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INTEROPERABILITY: A MUST FOR THE CANADIAN FORCES

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ABSTRACT

The Canadian Forces (CF) must be interoperable with key allies; more specifically the United States (US) military. Variation of this statement can be found in every major Government of Canada and Department of National Defence (DND) strategic publications since the early nineties. This in itself should not be surprising since the Canadian military has relied extensively on interoperability with more powerful allies since its creation. Initially that powerful friend was Great Britain and, since the Second World War, America. The creation of the North American Aerospace Defence (NORAD) agreement and the North Atlantic Treaty Organization (NATO) have only accentuated the CF's push to become interoperable with the US and other key allies. This paper is not arguing the need for interoperability at the combined level (with key allies), since the CF is mandated to work towards that goal, but it does take a cursory look at the lack of interoperability at the joint level. It focuses next on two key events – the end of the Cold War and the September 11 (9/11) terrorist attacks – and identifies the new interoperability challenges they created for the CF. These events, especially the 9/11 attacks and what follows, have brought on the need for the CF to work within a whole of government approach. This is required not only for domestic operations, but as exemplified by the conflict in Afghanistan, for deployed operations as well.

The new challenges, therefore, are for the CF to be able to effectively operate in four domains; as part of a multinational coalition, at the joint level and, within a whole of government approach with other governmental departments and non-governmental organizations. A force capable of operating within and successfully interacting with

these four domains is referred to as a JIMP-capable force – Joint, Interagency, Multinational and Public. The three roles assigned to the CF in the Canada First Defence Strategy –defending Canada, defending North America and contributing to international peace – will require a JIMP-capable organization that will need to be more interoperable on more levels then before. Even with, and to some extent, because of the changes brought on by CF transformation, it is unlikely that the Canadian military will be able to achieve the required level of interoperability and, in fact, might fall behind the US due to the increasing technology gap. This paper argues that unless an organization responsible for interoperability is created and provided with the necessary resources to affect the required changes, the CF will not be able to effectively operate with its allies or within the whole of government approach. Other military organizations have created such organizations and the CF, which has just embarked in a second stage of transformation, should do the same.

CHAPTER 1: INTRODUCTION

> *In this increasingly unstable international threat environment, Canada must have armed forces that are flexible, responsive and combat-capable for a wide range of operations, and that are able to work with our allies.*
> – Canada's National Security Policy, released 27 April 2004 [1]

Much has been written on the need for the Canadian Forces (CF) to be interoperable, but most of the literature on the subject revolves around the requirement or in some cases the dangers, for the CF to be interoperable with the Unites States (US) military. One of the most significant publication on that subject, *The Canadian Forces and Interoperability: Panacea or Perdition?*, is a book edited by Ann Griffith, which contains various papers written in response to an original article by Middlemiss and Stairs entitled *The Canadian Forces and the Doctrine of Interoperability: The Issues*.[2] The book begins with the Middlemiss and Stairs article, which has a stated purpose to explore the Canadian defence doctrine of "interoperability" and to draw attention to its potential implications. Part two of the book, entitled "The Debate", contains nineteen articles ranging from discussions of specific military interactions, to historical consideration of the Canada-US military relationship, to broader discussions of security and military policy.[3] However, as suggested in the main article, this book focuses on the evolving relationship between the CF and the US military in the aftermath of the terrorist attack of 11 September 2001 and does not deal with other levels of interoperability.

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[1] Privy Council Office, *Securing an Open Society: Canada's National Security Policy* (Ottawa: Privy Council Office, April 2004), 50. The theme "able to work with our allies [interoperability]," taken from the introductory quote, is present throughout the National Security Policy.

[2] Danford W. Middlemiss and Denis Stairs, "The Canadian Forces and the Doctrine of Interoperability: The Issues", in *The Canadian Forces and Interoperability: Panacea or Perdition?*, ed. Ann L. Griffiths, 1-45 (Halifax: Dalhousie University press, 2002).

[3] Ann L. Griffith, "The Canadian Forces and Interoperability: Panacea or Perdition?" (Halifax: Dalhousie University press, 2002).

This requirement to be interoperable with the US military has been a driving factor for the CF since WWII, but the achieved interoperability was largely intra-service. In other words, each of the CF environments have become relatively interoperable with their US counterparts, but not with each other. This lack of interoperability at the joint level has been the focus of many Canadian military authors since the end of the Cold War and many have argued that the CF focus should be to ensure that the Canadian military environments can effectively work together.[4] Papers such as *Jointness: The Need for the Canadian Forces to go Farther* by Maj Wynnyk[5] or *The Road to Jointness: Is Canada Heading in the Right Direction?* by Lieutenant Colonel Ploughman[6] conclude that indeed the CF should concentrate on becoming "more joint". Others state that the best way to become interoperable at the joint level is by ensuring interoperability at the combined level and thus rather than being mutually exclusive, as suggested by Col Boomer in his paper *Joint or Combined Doctrine: The Right Choice for Canada*,[7] the concepts are inexorably linked. Although there are differing thoughts on whether the CF should pursue joint or combined interoperability, everyone agrees that achieving interoperability at any level is not an easy task. Lack of resources, inter-services rivalries, as well as "stove-piped" procurement policies have all been impediments to interoperability, but the overwhelming factor has been the lack of clear leadership, and this despite clear directions from the strategic and political levels.

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[4] Army, Navy and Air Force are the three CF environments. However, when discussing Joint interoperability, this paper includes the Canadian Special Forces as well.

[5] P. F. Wynnyk, "Jointness: The Need for the Canadian Forces to go Farther", (Toronto: Canadian Forces Command and Staff College New Horizons Paper, 1997).

[6] Bruce Ploughman, "The Road to Jointness: Is Canada Heading in the Right Direction?", (Toronto: Canadian Forces College Advanced Military Studies Course Paper, 2005).

[7] M. F. Boomer, "Joint or Combined Doctrine: The Right Choice for Canada", (Toronto: Canadian Forces College Advanced Military Studies Course Paper, 1998), 11.

Every high-level document since, and including, the *1994 White Paper* have emphasized the need for the CF to be interoperable.[8] In June 1999, *Shaping the Future of Canadian Defence: A Strategy for 2020* was published and, although not a White Paper, this document was to be used as a "guide" for strategic planners. Strategic "imperatives" were identified and eight long-term "strategic objectives" were listed as "main pillars" – one of them being interoperability.[9] In April 2004, the Government of Canada promulgated its first-ever National Security Policy (NSP) and whenever that document deals with the CF, interoperability with the US military is always discussed.[10] The NSP articulates three core national security interests; protecting Canada and Canadians at home and abroad, ensuring Canada is not a base for threats to our allies and contributing to international security.[11] All of these areas incorporate various capabilities of the CF to adopt an "integrated" security system to better prepare Canada for current and future threats. That being said, when it comes to specifics on the CF's role within the NSP, the document refers to "cooperation," "collaboration," and "working closely," with "close allies" and "international partners."[12] The next high-level document mentioning the need for interoperability with the US was published in 2005 by the Canadian Department of Foreign Affairs: *Canada's International Policy Statement: A Role of Pride*

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[8] Department of National Defence, *1994 Defence White Paper,* (Ottawa: Canada Communications Group, 1994).

[9] Department of National Defence, *Shaping the Future of the Canadian Forces: A Strategy for 2020* (Ottawa: DND (CDS), June 1999).

[10] Privy Council Office, *Securing an Open Society: Canada's National Security Policy* (Ottawa: Privy Council Office, April 2004).

[11] *Ibid*., vii.

[12] *Ibid*., Throughout the NSP document, the importance of the US as an ally, as well as the ability to interoperate for security issues is highlighted.

and Influence in the World.[13] When discussing multinational operations, the document confirms that the key feature of interoperability is critical to successful Canadian participation to future coalition operations. More specifically it states that "Interoperability – the ability of armed forces to work together effectively on operations – will remain an essential ingredient in future multinational operations."[14] Finally, in its 2009 release of the *Canada First Defence Strategy* (CFDS), the Canadian government gives the CF clear direction concerning its three roles – defending Canada, defending North America and contributing to international peace and security – as well as the types and numbers of missions it expects the military to fulfill.[15] The CFDS further states that, for its role in the defence of North America, the CF, in order to be a "strong, reliable defence partner", must "remain interoperable with the US military".[16] Despite this significant body of strategic documentation that makes reference to interoperability as a must for the CF, [17] history has shown that lack of staff dedicated to that problem, as well as an underlying lack of priority has impeded the CF's progress towards true integration.[18] Recent events, both domestic and international, have reinforced the need for joint and combined interoperability, but have also identified a requirement for the CF to work within the whole of government approach. This creates new significant

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[13] Canadian Department of Foreign Affairs published, *Canada's International Policy Statement: A Role of Pride and Influence in the World*, (Ottawa: Canada Communications Group, 2005).

[14] *Ibid.*, 9.

[15] Canada First Defence Strategy; available from http://www.forces.gc.ca/site/pri/first-premier/June18_0910_CFDS_english_low-res.pdf; Internet; accessed 1 March 2010.

[16] *Ibid.*, 8.

[17] All of these high-level documents emphasis the need to be interoperable with Canada's key allies, most often singling out the US military. Joint interoperability is almost never mentioned in high-level publications.

[18] Bruce Ploughman, *The Road to Jointness*…, 18.

challenges for the Canadian military and the current, post CF transformation organization, is not setup to successfully address them.

The purpose of this paper is to examine the interoperability challenges faced by the twenty-first century Canadian Forces. The focus will be on the increased need for a whole of government approach and the on-going requirement to seamlessly operate with other militaries; especially with Canada's key allies. The analysis will demonstrate that despite high-level policies stating the need for interoperability, the realities of complex operational environments, lack of funding and the current organizational construct make it extremely difficult for the Canadian Forces to become effectively interoperable. This paper argues that unless an organization responsible for interoperability is created and provided with the necessary resources to affect the required changes, the CF will not be able to effectively operate with its allies or within the whole of government approach. However, with phase two of CF transformation there is an opportunity to implement key organizational changes that would help the CF achieve the required level interoperability.

This paper will start with some background information to demonstrate that the Canadian military has always relied on interoperability. It will then look at one of the interoperability problems, the word itself or what it means to different organizations. It will then review some of the most common definitions and provide various military definitions including the accepted CF version. A specific look at military interoperability will then be conducted through a discussion on the dimensions and degrees of interoperability as proposed by Michael Codner. The next chapter will then focus on the CF and identify its priorities regarding interoperability with its allies and finally discuss the requirement for the CF to be interoperable at the joint level as well as combined level.

This will lead to a discussion on the new security environment brought on by the end of the Cold War and, more specifically, by the 11 September terrorist attack; these events will be reviewed to assess their impact on the development of current CF doctrines and Government of Canada policies. These doctrines and policies will be examined to identify the interoperability requirements for the CF; the mandate to be interoperable with non-military organizations (whole of government approach) and the need to maintain interoperability with key allies. To identify the CF interoperability challenges, both of these requirements will be looked at separately; the concept of whole of government approach will be examined from the CF's point-of-view to assess its impact on future operations and the high costs associated with keeping pace technologically with our allies, specifically the increasing technological gap with the US. Next, a look at how Canada's key allies are tackling these challenges through transformation will be provided and will be compared to the CF efforts and its own transformation. Finally, this paper will conclude with a recommendation and a proposed way ahead for the CF to effectively meet twenty-first century interoperability challenges.

Background

Canada as a Nation, has never gone to war, participated in peace keeping operations or been involved in military conflicts alone. Since 1867, every time Canada deployed its military it has always been in support of, or with allies. Historically, Canada tried to model its military equipment, doctrine, training, and sometimes even its objectives and roles, to those of a patron power.[19] This modelling began early on in the

[19] Middlemiss and Stairs, *The Canadian Forces and the Doctrine of Interoperability*…, 14.

development of Canada as demonstrated in its relation to Great Britain and subsequently, at the onset on WWII, to the US. In earlier conflicts it was relatively easy to work with other militaries because tactics, technology (minimal technology gap between allies) and training were all fairly basic. By the end of WWII, however, with the nuclear age and the advances in military technologies, the Canadian military had to ensure it was equipped with similar, if not identical, technology to its key allies. During the Cold War, the CF's mandate was not only clear, but fairly straight forward; to protect Canada and Canadians against the Soviet threat. However, since Canada could not maintain its post-WWII military capability, the decision was made to defend the country through various bi-lateral and multi-lateral agreements such as the North American Aerospace Defence Command (NORAD) and the North Atlantic Treaty Organization (NATO).

NORAD, which was created to centralize operational control of continental air defences against the threat of Soviet bombers,[20] relied on early-warning radar stations and interceptor fighters based in Alaska and Canada. "From the perspective of command and control…NORAD represented the zenith of Canadian-American interoperability"[21], but many argue that this interoperability came at too high a cost. For example, in order to be interoperable with the US, the CF had to acquire American equipment, which according to some, effectively killed Canada's aerospace industry.[22] Others argue that because of the size of the country relative to its post-war military capability, Canada had

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[20] North American Aerospace Defence Command (NORAD) History; available from http://www.norad.mil/about/agreement.html; Internet; accessed 6 March 2010.

