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SUSTAINMENT TRANSFORMATION:

If You Don't Know Where You're Going, Any Road Will Get You There

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Abstract

This paper argues that over the next ten to twenty years the Canadian Forces (CF), along with most Western military forces, will undergo a radical transformation of its sustainment concepts, doctrine and systems. Many of the technology developments that will permit, and in some respects force, this change have already emerged. However, the CF has yet to articulate a conceptual frameworo it hemd. .rm

Sustainment Transformation:

If you don't know where you're going, any road will get you there[1]

INTRODUCTION

Over the next ten to twenty years, the Canadian Forces (CF), along with most Western military forces, will undergo a radical transformation of its sustainment concepts, doctrine and systems. Many of the technology developments that will permit, and in some respects force, this change have already emerged. However, the CF has yet to articulate a conceptual framework that will enable it to fully exploit them. Nor has it established a plan to manage the transformation. Rather, it is drifting through change by addressing discrete problems one at a time.

To note only one example, the CF has introduced or upgraded four separate major information systems for sustainment capabilities in recent years:

- The CF Supply System (CFSS), based on the MIMS software;
- The Materiel Acquisition and Support Information System (MASIS), based on the SAP software;
- The Financial and Managerial Accounting System (FMAS), also based on SAP; and
- The PeopleSoft human resource information system.

For want of a strategy, therefore, the CF is operating four Enterprise Resource Planning (ERP)[2] systems when one or perhaps two would suffice. Similar fragmentation afflicts the development of other sustainment capabilities.

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[1] LGen M.K. Jeffery (Ret'd) Chief of the Land Staff from 2000-2003. He often used this expression in discussions with his staff, which included the author.

[2] Information Technology industry term for an integrated corporate software package.

It is inherent in the development of military forces that today's planners are constrained by the decisions of their predecessors, often many times removed. Platforms and systems have service lives measured in decades. Changes in training require years to implement. Professional competencies, thought and doctrine take years to evolve.

The challenge is to work through these limitations while shaping sound, yet visionary, plans for the future. This is where the CF is failing in its management of sustainment transformation. Simply put, there is no plan. Instead, there is a smorgasbord of discrete change initiatives, including, *inter alia*:

- The R_X 2000 Project directed by the Commander, CF Medical Group;
- The Materiel Acquisition and Support Optimization Project (MASOP), directed by the Assistant Deputy Minist

The aim of this paper is to explore the nature of the sustainment transformation the CF is embarked upon, and to propose a framework for managing the change.

DEFINITION

The CF officially defines sustainment as:

> *The requirement for a military force to maintain its operational capability for the duration required to achieve its objectives. Sustainment consists of the continued supply of consumables, and the replacement of combat losses and non-combat attrition of equipment and personnel.*[3]

Within US joint doctrine, it is defined as:

> *… the provision of personnel, logistics and other support required to maintain and prolong operations or combat until successful accomplishment and revision of the mission or national objective.*[4]

Neither of these definitions is satisfactory. The CF definition omits many essential sustaining functions such as morale, welfare, and facilities construction and maintenance. The US Joint doctrine definition lacks clarity.

A better description has been articulated by the Directorate of Land Strategic Concepts (DLSC) in its analysis of future Army capability requirements:

> *Sustainment is an overarching term that covers all activities related to the provision of personnel, materiel and engineering support services. This includes in-theatre support as well as the training, education and preparation of replacements and augmentation forces. The services provided include supply, maintenance, transportation, health, personnel support, legal, financial, religious, public affairs and sustainment engineering.*[5]

This paper will apply the more useful DLSC description and define sustainment as the provision of personnel, materiel and infrastructure engineering support to military operations. This includes supply, maintenance, movements, transportation, health,

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[3] B-GG-005-004/AF-000 Canadian Forces Operations.GL-E-8.
[4] United States Department of Defense, Joint Publication 4-0, *Doctrine for Logistic Support of the Armed forces of the United States* (Washington: US Government Printing Office, 1999) GL 13.

personnel support, legal, financial, religious, public affairs and infrastructure engineering. The term excludes Combat Engineering, tactical manoeuvre of troops, battlefield first aid and other functions directly related to the conduct of combat operations.

SCOPE

Broadly speaking, sustainment is delivered in three domains. The first is provision, from fixed infrastructure, of national and local support to permanently based forces. The second is in-theatre support to deployed forces provided from static and reasonably secure locations, often using adapted facilities. The third is support to mobile combat operations, usually in austere conditions. Each domain has unique requirements in terms of capabilities and systems, and any given operation will normally require elements of at least two. For example, Operation ATHENA (CF commitment to the International Security Assistance Force in Kabul, Afghanistan) is supported by fixed camps in Kabul and the United Arab Emirates, linked back to national infrastructure.[6] Had Canadian ground forces been committed to Operation IRAQI FREEDOM in 2003, robust, mobile support would have been required,[7] as well as fixed facilities in theatre backed up by national infrastructure. This paper will address all three sustainment domains, noting that the third represents the area of greatest risk and challenge.

