

OPERATIONAL ANALYSIS ON THE USE OF DIRECT FIRE SUPPORT VEHICLES

by Major Les Mader

In a recent Commentary column in *Canadian Military Journal* [Spring 2003], Professor Martin Shadwick argued that Canada's decision about the future of its Leopard C2 tanks "... must rest on well-argued and objective operational analysis, not on bureaucratic politics and political imagery."¹ In fact, over the past eight years, the Operational Research Division (ORD) at National Defence Headquarters (NDHQ) has carried out a number of combat-simulation-based operational research studies that help put the role of direct fire support vehicles (DFSV) like the Leopard C2 into perspective.

Eight recent ORD studies² are relevant to any discussion of the replacement of the Leopard. They looked at Canadian ground forces carrying out a variety of missions on a range of terrain. In most of these studies, the enemy was modern, but not state-of-the-art. For analysis reasons, in the majority of those studies, neither the Canadian force nor the enemy force was able to employ the complete range of combat functions and capabilities.

The recent study of the strengths and weaknesses of a proposed structure for the Army's main contingency force (MCF) brigade group did, however, allow both sides to use at least some part of each of the combat functions. At the same time, the MCF brigade group was allowed only limited support from allies so that the study could focus on the strengths and weaknesses of the brigade group without those factors being masked by the effects of other forces. In the defensive scenario, it was assumed, however, that allied air operations had defeated one-third of the advancing enemy division, and that the enemy would have only limited air support.

Going beyond the straightforward analysis of combat power, one of the studies considered a less frequently discussed element of the 'future-of-the-tank' debate: the effectiveness of various options for replacing Canada's specialized armoured engineer vehicles that are based on the Leopard chassis. Explosive line-charge minefield breaching, the current high-speed armoured tractor, the M113 engineer section vehicle, and a notional LAV III-based engineer vehicle were all investigated as possible replacements for the Leopard-based vehicles.

In this study, company groups and combat teams were required to get past defended obstacles in both open and close terrain. In all scenarios, the enemy force was weak (section or platoon strength), with limited access to indirect fire support.

Taken together, the eight studies provide a clear sense of just how much a capable DFSV can contribute to a combined arms team that cannot call upon powerful and immediate air and indirect fire support. A synthesis of six of these studies found the Canadian DFSVs that were used destroyed from 37.5 percent to over 80 percent of the key enemy systems lost.³ It also found, though, that the inherent weakness of these relatively lightly armoured, 105 mm-armed DFSVs meant that they suffered very heavy losses (11.1 percent to 77.8 percent) in achieving their success.⁴

The MCF study reinforced the findings of these earlier studies. It found that the weakness of the Leopard C2, among other key systems, meant that Canadian offensive operations could be stopped by a small number of capable enemy systems, and that defensive battles were bloody struggles by the Canadians to hold the line.⁵

The eighth study found that lighter vehicles and explosive line-charge minefield breaching will not provide an adequate replacement for our current armoured engineer vehicles. This study concluded that "... In general, the LEO [Leopard]-based mobility support assets ... were superior to those available in the [other] cases."⁶ The study recommended that none of the potential replacements for the Leopard-based armoured engineer vehicles should be considered as currently conceived.⁷

Some might question the relevance of the above studies, as all of them looked at relatively large (combat team to brigade group) combat operations, and because the Canadian forces involved fought with little outside support. Critics might hold that Canadian troops would never be placed in such situations in the modern era.

The first of these objections can be answered by noting that lessons from combat are not always affected by the scale of the battle: bad or out-matched equipment

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does not usually become more capable as battles become larger or smaller. If our soldiers are called upon to fight a half-hour skirmish or an actual battle, they will live or die based, in large part, on the relative capabilities of their equipment and that of their adversary.