[21] John L. Orr, ""The Canadian Forces and the Doctrine of Interoperability: The Issues": a Response"", in *The Canadian Forces and Interoperability: Panacea or Perdition?*, ed. Ann L. Griffiths, 182-194 (Halifax: Dalhousie University press, 2002), 184.

[22] The cancellation of the *Avro Arrow* has often been linked to the signing of the NORAD agreement by the Diefenbaker government. "The NORAD agreement pressured Diefenbaker to cancel the program…because the US was ready to give Canada (at Canada's cost) Bomarks for protection."; available from http://www.suite101.com/article.cfm/life_in_canada/64930; Internet; accessed 9 March 2010.

no choice but to align itself with its powerful southern neighbour and eventually benefited by acquiring better equipment. In his response to Middlemiss and Stairs, John Orr admits that "the cancellation of the *Avro Arrow*…did in fact limit Canadian policy options and tie them more closely to American policy", but he concludes that "in final analysis, the reality is that by following a "buy American" policy, better and more modern equipment was usually acquired."[23] This "buy American" policy also ensured that the CF was, more often than not, interoperable with the US, something that was beneficial not only in the defence of North America, but also when operating within multi-national coalitions or as part of international organizations like the United Nations or NATO.

With NATO's creation, this became an issue for other militaries as well, and the need for standardization evolved and standard agreements (STANAGs) were created. However, and despite huge amounts of money and resources put towards them, STANAGs have over the years been seen as more of a suggestion then anything else. Although CF procurement policies often included STANAG as a requirement, it was typically competing with other key procurement factors such as Canadian content, proprietary conflict with industries, cost, as well as delivery schedule; more often than not, standardization lost out. As quoted by Anita Golderba during her presentation at the cataloguing session of the International Federation of Library Associations, "Standards are like toothbrushes, a good idea but no one wants to use anyone else's."[24] But without standardization one cannot be effectively interoperable and NATO, through agencies

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[23] Middlemiss and Stairs, *The Canadian Forces and the Doctrine of Interoperability*…,15.

[24] The Cataloguing Librarian, available from http://laureltarulli.wordpress.com/2008/10/16/standards-are-like-toothbrushes-a-good-idea-but-no-one-wants-to-use-anyone-elses/; Internet; accessed 2 March 2010.

such as the Military Agency for Standardization, truly advanced the cause of interoperability.[25] For the CF, interoperability with key allies is not only a must, but is also mandated by government. Involvement in interoperability forums within NATO or with other communities of key actors such as the American, British, Canadian, Australian (ABCA) Armies program or the Air and Space Interoperability Council (ASIC) is critical to achieving that aim.[26] However, to be truly interoperable requires more then just applying standards, especially within a military context. The next chapter will look at various definitions of interoperability to emphasis one of the problem; understanding what it means to be interoperable. A quick look at military definitions will follow.

[25] John L. Orr, *a Response*…,184.

[26] In 2006 ABCA added New Zealand as a member of its Armies' Standardization Program.

CHAPTER 2: INTEROPERABILITY

Interoperability or to be interoperable; what does it mean? In order to answer that question, one must first understand the meaning of the word and the first step should be to look for a definition. However, when researching this paper many more definitions ranging from the simple to the very complicated were uncovered. The many definitions are in fact part of the interoperability problem. It is critical that parties involved in making two organizations interoperable have the same understanding of the word. Therefore, this chapter and the next will look at interoperability in general, review some of the many definitions and then further describe the levels of military interoperability.

Definitions

A quick internet search provides no less then fifteen definitions for interoperability.[27] The first definition on the list is, not surprisingly, from the computer science field; it defines interoperability as "the ability to exchange and use information (usually in a large heterogeneous network made up of several local area networks)."[28] A more complicated definition is from the financial world; interoperability is "… the ability to transfer and use information in a uniform and efficient manner across multiple organizations and information technology systems. It underpins the level of benefits

[27] Google Definitions, available from http://www.google.ca/search?hl=en&defl=en&q=define:interoperability&ei=eIy_S5mYE4P-8AaB0eH4CA&sa=X&oi=glossary_definition&ct=title&ved=0CAgQkAE; Internet; accessed 2 March 2010.

[28] WordNet, available from http://wordnetweb.princeton.edu/perl/webwn?s=interoperability; Internet; accessed 2 March 2010.

accruing to enterprises, government and the wider economy through e-commerce."[29] Two commonly accepted definitions, yet two very distinct application of the word; a situation that is not specific to the civilian sector. The simplest definition is from the Oxford English dictionary which defines interoperability as: "Able to operate in conjunction."[30] Although the shortest, the Oxford definition correctly captures what it means to be interoperable. Unfortunately, and especially within a military environment, that definition is simply not sufficient. Not surprisingly therefore, the initial internet search also provides one military definition; the NATO Allied Administrative Publication 6 (AAP-6), which is published by the NATO Standardization Agency (NSA), defines interoperability as "The ability of systems, units or forces to provide services to and accept services from other systems, units or forces and to use the services so exchanged to enable them to operate effectively together."[31] Before focusing on that military definition, let's first look at interoperability as a whole by exploring the meaning or meanings of the word.

In layman's terms, interoperability is the ability to operate in conjunction with something or someone or "the ability of a system or a product to work with other systems or products without expending special effort to do so."[32] Middlemiss and Stairs defined interoperability as "the ability of systems, unit or forces to provide services so exchanged

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[29] Australian Government, available from http://www.finance.gov.au/Publications/australian-government-technical-interoperability-framework/glossary.html; Internet; accessed 2 March 2010

[30] AskOxford. available from http://www.askoxford.com/concise_oed/interoperable?view=uk; Internet; accessed 1 March 2010.

[31] NATO, available from http://www.nato.int/docu/logi-en/1997/defini.htm; Internet; accessed 2 March 2010

[32] IDABC, *European Interoperability Framework for pan-European e-Government Services, Version 1.0* (Brussels 2004); available from http://europa.eu.int/idabc/en/document/3761; Internet; accessed 7 November 2009.

to enable them to operate effectively together."[33] Andy Knight expands on that definition when he states that "To be truly interoperable one has to break down any barriers that might prevent the full realization of the union necessary to bring about the ease in operation envisioned by the concept."[34] This means eliminating as much as possible anything that hinders openness, sharing, communication and access between the entities wishing to become interoperable. This understanding of interoperability is used by library systems, university administrations and inter-governmental bodies. Knight argues that interoperability "…goes much further than the definition provided by Middlemiss and Stairs."[35] In fact interoperability has become one of the major buzzwords of the twenty-first century.

So why has the pursuit of interoperability become so important to so many organizations? And why are central and local governments across the world aiming to become interoperable? Knight states that "back-end administrative systems that underpin the operations of universities world over are being forced into interoperability and that library technicians across the globe have become specialists at designing interoperable systems."[36] He argues that this drive towards interoperability appears to lie in the notion that "the best way to address problem complexity within an environment of financial cutbacks is to merge knowledge, data, information and systems (i.e., to interface) with

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[33] Middlemiss and Stairs, *The Canadian Forces and the Doctrine of Interoperability*…, 184.

[34] W. Andy Knight, "Interoperability: The Next Stage in Canada-US Integration?", in *The Canadian Forces and Interoperability: Panacea or Perdition?*, ed. Ann L. Griffiths, 182-194 (Halifax: Dalhousie University press, 2002), 140.

[35] *Ibid*.

[36] *Ibid*.

like-minded actors."[37] If being interoperable provides like-minded actors with the ability to interface so they can resolve complex problems, then like-minded militaries should definitely want to achieve greater interoperability. But what does it mean to be interoperable within the military environment and what specific interoperability challenges are faced by military organizations? The following section provides military definitions and identifies some of the challenges specific to the military.

Military Definitions

Within the military context, Myron Hura *et al* use the NATO definition for interoperability: "The ability of systems, units, or forces to provide services to and accept services from other systems, units, or forces, and to use the services so exchanged to enable them to operate effectively together."[38] This definition however is too narrow as it focuses mainly on the technological dimension of interoperability. The US Armed Forces Joint Doctrine for Multinational Operations manual provides the following more extensive definition:

> International Rationalization, Standardization and Interoperability (RSI) with allies, coalition partners, and other friendly nations is important for achieving: the closest practical cooperation among their military forces; most efficient use of research, development, procurement, support, and production resources; and the most effective multinational warfighting capability. International military RSI applies to material and non-maternal matters.[39]

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[37] *Ibid.,* 141.

[38] Myron Hura, et al, Interoperability: A Continuing Challenge in Coalition Air operations. (Santa Monica and Arlington: Rand, 2000), 7.

[39] United States, Department of Defense, Joint Doctrine for Multinational Operations – Joint Publication 3-16 (Washington, DC: Government Printing Office, April 2000), 1-10.

This definition expands upon the previous one in that it considers collaborative research and development, procurement, support and production efforts to support multinational warfighting capabilities. In his paper, *Interoperability: The Key to CF Coalition Operations*, Cdr Marc Batsford states that the US military definition suggests "farther collaborative efforts towards design, engineering, industrial and trade patterns which would be mutually beneficial for coalition members."[40] This 'material' and 'non-material' dimension of interoperability is further supported by Kenneth Gause *et al*, who speculate that military coalition interoperability spans the complete spectrum of conflict. Gause argues that there are three types of military coalition interoperability, each characterized with discreet attributes. The first type is technical interoperability, which focuses on how military units from different countries provide service exchanges such as communications, information, intelligence products, and equipment. Gause's second type is operational interoperability, which considers how different multinational military organizations can come together and fight as one entity to accomplish the mission. This type would include doctrine, planning, training, and logistical support. Finally, Gause's third type is political/cultural interoperability, which considers how and why different countries fight from a cultural, linguistic, social and historical perspective.[41] LCol Wayne Silket adds to Gause's framework by offering a series of tangible military interoperability attributes, they are: goals, training, capabilities, equipment, logistics, culture, doctrine, intelligence and language.[42]

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[40] Marc W. Batsford, "Interoperability: The Key to CF Coalition Operations", (Toronto: Canadian Forces College Advanced Military Studies Course Paper, 2006), 7.

[41] Kenneth Gause, et al, US Interoperability with its High–End Allies, Center for Strategic Studies, Center Naval Analyses (Virginia: Center for Naval Analyses, 2001), 4.

[42] Jayne A, Silket, "A11iance and Coalition Warfare," Parameters vol. XXIII no. 2 (Summer 1993): 79-82.

Following Gause's interpretation and using Silket's attributes, it is easy to see why military interoperability is more challenging. To be fully interoperable across the strategic, operational, and tactical levels of war is extremely difficult and requires like-minded militaries to work together in dedicated forums in order to achieve it. One such forum is the NSA, which is responsible for "standardizing" NATO. Although often used synonymously, the terms standardization and interoperability have different meanings; standardization refers to the overall, multilevel goal of increasing the operational effectiveness of coalition military forces through various similarities.[43] Standardization is applied primarily to the areas of doctrine, tactics and procedures, and logistics.[44] It is ranked into the following four levels of increasing standardization:

a. compatibility: to operate without mutual interference;

b. interoperability: to operate more effectively together by exchanging services;

c. interchangeability: equal performance, exchangeable with minor adjustment;

d. commonality: using the same doctrine, procedures, or equipment.[45]

Commonly, the term interoperability is used to mean standardization possibly because it is the minimum level towards which the majority of forums strive.[46] However, as stated earlier, the two terms are not equal and to have agreed standards does not automatically mean interoperability.

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[43] Dean S. Mills, "Coalition Interoperability: An International Adventure"; Available from http://www.airpower.au.af.mil/airchronicles/cc/mills.html; Internet; accessed 3 March 2010.

[44] *Ibid.*

[45] MGen Giovanni Ferrari, "NATO's new Standardization Organization tackles an erstwhile elusive goal", NATO Review, Vol. 43, No. 3 (May 1995), 33.

[46] Dean S. Mills, *Coalition Interoperability…*

"Everyone wants standards, but no one wants to be standardized", this anonymous quote is one example as to why standards alone are not sufficient. Militaries and government must be willing to implement and follow the standards. As stated by then NSA director Rear Admiral Eriksen, in a 2002 speech to the European Institute, "…interoperability is probably the most important issue for militaries of today, and recent operations, such as those in Kosovo and Afghanistan, show that it is continually growing in importance."[47] He did not speak of standards, but of interoperability. The "standards piece" within NATO is fairly well developed and NATO Standards (STANAGs) are often the military norm even for non-NATO nations such as Australia and New Zealand; however, the interoperability problem is different. Admiral Eriksen continued by arguing that "…our efforts to achieve interoperability in NATO do not attract attention, either from political or from military leaders, and are often criticized as inadequate.[48] This is a common problem, not only within NATO, but within national militaries as well.

Interoperability is not easy and requires willing partners. Efforts are often counter-productive because, as seen by the multitude of definitions, interoperability does not necessarily mean the same thing for everyone. The first step therefore is to agree to a "standard" definition or end-state. Interoperability in a military setting is even more complicated because, among other things, the levels of war and the many attributes. For that reason, before this paper identifies the interoperability challenges specific to the

[47] The European Institute, available from http://www.europeaninstitute.org/Summer-2002/common-nato-standards-will-be-vital-in-future-conflicts.html; Internet; accessed 5 March 2010.