CONTEXT

Although there are three sustainment domains, CF operational doctrine for sustaining warfighting is designed primarily for the third. It is founded upon a concept of

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[5] DLSC Report 01/01 Future Army Capabilities (Kingston, ON, Directorate of Land Strategic Concepts, Department of National Defence, 2001), 33.
[6] Op ATHENA Operations Order.
[7] For some insights see UK MOD report Operations in Iraq – First Reflections (Director General Corporate Communications, July 2003), Chapters 4 and 5. Also, Lester W. Grau and Timothy L. Thomas. Soft Log and Concrete Canyons: Russian Urban Combat Logistics in Grozny. Marine Corps Gazette, Vol 83, No 10 (October 1999), pp 67-75.

echeloned support, further defined as First to Fourth Line. Tactical level support (First, Second and some Third Line) is designed around a construct of Integral, Close and General Support.[8] This complex system is designed to give commanders at all levels a measure of control over the allocation of support resources based on their operational priorities. It is also intended to ensure that combat operations are not impeded by logistical considerations, including interruptions in the replenishment system. Redundancy is purposely built in to limit the risk of catastrophic damage to the system and, hence, the warfighting capacity of the force.

The underlying concepts for this doctrine came from Allied experiences in WW II (with roots extending back much further[9]) and the challenge faced in supporting the rapid advances after the breakout from Normandy in 1944. Distribution of combat supplies (fuel, ammunition, food and water) from the ports to forward units proved extremely difficult, and initial support plans had to be ditched in favour of massive improvisation.[10]

This wartime experience was tempered by years of planning for confrontation with the Soviet Union, in the context of unification and the downsizing of the Canadian land and air commitments to NATO. Development of the sustainment system was heavily influenced by the fact that there was a known theatre of operations, a known threat and robust fixed infrastructure supporting NATO-assigned forces. This relative stability and predictability permitted considerable latitude to manage risk. For example, the risks associated with cross-Environmental posting of support personnel could be mitigated within Army Combat Service Support units because they had a mix of static

[8] B-GL-300-004/FP-001, Chapter 2.
[9] For a good historical overview see Martin van Creveld, Supplying War – Logistics from Wallenstein to Patton (Cambridge University Press, 1977).
[10] Ibid, Chapter 7.

and mobile billets. There were also resources and time to train new arrivals in the basics of land sustainment operations. Further, NATO support operations were relatively easy to train for, with established plans, drills and procedures for any likely scenario.[11]

The relevance of these Cold War-designed, WW II-derived support concepts and systems to the current challenges of rapid, global response to diverse crises has come under critical scrutiny in recent years. Many countries have concluded that there is a need to update operational level doctrine and improve systems.[12] There is also agreement on the need to develop practical tools to guide coalition sustainment activities.[13]

Internationally, therefore, considerable effort is going into changing sustainment systems to meet current requirements, and making efficiency improvements to stretch capability as far as possible within constrained budgets. Unfortunately, in the case of the CF, this effort has so far been fragmented and primarily reactive in nature. If Canada is to make best use of its limited resources, a coherent, disciplined, planned approach must be taken to transforming sustainment capabilities from a Cold War designed system to one that is relevant to the XXI century.

STRENGTHS TO BUILD UPON

Canada is uniquely positioned to successfully transform its military sustainment capabilities. Whatever its faults, the unification of the CF and creation of single logistics, medical and other systems places Canada well ahead of most Western militaries in its ability to rationalize systems. Indeed, it has had some notable success. For example, the

[11] An example is the REFORGER plan to reinforce Europe. This was vastly easier to implement than the 1990 - 91 deployments of US troops to Saudi Arabia. Lt Gen William G. Pagonis with Jeffery L. Cruikshank, Moving Mountains – Lessons in Leadership and Logistics from the Gulf War (Harvard Business School Press, 1992), 66.

[12] Ibid, Chapter 8. See also Lt Col Kevin Leonard. Key Logistics Issues from Kosovo – Can the United States Achieve Strategic Velocity? (US Army War College, 2000) as well as UK MOD report Operations in Iraq – First Reflections.

CF has achieved tremendous efficiencies in its materiel distribution system. Facilities have been greatly consolidated since unification, and MASOP today continues a long history of searching for even more economies. Canada also has a single supply information system, whereas many countries have different systems for each Service. CFSS functionality is well rooted in the first and second sustainment domains and while technical limitations currently preclude it from being fully projected into the domain of mobile operations, these can be resolved in time.