This point is highlighted by the study of the use of the Armoured Combat Vehicle (ACV) in operations other than war (OOTW). This study compared relatively small Cougar- and ACV-based forces carrying out typical OOTW missions in open, mixed and mountainous terrain. The enemy forces in these scenarios were equipped with widely available, 1970-era equipment. To gain an understanding of the real capabilities of the Cougar and ACV, the enemy in the study was required to fight the Canadian force. This study assumption was realistic, given the Canadian experience in confused situations like the UNPROFOR mission in Bosnia, where the opposing forces were willing to fight and the deployed peace support force did not have the combat power and/or the will to impose a cease-fire. After looking at six OOTW missions carried out by both Cougar- and ACV-equipped forces in three different terrain settings, the ACV study found that providing Canadian peacekeeping/OOTW forces with a capable DFSV, in place of the Cougar, made a significant difference in terms of mission success and friendly losses.⁸

In answer to the second objection, one simply has to look at the same UNPROFOR mission. For some three years, Canadian and other UN peacekeepers were shot at, taken prisoner and harassed by opposing forces that wanted

peace only on their own terms. During these years, UNPROFOR did not benefit from the troop-contributing nations' clear military superiority over the various Bosnian factions. All that UN troops on the ground could do was make the best of a bad situation. In fact, debates over the use of outside air power caused a very public rift between the US government – which had no troops exposed to Bosnian Serb retaliation – and the troop-contributing nations that did.

The removal of the discipline imposed by the Cold War has led to an explosion of situations like Bosnia – where ethnic hatred runs rampant. Canada's peacekeeping tradition and humanitarian ideals mean that we are likely to end up in another situation like Bosnia where we do not have readily available conventional superiority or where we are unable to use it. In such situations, our soldiers on the ground will require equipment that is capable enough not to have to depend on a complex set of linkages to other forces to accomplish their mission and survive.

Professor Shadwick is clearly correct in his view that military equipment questions should be decided on the basis of proper analysis. A number of recent operational research studies do provide information that should help make sensible decisions about the replacement of the Leopard.

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NOTES

1. See Martin Shadwick's Commentary, "The Tank and Asymmetric Choices" in *Canadian Military Journal*, Vol. 4, No. 1 Spring 2003.
2. Major D.C. Wilkinson and M.K. Ormrod, *IRON NOBLE: Armoured Combat Vehicle Study* (Ottawa: Canadian Government 1996); Major R.J. Round and F.W.P. Cameron, *BRONZE PIKE – LAV Recce Vehicle (COYOTE) Study* (Ottawa: Canadian Government 1997); M.K. Ormrod, P.R.S. Bender and Major J.J.L.C. Noël de Tilly, *QUARRE de FER: Analysis of the ACV in Warfighting Tasks* (Ottawa: Canadian Government 1998); M.K. Ormrod, P.R.S. Bender and Major D.T. Davison, *IRON RENAISSANCE: Evaluation of the LAV III Combat Team in Conventional War Operations* (Ottawa: Canadian Government 1999); Major L.R. Mader, P.S. Ladouceur and P. Bender, *BRONZE SHIELD: Evaluation of the Threat From Volumetric Munitions in a Combined Arms Battle (U)* (Ottawa: Canadian Government 2000); Major J. De Carufel, M.K. Ormrod and P.R.S. Bender, *IRON UNGUIS: An Examination of Proposed Anti-Armour Weapon Options for the Infantry* (Ottawa: Canadian Government 2001); M.K. Ormrod, P.R.S. Bender and Major P. Hewitt, *IRON XINETE: Land Force Battle Group Mobility Support Study* (Ottawa: Canadian Government 2001); and, Major J.A. Summerfield and M.K. Ormrod, *Main Contingency Force Brigade Group Combat Capabilities Study (BRONZE ZIZKA)* (Ottawa: Canadian Government 2003).
3. See the author's article, "Light Punching: The Case for an Improved 105 mm Tank Round", *Army Doctrine and Training Bulletin*, Volume 4, No. 4 Winter 2001 – 2002.
4. *Ibid.*
5. Summerfield and Ormrod, *Main Contingency Force Brigade Group Combat Capabilities Study (BRONZE ZIZKA)*, pp. 27, 35 – 37, 50, 54, 84, 91 and 96 – 98.
6. Ormrod, Bender and Hewitt, *IRON XINETE: Land Force Battle Group Mobility Support Study*, p. 31.
7. *Ibid.*, p. 33.
8. Wilkinson and Ormrod, *IRON NOBLE: Armoured Combat Vehicle Study*, p. 97.