[48] *Ibid.*

Canadian military, the next chapter will first look at military interoperability as a whole. This will be done by reviewing the dimensions of interoperability as put forward by Michael Codner in his 2003 Whitehall Paper.

CHAPTER 3: MILITARY INTEROPERABILITY

Before looking at the CF-specific interoperability challenges, it is important to first understand military interoperability and its various aspects. The previous chapter focused on the definition(s) of interoperability and identified one of the challenge; the definition itself. In their 2002 paper, Middlemiss and Stairs also indicated that defining interoperability was not as straight forward as one would expect:

> Like many of the common concepts of military discourse, the word interoperability seems relatively straightforward in principle, but its practical implications, if not carefully delineated, can be disarmingly – and confusingly – ambiguous. In the real world, moreover, they can be immensely difficult to put into practical effect.[49]

They also noted that the standard military definition; the one used by the military establishments of the NATO allies, including Canada, points to the fact that the concept of interoperability has both technical and operational dimensions, both of which must be in place if interoperability among coalition militaries is to be fully achieved.[50]
They continue by stating that "a bewildering array of other military terms that can be used synonymously (and often confusingly) with the interoperability concept; among them compatibility, interchangeability, commonality and standardization."[51] As stated earlier, this lack of common understanding of what it means to be interoperable; especially within a military environment, is a problem. To provide a baseline from which this paper can expand on the CF interoperability challenges, this chapter will review the dimensions of interoperability.

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[49] Middlemiss and Stairs, *The Canadian Forces and the Doctrine of Interoperability*…, 11.

[50] National Research Council, Committee to Review DOD Plans and Programs. "Realizing the Potential of C4I: Fundamental Challenges. (Washington, DC: National Academy Press, 1999), Chap 2, p. 1

[51] Middlemiss and Stairs, *The Canadian Forces and the Doctrine of Interoperability*…, 11.

Background

Similarly to Middlemiss and Stairs, Michael Codner uses NATO as the "military standard" definition for interoperability[52] and like them, he points out that although adequate as a basis for further analysis, "the use of expressions such as 'systems' and 'services' tends to emphasis the technological aspects of interoperability and to downplay cultural and doctrinal aspects."[53] Interoperability is by no means exclusively a military concept, and as seen in the previous chapter, many non-military definitions exist. However, these general definitions normally do not reflect the multi-disciplinary nature of the military. In a speech to a conference celebrating NATO's 50th Anniversary, former NATO Secretary General Lord George Robertson stated that: "In the context of NATO's Defence Capabilities Initiative (DCI) interoperability may be said to be one of the 'family of abilities' that characterise what is required of armed forces."[54] The other qualities he mentioned as members of this family are deployability, flexibility, sustainability, mobility, and survivability.[55] This places interoperability in a practical and functional context as one of a number of requirements for effective intervention operations in response to security concerns of the future.[56] Therefore, successful intervention in a coalition context, which is likely to be the most testing challenge faced by NATO nations, will require interoperable forces. More to the point, interoperability differs from the other 'abilities' listed by Lord Robertson as it is not a discrete concept and is a key

[52] Michael Codner, "Hanging Together: Military Interoperability in an Era of Technological Innovation". The Royal United Services Institute for Defence Studies, Whitewall Paper 56. (London: UK, 2003), 29.

[53] *Ibid.*

[54] At the Royal United Services Institute on 10 March 1999. Quoted in Michael Codner, "Hanging Together: Military Interoperability in an Era of Technological Innovation".

[55] *Ibid.*

[56] Michael Codner, *Hanging Together*…29.

enabler in all of the others. Firstly, the deployability of coalition forces can be enhanced by the interoperability achieved through training. The movement of forces into theatre and mobility within that theatre can also be improved by the interoperable use of strategic, operational and tactical lift. Flexibility can improve if a Common Operational Picture as a product of intelligence, surveillance and reconnaissance can be produced. Sustainability is enhanced by the rationalization afforded by shared logistics (logistic interoperability) and survivability by the protection that one force, formation or unit can provide to another, particularly if unique protective capabilities are provided and if they have the necessary interoperability.[57]

Dimensions of Interoperability

This quick look at interoperability in a military context shows that it is a multidimensional concept and that many different types of interoperability exist. Codner groups these various types of interoperability into four dimensions: organizational, behavioural, logistical and technical (figure 1). The organizational dimension includes the "actors**"** among whom interoperability is attempted or achieved and the "levels" (levels of war) where it is attempted or achieved. Under the behavioural dimension are the types of interoperability that relate to perception and action. These include doctrinal and cultural interoperability both of which are influenced by constitutional, legal and customary factors. Finally, the other two can be described with reference to the services that are provided for which interoperability is required, specifically technical and logistic interoperability.

[57] *Ibid*,. 30.

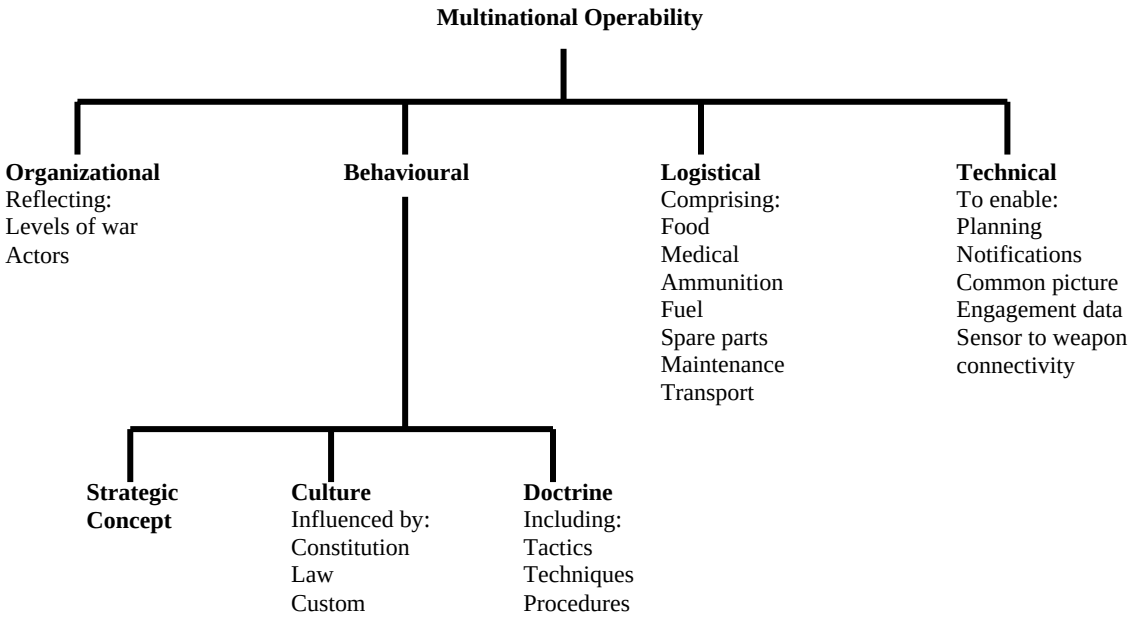

Figure 1 – Dimensions of Multinational Interoperability
Source: Codner, Hanging Together, 31.

Michael Codner concludes that "if one is to describe two headquarters, forces, formations or units as interoperable, one must have satisfied oneself as to their interoperability with respect to all of these dimensions."[58] Therefore, fully interoperable military forces require more than just being able to successfully exchange data (technical interoperability). To be considered interoperable, every dimension is required but the question that remains is to what degree do the systems which constitute each dimension need to be interoperable? Are there degrees of interoperability?

[58] *Ibid.*

Degrees of Interoperability

Within NATO, the aim of interoperability is "to enhance operational effectiveness and improve efficiency in the use of available resources."[59] Codner argues that this aim implies that there are degrees of interoperability, but he admits that there is not a clear threshold that defines the levels of which forces or systems are interoperable. However, he contends that there is a clear relationship between interoperability level and operational effectiveness. As a guideline however, NATO produced a scale of interoperability, which details a framework by which the level of interoperability between organizations can be defined as a function of capability. Organizations with an interoperability level of zero would be considered completely independent organizations, while those with an interoperability level of four would be considered to be fully integrated, and could operate as a single organization.

Table 3.1 – NATO Interoperability Maturity Levels

Level	The NATO scale of interoperability[60]
4	Seamless interoperability across all areas: Command and Control, rules of engagement (ROE), logistics, full intelligence sharing.
3	Full cooperation in operations and logistics. Combined force for a common mission. Common or comparable ROE mutually agreed upon by a higher command authority. Possible authorization of combined operations with a single operational commander.
2	Includes mutual reinforcement of forces, by either temporary attachment or close support. Sharing tactical control allowed. ROE must be close.
1	Operations are coordinated to optimize operational efficiency for the interests of both parties, via geographic division of areas of operations into zones of national responsibilities or by a functional division of warfare areas according to capabilities, or a combination of the two. Possible exchange of ROE. Common tactical surveillance picture possible.
0	Forces operate independently. Exchange of information extends to movement and intentions of forces, operations in progress, and potentially threatening activities of other nations, and includes special-interest maritime traffic.

Source: Kenneth Gause et al, U.S. Navy Interoperability with its High-End Allies, 41.

[59] NATO, Allied Administrative Publication 6.

[60] Kenneth Gause et al, *U.S. Navy Interoperability with its High-End Allies* …, 41.

There are therefore degrees of interoperability and a military organization could arguably aim to be 'more or less' interoperable based on its national policies and/or doctrines. However, one expects that at certain levels of interoperability there would be synergies achieved and improvements in effectiveness that would provide the incentive to obtain the highest possible level of interoperability. Although it is easy to appreciate the benefits of high level interoperability, achieving the dimensions (shown in Figure 1), at all three levels of war, is a monumental task Assuming similar national values and culture supported by analogous political systems, to be interoperable at the strategic level might be fairly simple, however, as Codner argues, it gets more difficult at the lower levels. He states that "in the context of major war the levels of war bear some relation to the echelonment of forces, in particular of ground forces."[61] Traditionally the divisional level – the generally accepted boundary between tactical and operational – has been considered the lowest practical level at which integration of multinational ground forces can be achieved. Interoperability was therefore an operational level concern.[62] However the trend in operations is increasingly in favour of integration at lower levels. A multinational peacekeeping force may be composed of battalions (or even smaller units) of different nations. From his study of organizational interoperability Codner derived four principles governing interoperability at the various levels of war:

1. The lower the Level of War the more difficult interoperability becomes. Forces of different nations operating at the operational and tactical levels completely independently may pursue a common purpose at the grand strategic level relatively easily. Integration of operational level commands is easier to achieve than the full integration of tactical units and formations of different nations into what is effectively a single fighting force.

[61] Michael Codner, *Hanging Together*…,33.

[62] *Ibid.*

2. Combat not surprisingly places demands on interoperability. The higher the likelihood of combat during an operation and the more intense the level of fighting, the greater the requirement for a high degree of interoperability, therefore the higher the level of war and of echelonment at which interoperability can be achieved. Battalions of different nations may conduct traditional peacekeeping but interoperability in the ground operation of the Gulf War was only attempted at the divisional level.

3. The distinctions between the Levels of War will be blurred for two reasons. First, developments in information technology, in particular options that it provides for network centric activities, will tend to blur the distinctions between the three levels. If units at very low levels of echelonment can be integrated electronically into and contribute to a common system that can among other things allow for the wide dissemination of operational level information, there is likely to be a delayering of command structures. Secondly, future operations especially in response to complex emergencies will be conducted in a very sensitive political and diplomatic environment. Actions by units at low levels of echelonment will be politically and strategically significant. There will be a political requirement for adequate purview and control which will have a tendency to short circuit intermediate levels of command particularly if these do not obviously add value.

4. Ground forces interoperability is harder. Evidence from practice shows that multinational interoperability is most difficult to achieve among ground forces and easiest in the widest range of circumstances among naval forces.[63]

Military interoperability is extremely difficult because of the many dimensions present in a military context. NATO has recently adopted the term "operational interoperability," which recognizes that interoperability is not limited to the narrow technical dimension of simply tying systems together to exchange data, but also involves the ability of coalition partners to share information, create a shared understanding of the situation, collaborate on the development and selection of courses of action, communicate these to all forces or units, and allow forces to work together effectively.[64]

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[63] *Ibid.*

[64] Kenneth Gause et al, *U.S. Navy Interoperability with its High-End Allies …*, 2.

Many facets such as doctrine, organizations, weapons, and equipment impact on the interoperability of forces. The equally important concept, unity of effort, ensures that all means are directed to a common purpose. Normally a clearly defined, commonly accepted, attainable objective is required to achieve unity of effort.[65] Often considered within the narrow context of weapons, communications systems, and tactical procedures, interoperability has been a key consideration in the conduct of CF operations for decades through our alliance commitments with the US and NATO as well as our various UN commitments. For the CF interoperability has been and will continue to be a must and since the end of WWII and throughout the Cold War, the Canadian military has tried to be interoperable with its key allies using NATO as an enabler. Despite all of the difficulties in making a military force interoperable with another, the CF has been fairly successful achieving interoperability with the US military, but why and is it enough? The next chapter will explore the CF interoperability challenges, will look at the CF priorities and will discuss the issue of Combined versus Joint.