CFSS, however, is but one element of a sustainment information system. It needs to be combined with others before operational commanders can have full visibility into the state of their support systems, and their ability to meet the demands of current and proposed operations. Additional elements of such an "Integrated Information Environment" (IIE) either exist or are emerging in the form of the MASIS, FMAS and PeopleSoft systems. The process of integrating these systems, however, is painfully slow and difficult. In their present configurations it may be impossible. To fully solve the problem, the systems will eventually need to be merged into a single ERP platform. In the meantime, bridges to allow the exchange of key data are being built between some of them, and this should give the CF the initial makings of a good, if imperfect, IIE framework for sustainment.

A second area of strength enjoyed by the CF is the Command and Control (C^2) of sustainment capabilities. At the strategic level, the CDS has full authority to establish unified command of CF sustainment operations. Further, there is undisputed centralized management of DND and CF policies, strategic systems and processes in the areas of materiel, personnel, medical and other sustainment functions. In contrast, many countries

[13] The ABCA Coalition Logistics Handbook is a good example.

have only limited central control over single-service support systems and at the operational level this fragmentation creates problems. For example, as far back as the 1991 Gulf War, attempts were made to establish unified operational command of US theatre logistics,[14] with limited success.

The potential cost of fragmented and undisciplined management of sustainment systems can be high, and British historian Richard Overy has shown that this was a major factor in the German defeat in WW II.[15] While it would be wrong to suggest that problems of the same magnitude exist among the Western Allies today, the need for centralized management of sustainment systems is a recurring theme in post-operations analysis of recent conflicts.[16] The CF, having had a unified strategic framework for many years, is well positioned to influence system development among its major allies towards solutions with which it can effectively interoperate.

The trend towards centralized management includes the concept of Joint sustainment at the operational and even tactical levels. In Canada, the current NMSC Project is only the most recent manifestation of this evolution, although it is by far the most coherent initiative to date (despite having many faults). Earlier concepts for the creation, at need, of Joint "National Level Units" were hardly more than vague ideas.[17]

Development of CF Joint sustainment capabilities has always been severely hindered by the lack of a coherent Canadian concept of Joint operations. Being, at least in law, a unified military force, Canada should be at the forefront in articulating Joint concepts and doctrine. Instead, it is lagging in the intellectual and professional debates

[14] Pagonis and Cruikshank, 215.
[15] Richard Overy, Why the Allies Won (Random House, 1995), Chapters 6 and 7.
[16] Noted in Pagonis and Cruikshank as well as the UK MOD Report Operations in Iraq – First Reflections.
[17] Capt(N) Bryn M. Weadon Canada's Joint Sustainment Coordination Capabilities. (CFC October 2000).

about Joint warfare as the CF's small size and chronically constrained resources have led it to focus on preserving tactical competencies in Combined settings. Unfortunately, this has clouded and confused discussion about CF Joint sustainment capability and consequently the NMSC Project has had to be reoriented more than once.

In the absence of clarity, the Project can still move forward by doing what private sector organizations do all the time: focusing on core competencies. In this case, these are capability areas that unarguably merit Joint solutions and that a specialized organization such as the Joint Support Group (JSG) can provide better than anyone else. These would clearly include such tasks as theatre activation, theatre closeout and, arguably, control of the strategic lines of communications to all deployed CF missions. The evident recent success of the JSG Headquarters-led Op ATHENA Theatre Activation Team in building the Canadian camp facilities in Kabul, Afghanistan clearly supports this view.[18] It also shows that the CF is getting good value out of its limited investment in Joint sustainment capabilities and is in a good position to capitalize further.

The third important strength enjoyed by the CF is the technical competence of its support personnel. Given the limited size of Canada's military, personnel quality has been emphasized over quantity for many years, and it shows. Person for person, CF support troops display a level of technical expertise, adaptability and ingenuity that is unsurpassed anywhere.[19] (Operational competence is another matter, which will be addressed later.) These high standards of technical expertise are reflective of excellent

[18] Author's observation from the vantage point of his position as Army G4 during the period in question. The conclusion drawn needs to be validated in the POR process but the view is widely shared.
[19] Author's perspective based on considerable direct personal experience working with Austrian, Japanese, Polish, UK, and US armed forces, plus information exchanges with Logistics officers in various international fora such as NATO, ABCA and the Conference of American Armies.

training and professional education. It is just this kind of intellectual base that is needed for the successful transformation of any organization.

In fact, CF support personnel are already pushing quite forcefully along a path of innovation, and have been doing so for many years. MASOP is only the most recent attempt to encourage and harvest the benefits of creative initiative. The challenge is to give focus to innovation, without stifling its spirit, and to find a way to orchestrate it. Absent such coordination, there is a considerable risk that many innovations, though perhaps providing short-term local benefits, will cancel each other out or, worse, increase friction across the whole of the system and drive up overall operating costs.

