoing with a 120 mm Insensitive Munitions High Explosive - Tracer (IMHE-T) munition, Canadian Leopard 2A6M tanks will deploy initially without this capability. Until we are able to introduce to combat a tested 120 mm HE round, we should assess immediately the accuracy and breaching capability of different variants of 120 mm High Explosive Armour Piercing (HEAT) and practice ammunition, and we should consider the acquisition of a canister round for the anti-personnel role in close combat. Armoured Piercing Fin Stabilized Discarding Sabot (APFSDS or Sabot) will continue to have limited value in Afghanistan. This munition is most effective against other armoured vehicles, with which the Taliban are not equipped. The Sabot round offers minimal breaching capability, and it actually threatens increased collateral damage, as it does not explode on contact with its intended target. Tests conducted by the Danish Army on the DM 12 HEAT round have shown positive breaching effects, and modifications to the DM 33 APFSDS round have also increased the fragmentation of the round on impact with the target.

The Future of the Leopard in Afghanistan. Canada's role in Afghanistan is changing, and it will continue to evolve until the end of our current mandate, in February 2009. (Editor's Note: Since writing, the Government of Canada has extended the current mandate in Afghanistan to 2011.) Cognizant that our ticket out of that country will be the creation of a credible and effective military and police force, the Chief of the Defence Staff, General Rick Hillier, announced recently his priority now is to devote more energy to the capacity building of the ANSF.<sup>5</sup> Effective with the immediate deployment of the 3rd Battalion Royal 22e Régiment (3 R22eR) BG, one of the three infantry companies previously committed to combat operations in Kandahar Province will be tasked to assume the responsibilities of an OMLT. The OMLT, embedded with three Kandaks (battalions) will train and mentor Afghan soldiers and it will maintain liaison with ISAF forces in order to facilitate enabling support for ANA operations. Two mechanized infantry companies, a tank squadron, a reconnaissance squadron, an artillery battery and a composite engineer squadron have been retained in the Canadian BG for continued security operations.

The Canadian BG will continue to buy time for the advancement of ANSF capacity building and reconstruction initiatives by keeping the Taliban off balance through aggressive security operations. With fewer than 1000 soldiers available for kinetic operations, we will be challenged to find an appropriate balance between holding key terrain in areas the Taliban are most likely to undermine support for the Government of Afghanistan while being able to project devastating combat power throughout the entire AO. Assuming other countries will not in the near term contribute additional ground forces for operations in Kandahar Province, the Canadian BG will likely have to task as a steady state one infantry company, augmented with key battlefield enablers, to seize and hold ground of strategic importance to ISAF. This company could retain two to three FOBs within the designated Canadian AO, in which steady state operations would be synchronized closely with ANSF and the PRT initiatives, while disrupting insurgents attempting to infiltrate the area.

The tank squadron and the remaining mechanized infantry company should form the basis of a mobile strike force, capable of surging rapidly and violently throughout Kandahar Province to locate and hammer Taliban cells. In order to promote the credibility of the ANA, all operations should be, or at least perceived to be, Afghan led. The mechanized combat team would serve as a very visible indicator of the combat power at the disposal of the ANA, and it could facilitate the transition and evolution of our commitment to Afghanistan. As conventional forces thin out in favour of bolstering the OMLT and PRT, the mechanized strike force could be retained as the Joint Task Force Afghanistan Reserve. We should avoid the temptation to redeploy to Canada first the Task Force Afghanistan Enhancement Package simply because it was last on the ground and perceived to be of least importance to the continued success to our mission. By the time we are ready to declare the ANA capable of ensuring the security of Southern Afghanistan, this force will have sufficient dismounted soldiers in its ranks. It will not, however, have its own integral enablers provided currently by the coalition.



A reinforced Canadian mechanized combat team organized with a tank squadron, infantry company, armoured engineer troop, reconnaissance/ISTAR troop, artillery battery (with FOO/JTAC team), integral echelon and PRT/CIMIC/PSYOPS detachments should remain on the ground until another coalition partner is prepared to assume our responsibilities in Kandahar, or until the ANA is able to truly stand on its own. Although a combat team is normally commanded by a major, a lieutenant-colonel should command this tactical grouping as it would be stacked with multiple enablers and to ensure the ability of this organization to influence JTF-AFG battle procedure.

### Conclusion

Sustained combat in Afghanistan for the past 18 months has confirmed the effectiveness and professionalism of the Canadian Army, however, many of our observations from battle are not new. Perhaps most obvious of the lessons we have relearned is the importance of the combined arms team in full spectrum operations, and the continued significance of the tank and armoured engineers in the COE. While our understanding of the threat and the complexity of operations in the modern battle space is sound, we have been excessively optimistic about our ability to find the enemy and determine his intentions without having to fight for information. We will strive to achieve 'knowledge based' and 'sensor led' operations, but we are not there yet. Until we can deny the enemy a vote, it will be necessary to form and deploy flexible combined arms teams capable of advancing to contact, and crushing opposing forces with overwhelming combat power and manoeuvre in extremely complex terrain, by day and by night.

Many of the force developers and critics of armour that informed recent Army Transformation initiatives argued that tanks had become increasingly irrelevant in the COE for a multitude of reasons: they are expensive to maintain, they are not easily deployable, and they can be vulnerable in complex and urban terrain. These observations are true, but they are self-evident and apply to most other elements of the combined arms team, all of which have their own weaknesses and deficiencies when operating independent of the other enablers. Providing increased firepower, protection, tactical battlefield mobility, and a definitive psychological impact, the tank will remain an invaluable tool in the arsenal of the Canadian Army for the foreseeable future.

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### Endnotes :

<sup>1</sup> Lavoie, Lieutenant-Colonel Omer. Quoted by Graeme Smith, "Conquering Canadians Take Stock," in *The Globe and Mail*, 13 September 2006, <http://www.theglobeandmail.com/servlet/story/RTGAM.20060912.wliveafghan0913/BNSStory/specialComment/?pageRequested=all>; Internet; accessed 20 July 2007.

<sup>2</sup> DND Backgrounder: "Military Strengthens its Reconstruction and Stabilization Efforts in Afghanistan", 15 September 2006, [http://www.mdn.ca/site/newsroom/view\\_news\\_e.asp?id=2065](http://www.mdn.ca/site/newsroom/view_news_e.asp?id=2065); Internet; accessed 21 July 2007.

<sup>3</sup> Wallace, Michael. "Leopard Tanks and the Deadly Dilemmas of the Canadian Mission to Afghanistan", Canadian Centre for Policy Alternatives Foreign Policy Series, (Volume 2, Number 1, February 2007), [http://policyalternatives.ca/documents/National\\_Office\\_Pubs/2007/Leopard\\_Tanks.pdf](http://policyalternatives.ca/documents/National_Office_Pubs/2007/Leopard_Tanks.pdf); Internet, accessed 30 July 2007.

<sup>4</sup> Ibid.

<sup>5</sup> Hillier, General Rick. Quoted by Levitz, Stephanie, "Hillier Says Training Afghan Army Now Top Priority", <http://cnews.canoe.ca/CNEWS/Canada/2007/06/17/4268022-cp.html>; Internet, accessed 2 August 2007.