[65] Hug, G, Colonel. *Interoperability – The Challenge in 2010*. available from http://vcds.mil.ca/dgsp/pubs/reppub/analysis/challenge/intro_e.asp; Internet; accessed 2 October 2010.

CHAPTER 4: INTEROPERABILITY FOR THE CF

As seen in the previous chapter, military interoperability is extremely challenging to achieve; especially for two militaries to be fully interoperable in every dimension. Yet this is what the Canadian military has tried to achieve over the last few decades; to maximize interoperability with the US military. Every Canadian high-level document from the 1994 White Paper to the 2009 CFDS stress the need to be able to work effectively within a coalition and more specifically with the US military. This is not surprising since historically Canada has always fought within a coalition. Desmond Morton has described Canada as "a country that has never fought a foreign war outside an alliance,"[66] and Douglas Bland further expanded upon this theme when he stated that "interoperability is as Canadian as a beaver."[67] Canada has always operated alongside a more powerful partner; an ally with whom Canada shares similar national interests and values. This cooperation with a strong partner has also allowed Canada to assert influence on the international stage through its powerful friend. From Confederation to the early 20th century that partner was Great Britain, but with World War II came the transfer of dominant western geopolitical power status from Britain to the US and concurrently, Canada began the transition to a new senior partner.[68] Since then, the

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[66] Desmond Morton, "Interoperability and Its Consequences", in *The Canadian Forces and Interoperability: Panacea or Perdition?*, ed. Ann L. Griffiths, (Dalhousie University Centre for Foreign Policy Studies, 2002), 160.

[67] Douglas L. Bland, "Military Interoperability: As Canadian as a Beaver", in *The Canadian Forces and Interoperability: Panacea or Perdition?*, ed. Ann L. Griffiths, (Dalhousie University Centre for Foreign Policy Studies, 2002), 51.

[68] Paul Maddison. "The Canadian Navy's Drive for Trust and Technology in Network-Centric Coalitions: Riding Comfortably Alongside, or Losing Ground in a Stern Chase?" (Toronto: Canadian Forces College Advanced Military Studies Course Paper, 2004).

Canadian military, through bi-lateral (NORAD) and multi-lateral (NATO) agreements, has tried to become and to remain interoperable with key allies, but with highest priority given to the US.

CF Priorities

The CF definition for interoperability is "the ability to operate in synergy in the execution of assigned tasks."[69] Although this definition does not speak of coalition operations, it is implied. As stated earlier, the Canadian military has always operated alongside allies and Douglas Bland argues that this *modus operandi* is explicitly linked to Canadian foreign policy, "acting through coalitions is a defining and traditional characteristic of Canadian foreign policy."[70] Hugh Segal, in *Geopolitical Integrity*, argues that the doctrine of interoperability is a strategy that is perfect for a country like Canada. Such a strategy allows a "lesser power" to have its "own discernable impact and visibility in theatres of combat by enabling them to make focused contributions in ways that complement the resources of their allies, most of all those of the United States."[71] Interoperability is a way for Canada to make a difference if it wants to engage its military in global affairs. Over the last 60 years, coalition operations has been a part of almost every conflict; certainly the operations involving Western militaries. In fact, according to Stephen Cimbala, even WWII was a battle of coalitions:

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[69] Department of National Defence, Defence Terminology Bank

[70] Douglas Bland. "Canada and Military Coalitions: Where, How and with Whom?" The Institute for Research on Public Policy (IRPP) 2002.

[71] Hugh Segal, "Geopolitical Integrity" The Institute for Research on Public Policy (IRPP) 2005.

> The Normandy invasion demanded of US, Canadian and British commanders a commitment to intelligence sharing, cooperative planning, and combined execution of operations on a scale without precedent.[72]

So coalition operation is not new and Canada, as a middle power, should pursue a doctrine of interoperability to allow it to be a player on the international stage. To be able to operate as part of coalition is important, but for the Canadian military, as stated in many high-level documents, the priority is to be able to effectively work with the US military. The Canadian military must pursue a doctrine of interoperability centred on the US military; the world's most powerful nation.

Although it is understandably the Canadian military's number one priority, the pursuit of interoperability with the US cannot be done to the exclusion of achieving and maintaining interoperability with other key allies such as Great Britain and Australia. For that reason, since the end of WWII, CF members have been involved and actively participated in many interoperability forums such as ABCA, ASIC and NATO. Indeed, various other interoperability forums involving the five-eye community (Canada, US, Great Britain, Australia and New Zealand) work on specific functions with overlapping domains:

a. Combined Communications Electronics Board (CCEB): C4I, primarily land and air;

b. Australia, Canada, New Zealand, United Kingdom, and United States (AUSCANNZUKUS) Naval Command, Control and Communications Organization: naval C3;

c. The Technical Cooperation Program (TTCP): research and development (R&D);

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[72] Stephen J. Cimbala, "The Politics of Interoperability", in *The Canadian Forces and Interoperability: Panacea or Perdition?*, ed. Ann L. Griffiths, (Dalhousie University Centre for Foreign Policy Studies, 2002), 73.

d. ABCA Navy Field Z: one working area of a larger standardization program, concentrating on warship construction, maintenance, and support (currently in abeyance);

e. Quadripartite Combined and Joint Warfare Conference: doctrinal and training interoperability;[73]

Dean Mills asks: "What are the issues and trends facing these organizations today?"[74] he answers that the first striking feature of this partial list of interoperability forums is the amount of attention paid to the topic – so many people labouring so hard, trying to make it all work.[75] Mills asks another key question, "What results have all of these forums achieved?"[76] According to Major General Ferrari, then head of the Office of NATO Standardization, the results have been mixed, with more successes in the operations and procedures areas, and less in the materiel area.[77] One of the problems he identified is that the interoperability work progressed from the bottom up instead of the top down. This meant that the work of the individual forums was not cross-referenced or prioritized through strategic guidance allowing each group to work on what it saw as important and often creating duplication. His statement was directed at working groups within NATO, but the same problem existed at the national level for the forums listed earlier. Programs like ABCA and ASIC were allowed to operate without any real strategic guidance and were creating stove-pipe solutions; there was no joint perspective. The emphasis on combined interoperability coupled with a lack of joint focus will be

[73] Dean S. Mills, *Coalition Interoperability…*

[74] *Ibid.*

[75] *Ibid.*

[76] *Ibid.*

[77] MGen Giovanni Ferrari, "NATO's new Standardization Organization tackles an erstwhile elusive goal", NATO Review, Vol. 43, No. 3 (May 1995), 33.

discussed in the next section, but first it is important to take a look at NATO, one organization responsible for significantly improving interoperability for many western militaries.

Back in 1996, General Klaus Naumann, then Chairman of the NATO Military Committee, stated that "NATO has placed great emphasis on interoperability, expending lots of energy and effort in producing its STANAGs and Administrative Publications over many years."[78] Although many have questioned the need for NATO, especially since the end of the Cold War, interoperability is much greater amongst western militaries because of NATO's work. John Orr, in his response to Middlemiss and Stairs, explains that it is in the tactical area that NATO has had its most visible achievements, working from agreed set of techniques and procedures, the armed forces of the alliance established a high degree of interoperability for the defence of Western Europe. He continues by stating that "the level of interoperability was enhanced when the French withdrew from the integrated military structure in the late 1960s and the alliance acquired English as a common language to complement its other efforts in standardization."[79] As time passed and exercises and staff colleges reinforced the allied (interoperable) doctrine, the term "NATO standard" became universally accepted to the point that it even defined the additives in a cup of coffee.[80] While it is at the tactical level that the most tangible evidence of the impact of interoperability can be found, Orr argues that the most profound impact has been at the operational and particularly the strategic levels.[81] Due to

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[78] General Klaus Naumann, "From cooperation to interoperability", NATO review, Vol. 44, No 4, July 1996, p 1.

[79] John L. Orr, *a Response*…,185.

[80] *Ibid.*

[81] *Ibid.*

national sensitivities, a clear set of procedures were required to establish command arrangements for NATO forces if the Alliance was to effectively operate in an armed conflict. These arrangements evolved over the years and ensured that NATO commanders had sufficient control to execute their military tasks. However, despite the interoperability gains achieved by NATO at every level, Orr states that the withdrawal of Canadian Army and Air Forces from their forward location in Europe, which effectively removed them from positive influence of their daily contact with other NATO force, had a huge impact on the CF.[82] The results as noted by Middlemiss and Stairs, was that when the Canadian CF-18s entered the 1999 Kosovo campaigns they encountered significant interoperability headaches due to their lack of proper communications equipment, targeting pods and precision weapons.[83] Orr maintains that "there is no doubt that these difficulties would have been more urgently highlighted if the CF-18s had been forward deployed to Europe and subjected more frequently to the interoperability demands of [NATO]."[84] In reality, even before the Kosovo campaign NATO had identified serious problems within its standardization process; more specifically with the groups responsible for developing STANAGs. There was a lack of strategic guidance and little or no coordination between those groups and other NATO bodies.[85] To counter these problems, NATO introduced a new Standardization Organization in 1995, designed to give strategic guidance and to coordinate efforts. In other words, NATO felt it was time to provide top-down guidance, coming from senior national representative, to the various

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[82] *Ibid.,* 186.

[83] Middlemiss and Stairs, *The Issues*…, 21.

[84] John L. Orr, *a Response*…,186.

[85] Dean S. Mills, *Coalition Interoperability.*…

groups to avoid duplication of effort, but more importantly, to remove some of the service-specific groups and focus more on the joint problem. This was only the first step in transforming NATO. During the 2002 Prague Summit, NATO's military command structure was reorganized. One Strategic Command would be responsible for NATO's operations – Allied Command Operations (ACO), and the other would be focused on transforming NATO – Allied Command Transformation (ACT). ACT's tasks include training and education, concept development, comprehensive approach, experimentation, and research and technology and using NATO's ongoing operations and work with the NATO Response Force to improve the military effectiveness of the Alliance.[86] NATO therefore, is now focused on removing the service stove-pipes and is working towards becoming an organization that can better operate at the joint level.

NATO has been focused on jointness since 2002, which should not be that surprising since the military alliance is not limited to a single service. However, even ABCA, a purely Army-centric program at the onset, has gone through an internal transformation to include a more joint approach. Although not a formal alliance, ABCA has become an interoperability standard-bearer focused on the challenges associated with the current operating environment. ABCA evolved from a WWII coalition, a security relationship between the US and her Anglo-Saxon allies based on common culture, historical experience and language. ABCA has been fairly successful in producing Cold War era tactical standards, but not surprisingly, given the peculiar nature of multinational arrangements, standardization and interoperability have been hit-and-miss among the

[86] NATO, available from http://www.act.nato.int/content.asp?pageid=240 Internet; accessed on 5 April 2010.

ABCA armies.[87] One of the new challenges facing the ABCA program is the increased need to be interoperable at the Joint level and since the program was designed to address Army issues primarily it needed a new focus. In June 2002, the ABCA executive Council concluded that "the new conditions and circumstances of our rapidly changing strategic and operational environment had outstripped the program's culture, structure, procedures, and practices."[88] It was time to revitalize the organization and respond to new global security requirements. After examining the new international security environment, a special working group concluded that:

> …the extensive range of threats requires ABCA armies to address those areas where it can achieve significant advances in interoperability…rather than allocating scarce resources to an expansive range of areas that may only achieve minimal outcomes.[89]

This statement is significant in that it identifies the requirement for the ABCA armies to concentrate on interoperability in order to maximize its resources and it also amplifies the need for a more focussed approach. The same working group developed a new vision statement for the program with emphasis on jointness. The new mission seeks to optimize interoperability through collaboration and standardization to achieve effective integration of the armies' capabilities in a joint environment.[90] The ABCA program was useful in providing Canada's Army with a forum where standards could be developed and implemented for those nations. However ABCA does not address similar issues for the Navy or the Air Force.

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[87] General Richard A. Cody, "Note to file – Coalition Interoperability: ABCA's New Focus" in Canadian Army Journal Vol. 10, Issue 1, Spring 2007, 86.

[88] *Ibid.,* 87.

[89] ABCA Special Working Group Program Review, "A Strategic Assessment of the Security Environment," 2 May 2003, C-21.

[90] *Ibid.*

The Canadian Air Force has relied heavily on NATO standards, but like the Canadian Army, is also part of a multinational standardization organization. The Air Force equivalent to the ABCA program is the ASIC, which includes the same member countries as ABCA and also strives to maximize interoperability between those nations. It recently changed its mission statement, which now reads "enhance current and future Air and Space warfighting capabilities through joint and coalition interoperability."[91] These changes signal that other nations, Canada's key allies, have now realized the need to not only be interoperable at the combined level, but also at the joint level. NATO, a multi-service alliance, but also single-service forums such as ABCA and ASIC, are now working on interoperability at the joint level. Is the CF moving in the same direction? Should the CF focus on combined or joint interoperability?[92]

Combined or Joint

The Canadian Government has mandated that the Canadian military must strive to be interoperable with the US military and other key allies to allow the CF to effectively operate as part of a coalition. But to be interoperable at the Combined level does not guarantee a similar capability at the Joint level. According to Allan English, a lack of serious study of the operational art has led to the creation of some serious myths within the CF, and one of these is the fascination with the idea of "joint":

> …one of those myths, that has become a mantra to some in the CF today, is shat "everything is joint". This expression is used by them to justify their belief that every activity of the CF does, from operations to planning to Professional Military Education (PME), must be considered in a joint context. For example, it has been

[91] Air and Space Interoperability Council, Frequently Asked Questions; available from http://www.dtic.mil/asic/ASIC_FAQs.pdf; Internet; accessed 6 March 2010.

[92] Department of National Defence, B-GJ-005-300/FP-000 Canadian Forces Operations (Ottawa: DND Canada, 2005), GL-3 & GL-6.

> argued that all doctrine needs to be joint or that all PME activities must be taught a joint environment. This philosophy runs counter to the joint philosophy of US forces… The American view of jointness is that each service brings its capabilities to the joint planning table and that the necessary capabilities are then selected and integrated into the joint plan. Therefore, only at the operational level and above does real jointness exist in the sense of integrating and synchronizing service (or environment in Canadian parlance) capabilities.[93]

What Allan English is describing is that despite the joint parlay, the CF is not a joint organization in the true meaning of the term, but what is "joint operations"? Lieutenant Colonel Ploughman, in *The Road to Jointness* defined true joint operations as being conducted by two or more services (environments in Canadian terminology) in cooperation with each other. He adds that normally this would involve units or formations of at least two services working together under a single operational (versus administrative) headquarters to achieve a common military objective.[94] The CF Operational Planning Process manual expands on that definition:

> … truly joint operations allow the complete spectrum of joint capabilities to be available to engage an opponent across the spectrum of his forces. Thus land, maritime, aerospace, special operations, psychological operations and civil-military capabilities can be employed synergistically against an opponent sequentially and concurrently in the most effective and most efficient manner.[95]

Given the CF's recent deployment history as well as the Canadian government's latest strategic guideline, it is reasonable to assume that the CF will be participating in coalition operations for the foreseeable future. However, both Colonel Boomer and Richard Gimblett argue that the Canadian focus should be on combined operations in

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[93] English Allan, "The Operational Art: Theory, Practice, any Implications for thehture", (Toronto, Canadian Forces College, March 2003), 50.

[94] Bruce Ploughman, *The Road to Jointness*…, 10.

[95] Department of National Defence, B-GJ-005-500/FP-000 *CF Operational Planning Process* (Ottawa: DND Canada, 6 November 2002), 2-8.

these coalitions.[96] Boomer asserts that interoperability is the key, suggesting that a preoccupation with all things joint would be to the detriment of interoperability with Canada's allies. Gimblett contends that the CF's historical strength lies in combined operations and that it has never "…had to operate in battle jointly as an independent force..."[97] Ploughman does not agree with their argument and maintains that "it is interoperability with Canada's allies that drives the CF to being more joint in coalition operations. Rather than being mutually exclusive, as suggested by Boomer, the concepts are inexorably linked.[98] In the aftermath of Goldwater-Nichols, post-Cold War fiscal restraint and the many hard lessons learned throughout the nineties (especially Desert Storm and Allied Force), "the U.S. Forces have made great strides in joint warfare."[99] If the CF wants to function effectively in coalitions led by the US, then it also must advance its skill set in joint warfare. There is a danger in not achieving the adequate level of interoperability; Robert Ricassi states that "Coalitions by their very nature can impede the operational art and manoeuvre – disparate ROE, national caveats, capability gaps and language barriers are all potential sources of friction."[100] Joint operations are becoming more complex, as additional warfare capabilities, such as Information Operations and Special Operations evolve. On a more basic level for Canada, Ploughman asks: "if the

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[96] Colonel M.F. Boomer, "Joint or Combined Doctrine: The Right Choice for Canada" (Toronto: Canadian Forces College Advanced Military Studies Course Paper, 1998), 11. See also Richard Gimblett, "The Canadian Way of War: Experiences and Principles." *From Intervention and Engagement: A Maritime Perspective* (Halifax: Centre for Foreign Policy Studies, Dalhousie University, 2003), 336.

[97] Gimblett, *The Canadian Way of War: Experiences and Principles…*, 336.

[98] Bruce Ploughman, *The Road to Jointness…*, 10.

[99] Colonel T. Brandl, "Building a Joint Task Force Headquarters" (lecture, Canadian Forces College, Toronto, ON, September 16, 2005).

[100] Robert Ricassi, "Principles for Coalition Warfare," *Joint Forces Quarterly*, no.1 (Summer 1993), 62.

Army, Navy, Air Force and Special Forces can't routinely work together, how can the CF expect to succeed in the complex world of coalition operations?"[101]

Gimblett focuses on historical and larger conflicts, in this context he is correct in stating that the CF's participation has invariably been combined. However, Ploughman points out that in view of the IPS, with its focus on action in failed and failing states becoming the routine, it is a not a leap in logic to suggest that Canada will be acting independently in a joint context in the future.[102] The IPS sets the stage for CF participation in coalition of the willing, "At the same time, consistent with international legal norms, when the will of the international community is clear, we [Canada] will also consider participating in less formal coalitions of like-minded states, as we have seen in the international campaign against terrorism."[103] It is conceivable therefore that the CF could operate as a subordinate Joint Task Force (JTF) within a larger coalition JTF framework.[104] The IPS also clearly states that Canada may have to "go it alone", reinforcing the idea that elements of the Army, Navy and Air Force could be deployed independently under Canadian command. This, in fact, is the principle upon which the Standing Contingency Task Force (SCTF) - a new formation in the DPS – is based.[105]

There are other reasons why Canada needs to focus on jointness. As stated earlier, Canada seeks to increase and strengthen its influence on the world scene and the Canadian government often uses the CF for that purpose. Ploughman argues that

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[101] Bruce Ploughman, *The Road to Jointness…*, 11.

[102] *Ibid.*

[103] Department of National Defence, Canada's International Policy Statement: A Role of Pride and Influence in the World – Defence. (Ottawa: Canada Communications Group, 2005), 24.

[104] Department of National Defence, *Defence Policy Statement.*

[105] Department of National Defence, *Defence Policy Statement.*

"notwithstanding her position as a middle power, [Canada] must be capable of assuming command roles and lead nation status where possible in order to generate and maximize this influence."[106] He adds that merely providing forces to a component command within the Combined Joint Task Force structure, while of some use on the diplomatic front, is potentially of a lower order of magnitude from an influence standpoint.[107] Thus the CF must be better at working at the joint level and one key enabler is increased interoperability between the environments, otherwise it risks not being offered command roles and potentially failing as a lead nation; both of these outcomes would significantly erode Canada's potential influence. As observed by Colonel Desjardin:

> …not being proficient at joint operations could very well consign the CF to minor roles, as small single-element components in coalitions led by other nations, or to operations at the low-end of the conflict spectrum. Driving towards more jointness would appear to be a vital concern if the CF is to retain a substantial measure of autonomy and remain a worthy partner on the international military scene.[108]

More jointness would also provide for better effectiveness in domestic operations. The Canadian military has been involved in supporting other federal departments in events like G8/G20 summits or the winter Olympics. As well, natural disasters like the Winnipeg floods or the 1998 ice storms are examples where a more interoperable force would greatly benefit the CF. While there are obvious and compelling arguments for the CF adopting jointness as its *modus operandi*, how much is achievable given the resource constraints of time, money and trained personnel. In 2005, when discussing CF transformation, General Hillier noted that "the CF is still fundamentally structured along

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[106] Bruce Ploughman, *The Road to Jointness…*, 12

[107] *Ibid.*

[108] Colonel B. Desjardin, "Joint Doctrine for the Canadian Forces: Vital Concern or Hindrance?" (Toronto: Canadian Forces College Advanced Military Studies Course Paper, 1999), 18.

service lines to fight the Cold War."[109] Five years later, after almost a decade of fighting in Afghanistan while continuing with transformation, the CF is no further ahead than it was at that time.

As DND's 2000 *Strategic Capability Planning* document stated: "The capability to work seamlessly with our most important allies in an operational setting ensures that we can participate effectively in those crises most likely to affect our vital interests."[110] This Government of Canada mandate means that the CF must continue to pursue interoperability at the combined level, and although NATO has been an important organization in advancing coalition interoperability, for the CF, the priority remains the US military followed by the other five-eye nations. However, as demonstrated by NATO and single-service interoperability forums like ABCA and ASIC, the Canadian military cannot ignore the joint level. Increase jointness would provide the CF with greater flexibility when operating as part of multinational coalitions with the added bonus of being a more effective force in domestic operations. The CF must strive to be interoperable within both the combined and joint environments and, to be discussed in the next chapter; there is also a need to be more interoperable with other governmental departments as well as public organizations.

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[109] Department of National Defence, Chief of Defence Staff, "The Way Ahead for Our Canadian Forces."

[110] Vice Chief of the Defence Staff, "Glossary for Strategic Capability Planning for the CF," Strategic Capability Planning for the Canadian Forces, (Ottawa: Department of National Defence, June 2000), 8.

CHAPTER 5: NEW CHALLENGES

The previous chapter identified the need for the Canadian military to be able to effectively operate with other militaries, but primarily with the US. Next on the list are the other three five-eye nations (Great Britain, Australia and New Zealand) and then NATO. The CF mandate is to be interoperable at the combined level, but conflicts in the Middle East and other factors have forced NATO as well as other multinational programs like ABCA and ASIC to focus more on the joint level. The CF, as member of these interoperability forums, must also work to be more effective within its own environments. This joint requirement would provide the CF with more flexibility in expeditionary operations, but also increased effectiveness in domestic operations. However, the new security environment brought on by the end of the Cold War and, more specifically, by the events of 11 September 2001 requires the CF and others to work with non-military entities. This chapter will look at the whole of government perspective and the comprehensive approach and investigate the need for the CF to become a JIMP-capable force.

New Environment

The collapse of the Berlin Wall and the end of the Cold War brought with it a new and peaceful era for Canada and the international community. However, it also removed the balance of powers and since then, from a security perspective, the world has become increasingly complex compared to the armed stability of the Cold War. The last twenty years have seen a multitude of intra-state conflicts, failed states as well as the associated human security challenges. The post Cold War paradigm shift required the global

community to intervene in the name of greater international good and stability. As a result, we have seen the "number and size of [CF] missions relative to available forces – tripled [from 1991 and 2005] compared to the period between 1945 and 1989."[111] Canada was called upon to provide military assistance in such locations as the Persian Gulf in 1991, the Former Republic of Yugoslavia, Somalia, Haiti, and Sudan to name but a few. The vast majority of these military operations were conducted within an international multilateral context. That is to say, the CF was deployed as part of a larger coalition operation, involving many of its force structure capabilities in a joint and/or combined constructs. Since 11 September 2001, asymmetric warfare and the Global War on Terrorism (GWOT) have worsened an already difficult and complex military environment, and Canada's involvement in Afghanistan has highlighted the requirement for the CF to work with non-military organizations as well. This new concept, known as whole of government approach, is defined as "one where government actively uses formal and/or informal networks across the different agencies…to coordinate the design and implementation of the range of interventions that government's agencies will be making in order to increase the effectiveness of those interventions in achieving the desired objectives.[112] In December 2007, the CF Chief Review Services (CRS) published its *Evaluation of CF/DND Participation in the Kandahar Provincial Reconstruction Team.*[113] Approximately half of the evaluation is dedicated to studying the concept of "comprehensive approach", which is derived heavily from a whole of

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[111] Canadian Department of Foreign Affairs, Canada's International Policy Statement: A Role of Pride and Influence in the World – Overview (Ottawa: Canada Communications Group, 2005), 11.

[112] Organization for Economic Cooperation and Development report, Whole of Government Approaches to Fragile States, page 15, 2006.

[113] Chief Review Services, Reports and Evaluation, available from http://www.crs.forces.gc.ca/reports-rapports/2007/pdf/138P077-eng.pdf; Internet; accessed 2 April 2010.

government perspective, which calls for bringing previously separate agencies into closer collaboration. The CRS evaluation will be used extensively for this chapter's discussion of the CF and the need for a whole of government approach.

Whole of Government Approach

The CRS evaluation provides a useful historical review of the whole of government approach. In Afghanistan, it argues that this approach to integrated security, governance and reconstruction construct began in November 2001 following the defeat of the Taliban and installation of an interim Afghan Transitional Authority.[114] Unlike previous conflicts where doctrinal US or NATO "stabilization and reconstructions" efforts were implemented, such as had occurred in Bosnia and Kosovo in the 1990's, the Afghanistan mission required a more comprehensive effort. The Afghanistan mission entailed the rebuilding of a country and its institutions at every level, while at the same time conducting an active counterinsurgency campaign. Prior to Afghanistan, the UK had conducted a successful 15-year counterinsurgency campaign in Malaysia with an acknowledged whole of government context that contributed greatly to the success of that campaign.[115] Thirty years earlier, albeit with less success, the US had also introduced an early form of a whole of government approach to the ongoing insurgency in Vietnam. Finally, the UK Malaysian experience, and other counterinsurgency operations over the last sixty years have shown that a successful counterinsurgency campaign usually lasts from 11 to 14 years.[116] The CF must be prepared for these extended operations.

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[114] *Ibid.,* 12.

[115] *Ibid.*

[116] *Ibib.*

When looking at the future of interagency operations from the allies' perspective, the CRS evaluation states that "The literature is replete with testimony to the effect that an interagency approach will increasingly be the norm in order to achieve national unity of effort and integrated effects."[117] For example, in 2000, the US Chairman of the Joint Chiefs of Staff stated in his Vision 2020 that: "…this goal (achieving national objectives) will be achieved through full spectrum dominance – the ability of US forces, operating unilaterally or in combination with multinational and interagency partners, to defeat any adversary and control any situation across the full range of military operations."[118] More recently, the US Army has highlighted the importance of interagency cooperation in the latest version of its counterinsurgency doctrine,[119] and has progressively introduced the acronyms DIME (diplomacy, military, information and economics), PMESII (political, military, economic, social, infrastructure and information systems – also used by the CF in assessing progress in Afghanistan) and MIDLIFE (military, information, diplomacy, law enforcement, intelligence, finance and economics) to reflect the range of complementary interagency functions.[120] The UK describes this concept as a comprehensive approach as indicated by the UK's Chief of the Defence Staff, Air Chief Marshall Sir Jock Stirrup in a 2007 edition of the RUSI Journal:

> So the situation has arisen where the military alone cannot deliver that (strategic) success, but where equally it cannot be delivered without the military. Hence the need for what is called the 'Comprehensive Approach'; that is, the coordinated

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[117] CRS, *Evaluation*…, 28.

[118] General Henry H Shelton, US Chairman of the Joint Chiefs of Staff, *Vision 2020*, June 2000

[119] US Army/USMC FM 324/MCWP 333.5, *Counterinsurgency* field manual, December 2006

[120] CRS, *Evaluation*…, 28.

> and synergistic application of all lines of development: political, diplomatic, military, legal, economic, social, and so on.[121]

A further example of the broad recognition by Canada's allies of the importance of interagency operations is the view of the commander of the French Army's doctrine centre, who noted in June 2007 that "There are many lessons [from overseas deployments], but the first lesson learned is that military force alone is rarely able to fulfill the political objectives for the deployment. You have to combine civil and military actions."[122] Given international acceptance of the importance of the interagency component in full spectrum operations, the CRS evaluation then looked at whether that acceptance is shared by the CF or not. It concludes that "Indications are that the importance has been recognized, and it is now reflected to varying degrees at the strategic, operational and tactical levels."[123] At the highest level within DND, the Minister has linked success in military operations with the interagency approach: "As part of a whole of government approach to defence and security, the Canadian Forces' first priority continues to be success in our operations at home and abroad."[124] This position has been reflected in the CDS's 2007 CF Collective Training Strategy, which noted that "an interagency approach to operations is required to ensure that all national "forces" are coordinated to produce integrated effects."[125] At the Environmental level, the Army shares this recognition as it force-generates the Army of Tomorrow. As

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[121] Air Chief Marshall Jock Stirrup, UK Chief of the Defence Staff, *British Defence in a Changing World*, RUSI Journal, Vol 152, No 1, pp 2025, February 2007.

[122] Brigadier General Vincent Desportes, Commander, French Army's Center for Forces Employment Doctrine, as quoted in Defense Week, 18 June 2007.

[123] CRS, *Evaluation*…, 29.

[124] Minister's Message, DND Report on Plans and Priorities 20072008, page ii.

[125] CF Collective Training and Exercise Guidance 2007, July 2007.

described in the Land Operations 2021 force employment concept, "Given the security environment Canada increasingly confronts, these goals require forces that are combat-effective, but also highly mobile, adaptive, networked, sustainable and capable of operating in a joint, interagency, multinational and public (JIMP) context."[126] Although not a concept embraced by all of the CF environments, JIMP will be further discussed in the next section of this chapter.

The CRS evaluation argues that from the foregoing it is clear that interagency operations are expected to be among the most prominent CF international missions for the foreseeable future. It defines the CF's role in such cases to be primarily as "an enabler, providing a secure environment for others (i.e., OGDs, NGOs, etc) to accomplish their mission, as well as assisting with humanitarian, reconstruction and governance efforts where required."[127] From a military perspective, interagency units are also important contributors to intelligence gathering and the information operations campaign, communicating Canadian (or alliance/coalition) messages to the local population, while negating the influence of adversaries. The evaluation warns that while the CF has embraced most of the concepts of a whole of government approach in stabilization and reconstruction operations, "acceptance must be followed by building CF capacity and addressing gaps in a number of areas that are discussed hereunder."[128] In other words, the CF must ensure it can work effectively with its whole of government partners and one of the key enabler will be interoperability.

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[126] B-GL-310-001/AG-001, Land Operations 2021: The Force Employment Concept for Canada's Army of Tomorrow, 2007.

[127] CRS, *Evaluation*…, 30.

[128] *Ibid.*

The CRS evaluation finds that "There is currently no CF/DND OPI assigned to coordinate the translation of broad grand-strategic objectives into definable interagency tasks and performance metrics as they relate to international operations and to track and report progress toward their achievement."[129] It recommends that a strategic level OPI be assigned to "coordinate CF/DND involvement in future interagency operations, to include analysis of available military options to support the achievement of grand-strategic objectives."[130] In early 2007 US Army General David Petraeus noted to the Senate Armed Services Committee the vital need for interagency doctrine.[131] A similar need for CF interagency doctrine was highlighted back in 2003, by Col G Hug, the Special Assistant to the DCDS:

> There is no overarching interagency doctrine that delineates or dictates the relationship and procedures governing all agencies, departments and the military. Unity of effort can only be achieved through close, continuous coordination and cooperation to overcome confusion over objectives, inadequate structure or procedures, and bureaucratic and personal limitations. Action will follow understanding.[132]

In addition to high-level strategy development and management, there is a need for the CF to take a systematic approach to interagency operations, to include assigning CF OPIs with responsibility for coordinating interagency mission objectives, concepts, doctrine, performance measurement and lessons learned at the strategic level as well as to ensure the CF can effectively work with its national partners. Interoperability describes the ability to work together to deliver services in a seamless, uniform and efficient manner

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[129] CRS, *Evaluation*…, 32.

[130] *Ibid.*

[131] Gen David H. Petraeus, written response to an advance policy question posed by the US Senate Armed Services Committee, January 2007, available from http://armedservices.senate.gov/statemnt/2007/January/Petraeus%20012307.pdf Internet; accessed 2 December 2010.

[132] Col G. Hug, *Interoperability – The Challenge in 2010*…, 2.

across multiple organizations and information technology systems. Promoting interoperability between agencies is critical to achieving whole of government collaboration.

JIMP

As mentioned earlier, the Canadian Army has embraced the comprehensive approach, but despite interest in the comprehensive approach to operations, a detailed CF policy statement on the subject has yet to emerge. The Army's focus is toward a JIMP-capable force which offers the means of operationalizing a comprehensive approach to operations. In an article for the Canadian Military Journal, Lieutenant-General Andrew Leslie, then Commander of the Army, states that "In fact, the aim of a JIMP-enabled force is to nest clearly within both the comprehensive, and, by extension, the whole of government approaches."[133]

In essence, the term JIMP is a descriptor that identifies the various categories of players (i.e. organizations, interest groups, institutions) that inhabit the broad environment within which military operations take place. Leslie *et al* argue that "to be JIMP-capable entails the adoption of an approach to operations – both domestic and international – that allows such players to interact effectively."[134] Most importantly, it involves a belief in the requirement to adopt a comprehensive approach to problem solving that involves the holistic consideration, and, ideally, the coordination of all

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[133] LGen A. Leslie, Peter Gizewski and LCol M. Rostek, *Developing a Comprehensive Approach to Canadian Forces Operations*, in Canadian Miliatry Journal, Vol 9, No 1. available from http://www.journal.forces.gc.ca/vo9/no1/04-leslie-eng.asp Internet; accessed on 3 April 2010.

[134] Leslie *et al*, *Developing a Comprehensive approach*…, 14.

relevant players.[135] A JIMP-capable organization involves both the development of a framework identifying key players and capabilities allowing for effective collaboration with those identified. Therefore, a JIMP-capable force would interact with players in the following four domains:

a. Joint: involving other national military elements and support organizations;

b. Interagency: involving other government departments (OGDs) and other government agencies (OGAs), both domestic and foreign. These agencies will include host nation government departments to include security forces, government departments and agencies from support nations, and international government bodies, such as UN agencies;

c. Multinational: involving one or more allies or international coalition partners; and

d. Public: involving a variety of elements, and including domestic and international societies, consisting of, in part, host nation populations, media agencies, non-governmental organizations (NGOs), public volunteer organizations (PVOs), international organizations (IOs), and commercial interests involved in reconstruction and/or development programs, and private security firms recruited to support the government.[136]

Much like the whole of government and comprehensive approaches that it attempts to emulate and operationalize, the JIMP concept calls for the development of a capacity to interact with a particularly wide range of organizations and groups in pursuit of objectives. As seen from the above definitions, this requires involvement and interaction with the organizations and agencies of governments, but also with private groups, publics, and non-governmental organizations and agencies. While this may

[135] *Ibid.*

[136] *Ibid.*

increase the difficulty of achieving a fully JIMP-enabled force, Leslie *et al* argue that "it is ever more essential, given the context in which [CF] operations now take place."[137]

They continue by stating that "indeed, these latter 'unofficial' entities often form an important component" and that experiences in Bosnia, Kosovo, and Afghanistan amply attest to that fact.

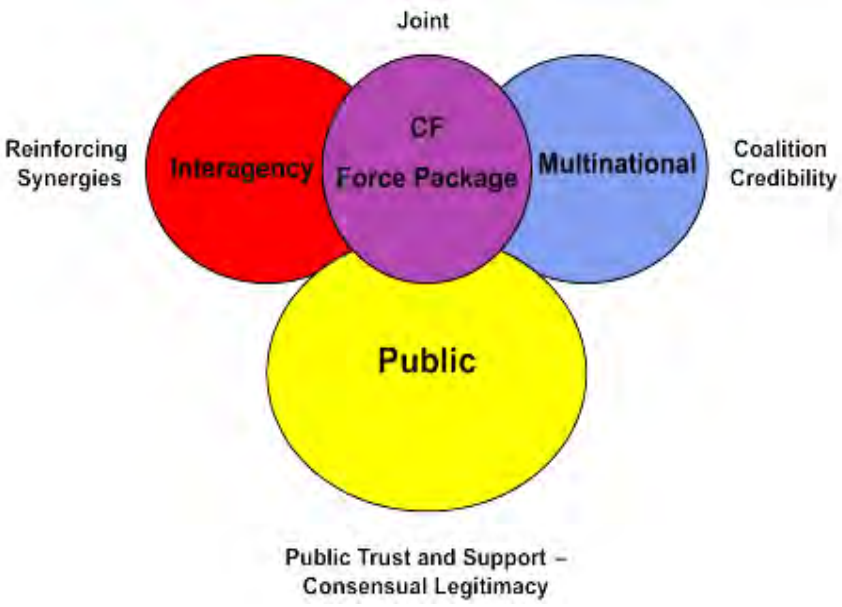

Figure 2 – Joint Interagency Multinational Public
Source: Leslie *et al*, Developing a Comprehensive approach, 15.

When broken down into its component parts, it is clear that the ideas behind JIMP are not particularly novel. As discussed in the previous chapters, the Joint and Multinational (combined) aspects of JIMP are already well established – both within the Continental General Staff System and in the Canadian practice of staff responsibilities.[138]

[137] *Ibid.*, 15.

[138] Department of National Defence, *Land Force – Command*, B-GL-300-003/FP-000, 1996, p. 70.

While the interagency and public components pose greater challenges – most notably in terms of interfacing with entities that are essentially non-military in nature and that have well-established cultures – Leslie *and al* point out that some experience is nonetheless resident in past Civil Military Coordination (CIMIC) practice.[139] CIMIC therefore can provide a foundation from which the JIMP concept, particularly the interagency and public components, can evolve.

In complex contemporary crises, activities and effects from a wide range of government participants need to be coordinated. The CFJP 01 describes the CF contribution to this Canadian whole of government approach as one that "identifies an effects-based philosophy in seeking to stimulate, wherever possible, a cooperative culture and collaborative working environment between government departments and agencies."[140] It continues by stating that within this philosophy, "participants work proactively and share their understanding of situations and conduct planning and activities on the basis of shared favourable outcomes in the short, medium, and long term."[141] A whole of government approach needs to be incorporated into the emerging thought on comprehensive approach to operations which includes actors beyond government, such as NGOs, local populations, and others who conduct activities and pursue objectives that have a bearing on the overall outcome. Although interagency operations to date have been largely Army-oriented, that may not always be the case in

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[139] Leslie *et al*, *Developing a Comprehensive approach*…, 15. Also, for a complete review of CIMIC doctrine, see *Civil-Military Cooperation Tactics, Techniques and Procedures*, B-GL-355-001/FP-001, 2006.

[140] Canadian Military Doctrine, available from http://www.cfd-cdf.forces.gc.ca/websites/Resources/dgfda/Pubs/CF%20Joint%20Doctrine%20Publications/CFJP_%2001_Canadian_Military_Doctrine_En_2009_04.pdf; Internet; accessed on 1 Aril 2010.

[141] *Ibid.*

the future. The opportunity exists to capitalize more fully on the complete range of CF capacity by training and employing Navy and Air Force personnel in interagency roles. It is well established that the CF must be able to effectively operate with other militaries as well as at the joint level, but the current security environment requires the Canadian military to develop the ability to work with non-military organizations. By pursuing a JIMP-capable force, the CF could ensure it can meet future requirements and one key enabler to achieving a JIMP-capable force is interoperability. The CF needs to focus on being interoperable within a military context, but must endeavour to become more interoperable with other national agencies and selected public organizations.

In a 1999 article, Colonel Hug states that "interoperability creates the condition to achieve unity of effort and to simplify planning and execution in alliance or coalition operations."[142] His paper looks at the CF interoperability requirements and discusses the need to work more closely with civilian organizations, but focuses on the Revolution in Military Affairs (RMA) concept. He indicates that "interoperability at all levels can often be achieved for short periods of time, sustaining it consistently will demand a continuous evolution in concepts, doctrine and equipment in concert with those with whom we will operate."[143] He argues that maintaining interoperability through the RMA period will become increasingly challenging. Another impact of the RMA was the requirement to "transform". The next chapter will look at the transformations undertaken by the US military, NATO and finally the CF. It will focus on the impact those transformations had on interoperability and look at where the CF can go next.

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[142] Colonel Hug, *Interoperability – The Challenge in 2010…*, 1.

[143] *Ibid.*

CHAPTER 6: RMA AND TRANSFORMATIONS

> *The potential for revolutionary change and transformation arises from the integration of critical military capabilities across service lines.*[144]
> - Douglas MacGregor, "Transforming Jointly"

The last chapter introduced the whole of government approach and identified the need for the CF to become a JIMP-capable force to meet the current security environment. As discussed earlier the end of the Cold War brought on significant changes for western military forces, particularly those of NATO. These organizations found themselves faced with forces designed for a threat that no longer existed. The following ten years, most of these militaries went through a period of re-evaluation and downsizing as their respective governments attempted to cash-in on the perceived peace dividends associated with this reduced threat. Soon after the dissolution of the Soviet Union the US Army used the term transformation to describe a required change from the Cold War organization to a lighter and more responsive force in order to be ready for the emerging non-traditional threats.[145] At roughly the same time, the ideas of network centric warfare and the associated RMA suggested that military forces were in the midst of a transition from the industrial age to the information age; this transition was also referred to as transformation. Defence planners of the time believed the future of warfare was through increased technical capabilities; precision-guided missiles, increased

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[144] Douglas A. MacGregor. Chapter 8 "Transforming Jointly" in *Transforming America's Military*. Ed. Binnendijk, Hana (Washington. DC: National Defence University Center for Technology and National Security Policy, 2002), 220.

[145] United States General Accounting Office, *Report to Congressional Committees: Military Transformation: Army has a Comprehensive Plan for its Managing Its Transformation but Faces Major Challenges, November 2001*, 7. available from http://www.gao.gov/new.items/d0296.pdf; Internet; accessed 5 April 2010.

surveillance capabilities and advanced weaponry.[146] Indeed many believed that the major victory in the 1991 Gulf War was a direct result of RMA and its application. Hugh Segal argued that because of the belief in the RMA many governments, including Canada's, felt this policy would "radically reduce the need for traditional complements or military expenditures of defence levels."[147] The result is often described as the "decade of darkness" by Canadian defence analysts; with the severe downsizing of the Canadian military that followed, it appears that Segal was correct. Regardless of its origin, whether it was due to the post-Cold War peace dividend or RMA, transformation was the way ahead. This chapter will look at ongoing transformations in NATO, the US and finally the Canadian military. However, because of its impact on transformation, RMA and the associated technological gap will first be reviewed.

RMA and the Technology Gap

In a 1999 report, Dr. Elinor C. Sloan described RMA as a major change in the nature of warfare brought about by "the innovative application of new technologies which, combined with dramatic changes in military doctrine and operational and organizational concepts, fundamentally alter the character and conduct of military operations."[148] The most recent description of the RMA centers on the concept of information dominance, sparked by rapid advances in information technologies and

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[146] Riley Hennessey. "Towards a Larger Footprint: Interoperability in Pursuit of Influence". (Halifax: Dalhousie University press, 2006).

[147] Hugh Segal, "The Canadian-American Defence Relationship; Nostalgia Ain't What is Used to Be," Policy Options (April 2002), 2.

[148] Directorate of Strategic Analysis, "The Defence Capabilities Initiative and US-NATO Relations: Responding to the Revolution in Military Affairs," Research Note 99/07 (Ottawa: DND Canada, 1999), 1.

information processing capabilities.[149] As force enablers, information technologies have the potential to transform traditional elements of military force leading to a decisive advantage in future warfare. Therefore, the CF must adapt to the RMA and more importantly, it must ensure that any technological gap with the US military is identified and rectified when required. In a 2005 paper Lieutenant Colonel Galvin asked if the "notions of a Revolution in Military Affairs and the technology gap between nations was real?"[150] A look at US expenditures compared to that of its allies and other militaries will help answer this question and understand the notable extent to which the US military dominates the rest of the world in technology. The first indictor of dominance is the 79.1 billion dollars the US military budgeted for Research and Development in 2010, which is almost as much as the entire defence budget of its closest military competitor, China.[151] Add to this total an additional 140.8 billion dollars towards capital acquisitions and the technology gap between the US and all other militaries becomes obvious. This disparity is not recent, in fact, compared to the 2002 numbers, it has increased. Figure 3 provides a graphical representation of the spread in military spending between the nations. The overall 2010 budget for the US military is more than the next 14 countries combined; in 2002 that ratio was to the next nine countries.[152]

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[149] Martin Galvin. "Canada's Capability Renewal Opportunities for Innovation and Cooperation." (Toronto: Canadian Forces College Advanced Military Studies Course Paper, 2005), 11.

[150] *Ibid.*, 12.

[151] Stockholm International Peace Research Institute, available from http://www.sipri.org/research/armaments/milex/resultoutput/15majorspenders Internet; accessed on 3 April 2010.

[152] The White House, available from http://www.whitehouse.gov/omb/budget/fy2010/assets/summary.pdf; Internet; accessed on 3 April 2010.

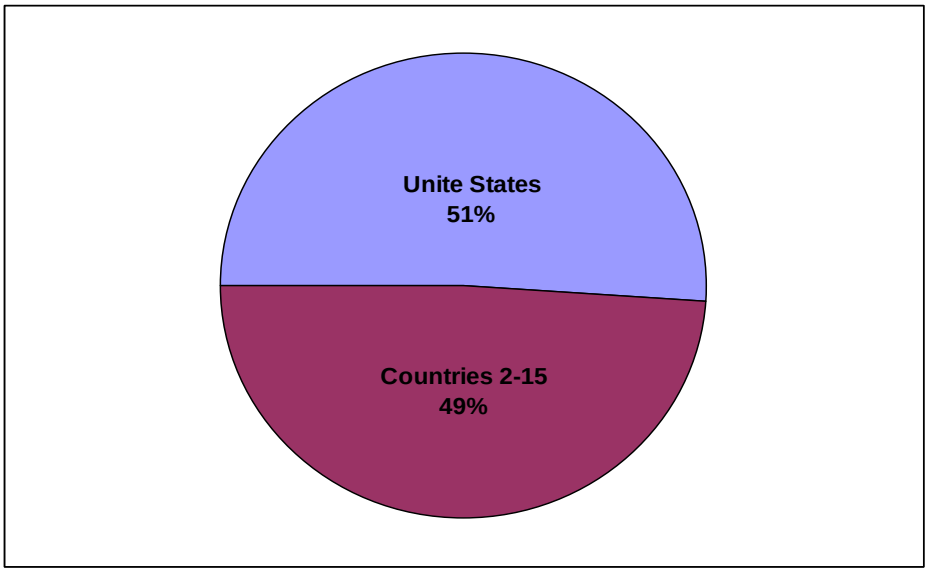

Figure 3 – US Defence Expenditures vs top 15 Defence-Spending Countries, 2010

Of course dollars alone is not the only indication of the technological gap, it can also be measured on the battlefield. The NATO air campaign in Kosovo was expected to last just a few days, yet it went on for two and a half months, revealing key concerns and areas for improvement in the alliance.[153] By most accounts, the air campaign was a great success in that it achieved the principal aims while demonstrating that NATO could respond to a crisis outside of its members' borders and still maintain the integrity of the alliance.[154] A large number of precision-guided munitions were employed in large numbers to accomplish the most precise campaign ever, achieving unprecedented success in the

[153] John Peters *et al*, *European Contributions to Operation Allied Force: Implications for Transatlantic Cooperation*. (Santa Monica: RAND, 2001), xiii.

[154] United States, Department of Defense, *Kosovo: Operation Allied Force After-Action Report*, (Washington, DC: U.S. Government Printing Office, 2000) xvii. The NATO objectives were to: demonstrate the seriousness of NATO's opposition to Belgrade's aggression in the Balkans, deter Milosevic from escalating attacks on helpless civilians, and damage Serbia's capacity to wage war.

reduction of collateral damage and no allied casualties. However, the great majority of these highly accurate weapons were fired by the Americans; most other nations simply did not have that capability and those who did could not guarantee similar results. NATO's campaign against Serbia in Operation Allied Force (OAF) is another example. In fact, OAF exposed gaps in key capability areas essential to combined operations, which lead William Cohen, then the US Defense Secretary, to create his Defense Capability Initiative (DCI), which was eventually adopted by NATO in 1999. Specifically, DCI was to provide a "common operational vision" with the intent to encourage European members of NATO to purchase more sophisticated military equipment. DCI focused "on four core capabilities: Mobility; Effective Engagement; Survivability, and Sustainability."[155] However, DCI never "delivered" as promised and was repackaged in 2002 as the Prague Capabilities Commitment (PCC), which now provides Canada and the other NATO nations the opportunity to take the lead and share assets in a multinational framework of capability defence pools. As stated earlier, the 2002 Prague summit was also critical in that it stirred NATO towards a transformation that brought about the creation of ACO and ACT; the latter responsible to increase jointness within the alliance.

[155] Basic Publications, "A Risk Reduction Strategy for NATO," available from http://basicint.org/pubs/Research/1999riskreduction5.htm; Internet; accessed 3 December 2009.

Transformation

In response to the changing technological and security environments, Canada's principal allies as well as NATO, embarked on defence transformation strategies to develop new military capabilities and increase jointness. In 2004 the Canadian government publicly acknowledged the need for the Canadian military to maintain interoperability with allies:

> Our government's reliance on an international security policy centred on coalition operations means that the Canadian Forces cannot but respond to developments abroad if it is to make any meaningful contribution to international operations.[156]

The US military was already going through its own transformation, so the CF followed suit; in 2005 General Hillier announced that the CF would reorganize. Before looking at CF transformation, it is necessary to first review the US process.

As detailed in 2003 in *Military Transformation: A Strategic Approach*, transformation is a vital component of the US defence strategy. This strategy expresses very clearly what US military transformation is based on and where it is taking their armed forces. The same document identified military transformation as being "at the heart of the new [defense] strategy requiring agile, network-centric forces…that can defeat adversaries swiftly and decisively."[157] The document adds that transformation activities will include "changes to planning, budgeting, acquisition and their personnel management system and will be shaped by realities of competition in the information age

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[156] Paul Mitchell, "A Transformation Agenda for the Canadian Forces: Fall Spectrum Influence," Canadian Military Journal 4, no. 4 (Winter 2003-2004): 62.

[157] United States, Department of Defense, Office of Force Transformation, *Military Transformation: A Strategic Approach.* (Washington, DC: Director, Force Transformation, Office of the Secretary of Defense, 2003) 7.

and the concepts of network-centric warfare."[158] US military transformation is based on four pillars: strengthening joint operations, exploiting US intelligence advantages, concept development and experimentation, and developing transformational capabilities. It has three parts: transforming culture, transforming processes, and transforming capabilities and six operational goals; three are mission oriented: protect critical bases, project and sustain forces, and deny enemy sanctuary; as well as three enabling: leverage information technology, assure information systems, and enhance space capabilities.[159] It also describes US Transformation as:

> … a process that shapes the changing nature of military competition and cooperation through new combinations of concepts, capabilities, people and organizations that exploit our nation's advantages and protect against our asymmetric vulnerabilities to sustain our strategic position, which helps underpin peace and stability in the world.[160]

From this statement, especially the "changing nature of military competition and cooperation", it is clear that this strategy aims to maximize RMA and technological superiority, but also to increase jointness between US services. The US has embarked on a path of transformation in which technology applied jointly is an integral component. Thus, when discussing the potential interoperability with any branch of the US military, one must fully expect that technology will be a significant factor, especially at the tactical level.

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[158] *Ibid.,* 13.

[159] *Ibid.,* 17.

[160] *Ibid.,* 2.

CF Transformation

The technology gap with the US is apparent and growing, but in some respects, Canada has been quite fortunate. As a product of a shared military history, much of the CF's equipment, doctrine and training is similar and interoperable with US forces. Nevertheless, interoperable tactics, techniques and procedures developed out of common defence and security missions thirty to forty years ago are fading as the technological gap increases. Is CF transformation the answer?

As stated earlier, "the US military first identified the implications of the RMA and then went on to discuss how these would be dealt with within their armed services,"[161] at the same time the CF was waiting. Paul Mitchell noted in late 2004 "that Canadian interest in the RMA appears to have been relatively low key."[162] He argued that the US will set the standard for technology, organization and doctrine, and that the CF approach is "to allow these developments to mature and then determine where Canada might be able to fit into them."[163] Since the US is already well on their way to transformation, Canada's approach could be to simply follow suit. If this were the case then it could be argued that aggressive pursuit and execution of full interoperability with the US military would allow the CF to accomplish successful transformation. CF transformation however, is not so straight forward. While the US has tied transformation inescapably with technology, Canada has not.

In 2004, then CDS General Henault "clearly recognized that fundamental changes to the CF were necessary in order to better position the institution for the coming

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[161] Paul T. Mitchell, *A Transformation Agenda*…, 56.

[162] *Ibid.*, 55-56.

[163] *Ibid.*, 56.

decade."[164] The 2005 Defence Policy provided the foundation required for "fundamentally reorienting and restructuring the functions and the command and control of the CF to better meet the emerging security demands at home and abroad."[165] The CF was to adopt a fully integrated and unified approach to operations; evaluate the force structure on an ongoing basis; improve coordination with other government departments and interoperability with allied forces, particularly the US.[166] General Hillier further explained the transformation concept:

> … for the CF to achieve greater operational effects in Canada and around the world, it will need to assume a more integrated and unified approach to operations, which can only be achieved through a major transformation of the existing command structure, the introduction of new operational capabilities, and the establishment of fully integrated units capable of a high-readiness response to foreign and domestic threats.[167]

It was from this foundation that transformation was launched with an end state of "a CF that is strategically relevant, operationally responsive and tactically decisive, supported by an effective, efficient and adaptable defence institution, and capable of operating within a dynamic and evolving security spectrum."[168] CF Transformation was to be

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[164] BGen Daniel Gosselin and Dr. Craig Stone, "From Minister Hellyer to General Hillier: Understanding the Fundamental Differences Between the Unification of the Canadian Forces and its Present Transformation," *Canadian Military Journal*, 5 no. 4 (Winter 2005), 9.

[165] *Ibid.*

[166] Canada, *Canada's International Policy Statement: A Role of Pride and Influence in the World.* Defence (Ottawa: Government of Canada, 2005), 11-12.

[167] Gosselin, *From Hellyer to Hillier*…, 9-10, quoted Gen Rick Hillier, "Canadian Forces Transformation: From Vision to Mission," *The Hill Times*, 26 September 2005, p. 24.

[168] Gen Rick Hillier, "CDS Planning Guidance – CF Transformation," 10 November 2005, 2/10; available from http://www.cds.forces.gc.ca/cft-tfc/pubs/documents_e.asp; Internet; accessed 5 October 2009.

accomplished in four phases and based on six principles as described in table 6.1 below.[169]

Table 6.1 – CF Transformation: Phases and Principles

	Phases of CF Transformation	Principles of CF Transformation
1	Development of CF vision and analysis.	Joint Operations: from an environmental culture to a CF culture
2	Restructure CF command and control.	Operations Primacy: from an institutional focus to operational goals
3	Alignment of enabling functions and organizations;	Command Centric: from a staff-centric, matrix command and control construct to a command-centric one
4	Force generation re-design	Authority: a chain of command empowered with authority, responsibility and accountability to a higher command
5		Mission Command: from a risk adverse approach to an empowered mission command
6		Structure: towards an integrated structure to reflect the regular, reserve and civilian components the CF

CF transformation focuses on the establishment of new integrated organizations and structures, including a unified national command and control system.[170] In 2006, then Chief of Transformation, Lieutenant General Natynczyk stated that "transformation is not a destination but is a journey . . . it is continual because the world changes and with those changes the Canadian forces has to adapt."[171] In April 2010, Lieutenant General Leslie was appointed as the new CF Chief of Transformation;[172] a position that had not been

[169] The Maple Leaf, available from http://www.forces.gc.ca/site/commun/ml-fe/article-eng.asp?id=1970; Internet; accessed 1 March 2010.

[170] Hillier, "CDS Planning Guidance – CF Transformation," 3/10.

[171] Army News Online, "Team Ensures CF Transformation (video – 21 Feb 2006)," Quoted from LCdr Holborn, *Network Enabled Operations and Maritime Interoperability: Is the Navy on course for CF Transformation?*, 11.

[172] CANFORGEN, available from http://vcds.mil.ca/vcds-exec/pubs/canforgen/2010/090-10_e.asp

filled since 2007. The stated goal of the next phase in transformation is to focus on "improving efficiency and effectiveness of the CF in a post Olympic, G8, G20, and Afghanistan environment."[173] As well, one of the major thrusts will be a "better alignment of headquarters, from the strategic to the tactical level, to improve resource effectiveness."[174] This next phase in CF transformation may provide for the implementation of a JIMP-capable force.

The end of Cold War as well as new technologies brought on a revolution within western militaries. This revolution or RMA produced transformation within NATO, the US and Canadian militaries and created a technological gap between the US and its allies; a gap that, according to Lieutenant-General Joseph Kellogg will continue to grow:

> We are not going to slow down because they [allies] are behind us. We cannot afford to do that. The US military must remain the pre-eminent military in the world when it comes to technology…the US is not going to give away its high technology systems, and allies do not have the money to catch up.[175]

The US military started its own transformation so it could maximize its technological superiority and to promote jointness within its services. The CF followed suit and began its transformation in 2005, and as announced in April 2010, has now embarked on the second stage of that process. The Canadian military must remain interoperable with its key allies; the US being the number one priority, and must also achieve greater level of functionality between its own environments. Despite its clear technological superiority and military dominance, the US is committed to working with like-minded actors. As

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[173] *Ibid.*

[174] *Ibid.*

[175] Robert K. Ackerman, "Military Crystal Ball Portends Network-Centric Supremacy," *Signal Magazine*, (June 2001); available from http://www.afcea.org/signal/articles/templates/SIGNAL_Article_Template.asp?articleid=542&zoneid=54; Internet; accessed 14 April 2010.

stated in their joint doctrine manual, "…while US forces retain unilateral capability, whenever possible they will seek to operate alongside alliance or coalition forces…US commanders should expect to conduct operations as part of a multinational force."[176] Canada is expected to be a part of most US-led coalitions and as such must ensure it can effectively operate with the US military. The whole of government concept also requires a CF that can effectively interact with OGDs and NGOs, thus the need for a comprehensive approach. The next stage in transformation will provide an opportunity to make the required changes to the Canadian military to potentially enable the creation of JIMP-capable force that would be better equipped for functioning within a whole of government concept.

[176] United States, Department of Defense, *Joint Doctrine for Multinational Operations - JP 3-16* (Washington, D.C.: U.S. Government Printing Office, 5 April 2000), I-3.

CHAPTER 7: CONCLUSION

> *The ability to conduct joint operations and seamlessly operate with other government departments (OGD), also known as interagency operations, are the litmus tests of this (CF Collective Training) strategy.*
>
> - CDS, CF Collective Training Strategy, July 2007[177]

Canada is a middle power with a long and proud history of contributing to global security by employing its military in support of national goals. Since becoming a nation, Canada has participated in numerous operations and taken part in many conflicts supporting its allies. Canada played a key role during the First World War providing 100,000 soldiers on the European Western Front as part of the Allied effort. Its role was even more significant during WWII; by the end of that conflict Canada had supplied the Allies with the world's third largest navy, the fourth largest air force and a field army more powerful than in the previous war. Throughout the Cold War, as part of NATO, Canada's armed forces protected Canadian and Western Europe against armed aggression by the *Warsaw Pact*. As a "supporting actor", the CF always had to ensure it was capable of playing with the main actor. Initially that super power was Great Britain, but since WWII, the US has become the dominant power. Since then, and also because of its NORAD commitments, the CF's number one priority, as mandated by a multitude of high-level documents, has been to be interoperable with the US military. However, the end of WWII also saw the creation of another strong alliance, which along with Canada and the US, included Australia and Great Britain. This four-eye alliance added New Zealand in 2006 and is now known as the five-eye community. Although not specifically

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[177] Minister's Message, DND Report on Plans and Priorities 2007/2008, available from http://vcds.mil.ca/dgsp/00native/reppub/ddm/rpp/rpp0708/RPP0708_e.pdf; Internet; accessed 1 March 2010.

stated in any official documents, interoperability with the five-eye community is the number two priority for the CF. Finally and despite being responsible for significantly advancing interoperability for the alliance, NATO is last on the CF priority list. By following a multitude of bi-lateral agreements with the US and taking part in five-eye interoperability forums, the CF managed to remain fairly interoperable with its key allies; however that interoperability was mostly inter-service. In other words, the Canadian Army was interoperable with the other five-eye armies through their ABCA program and similarly, the Canadian Air Force achieved interoperability with five-eye air forces through the ASIC forum, but these stove-pipe organizations did not provide for interoperability at the joint level. This shortfall was identified in the first Gulf War and amplified during the 1999 Kosovo campaign. This led the five-eye forums re-organization which allowed them to focus on becoming more joint. NATO went through its own re-organization as well and in 2002 created ACO and ACT to provide the alliance with more jointness. However, the US military was first to go through a true transformation, which was based largely on technological superiority, but also on the need to improve their effectiveness at the joint level. The CF, which had always been focused on being interoperable with the US and other key militaries, now also had to become more joint. Therefore, in 2005, the Canadian military embarked on its own transformation with a stated purpose to enable the CF to become more relevant, responsible and effective, but interoperability at the combined and joint level is no longer enough. This transformation was also brought on by the new security environment and new global threats such as terrorism; international crime; intra-state ethnic, cultural, and religious violence.

The period from the late twentieth to early twenty-first centuries has seen a fundamental realignment in the global balance of power resulting in significant advances in arms control, conflict resolution, and democratization in the Third World. This progress, in the form of a reduced threat of global war, has been tempered by a rise in intra- and inter-state conflict in some regions of the world. Canada's ability to continue to contribute to international peace and stability is dependent upon relationships with like-minded partners and the effectiveness of the Canadian Government in employing the CF as an instrument of national power. However, the CF is only one instrument and other national organizations are being used more and more by the Canadian government; this whole of government approach to security is most evident in areas like Afghanistan. Although this approach or concept has long been regarded as being of secondary importance to the military, times have changed. The nature of operations today and in the future will be one that requires the soldiers to interact with many different players other than their own armed forces, and undertake non-traditional tasks. There is an increasing requirement for interoperability throughout the broad spectrum of operations through involvement with allies, coalition forces, OGDs, and NGOs. Interoperability with the US remains the top military priority for the CF; however, the concept of interoperability must be viewed in the broadest possible manner. Concepts, such as the comprehensive approach and JIMP are gaining acceptance, but a strategic military doctrine that is sufficiently flexible to accommodate government priorities is also required to meet the demands of the new security environment. To meet these requirements the Canadian military must be structured to defend Canada and possess

global expeditionary capabilities and forces readily adaptable to international events in support of Canada's foreign policy objectives.

Significant progress has been made through the first stage of CF transformation, however in the long term, the CF is not well structured or organized to address the strategic and operational interoperability requirements in a comprehensive fashion. Unless a concentrated effort is made in achieving interoperability at all levels, there is a real risk that: first, the CF will become less interoperable with its principal defence partners; and second, that the Canadian military will not be well positioned to meet the broader and more complex security challenges of the next decade. Also, the broader and more complex security challenges being experienced domestically will mandate a greater degree of interoperability between the CF, OGDs and NGOs at home as well. Accordingly, as stated by Lieutenant-General Leslie, "the time has arrived to embrace a new vision of military operations – one that incorporates a broader view of security as well as those capabilities required to attain that security."[178] He adds that "the CF pursuit of a comprehensive approach, nested within whole of government thinking, offers just such a vision."[179] As military forces evolve, they will not only engage in security missions but will also have a hand in governance and development activities leveraging the military, political, and economic instruments of a state's power.

The CF must remain interoperable with its key allies; it must become more interoperable at the joint level and must become interoperable with other key non-military organizations so it can effectively operate within the whole of government context. Despite the challenges brought on by the new security environment as well as

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[178] Leslie *et al*, *Developing a Comprehensive approach*…, 15.

[179] *Ibid.*

the increasing technological gap, there is no CF organization responsible for interoperability. This paper demonstrated the difficulty in achieving true interoperability within the military environment and has identified the need for the CF to become a JIMP-capable force, yet within the post-transformation construct, there is no CF organization tasked with making sure the Canadian military is interoperable. The newly announced second stage of CF transformation provides the opportunity to create such an organization with the mandate to ensure the CF remains interoperable with the US military and other key allies; to provide the joint champion and to work with other non-military organizations to advance interoperability at that level. A CF interoperability organization is needed.

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