The appetite for improvement is very strong at the working level within the CF sustainment community.[20] All that is needed to bring that energy to bear on a solid transformation agenda is leadership, vision, and commitment.

CHALLENGES TO OVERCOME

If the CF is to successfully exploit its strengths in effectively managing sustainment transformation, it will need to act soon to overcome a number of significant challenges. Resource constraints will invariably be pointed to as a major limitation, and they are undeniably an issue. However, resource constraints are in many ways an intellectual crutch to justify inaction. They do not preclude visionaries from establishing plans and programs for getting as much as they can from the resources they do possess. Resource constraints, therefore, do not figure in the list of challenges discussed here.

[20] Even for the widely distrusted Supply Chain Project, significant efforts were made at local levels to identify and exploit the potential benefits. See the report (no file number) Supply Chain Project – Logistics Branch Personnel Feedback – Land Force Québec Area. June 2001. The failure of the Project Office to make effective use of the considerable input it received was reflected in the flawed analysis it presented to senior management, and was a significant factor in the decision to terminate the project. (Author's personal observation as Army G4 and principal advisor on the subject to the Chief of the Land Staff.)

The foremost challenge is defining the owner of the problem. No visionary plans for the future can be produced if no one is responsible to ensure they are developed.

Sustainment responsibilities are widely dispersed across the CF and the civilian component of DND. For example, significant logistics capabilities are spread among ADM(Mat), the three Environmental Chiefs of Staff (ECSs), the Deputy Chief of the Defence Staff (DCDS) and ADM(HR-Mil). Other capabilities are similarly fragmented.

In almost every case, executives who manage major components of the system also have other complex and demanding responsibilities. ADM(Mat) is a case in point. Although he has responsibility for many operational logistics matters, his expertise and his focus are necessarily elsewhere – DND's major Capital acquisition and National Procurement programs. The hard reality is that CF sustainment transformation, however important, can never be anything more than a management distraction to the civilian executive charged with delivering one of the most complex and politically sensitive major spending programs in government. It is unrealistic to expect anything else.

The second challenge faced by the CF is improving the operational competence of its support personnel. As noted earlier, their technical abilities are second to none. However, significant deficiencies have been identified in their force protection skills, their training in the conduct of sustainment operations in hostile environments, and the ability of leaders at all levels to successfully organize and lead such operations.[21]

[21] Correspondence in the author's possession from former CF support element commanders to the DCDS (i.e., the author in 1997, following command of the UNDOF Log Battalion in Op DANACA, and Colonel F.M. Boomer in 2003, following command of the Camp Mirage support base in Op APOLLO). The same issue is noted in the minutes of the March 2003 meeting of the CF Professional Development Council. A paper (not catalogued) produced by Advanced Logistics Officers' Course 0301 at the Canadian Forces School of Administration and Logistics also discusses the problem.

The missions the CF must be prepared to undertake today are very different from those of the past. Peace support missions are now rarely conducted in permissive, low-threat environments and support troops require much more than their traditionally strong technical abilities. Many essential skills can't be acquired overnight, especially the advanced competencies needed by leaders to plan and lead sustainment operations in hostile environments, and to conduct effective collective training. Support personnel are frequently among the first on the ground in new missions and will often have little time to do pre-deployment training.[22] Further, the increasing reliance on Joint support structures considerably reduces the tolerance for significant variations in training across the CF.

Therefore, while the Army will always need to maintain unique competencies in mobile sustainment operations for warfighting missions on land, all CF support personnel need to be well trained in the conduct of land-based support missions in medium threat environments. The current trend towards tougher, more complex missions and a growing asymmetric warfare challenge only make this more urgent. Support systems are attractive targets for asymmetric attack, and the inexorable trend towards smaller, more agile, support structures will place ever-increasing demands on lower level leaders. The need to change is therefore urgent.

The third challenge is the lack of good modeling and simulation tools for support operations.[23] While considerable effort has gone into the development of simulations for combat operations, few comparable products are yet available for sustainment. As a consequence, the design of sustainment systems, the planning of support operations and

[22] See, for example, Pagonis and Cruikshank, Chapter 4.
[23] Author's observation based on his efforts, with Operations Research staffs, to identify suitable tools.

the training of support planners and commanders are principally done by the application of "best professional judgment" and only a few objective analytical tools.

The validity of the "best professional judgment" approach is highly questionable for the CF, since almost all of its expertise is based upon a generation's worth of experience in establishing *ad hoc* support arrangements for relatively small deployments to static locations. Major warfighting operations, or even exercises, have been few. As no strong mechanisms exist to distil and integrate lessons learned from either operations or exercises into CF support doctrine and training, "best professional judgment" is inevitably going to be highly subjective and variable in its outcomes.

Objective modeling and simulation tools can provide better means of analyzing capability requirements, developing sustainment plans and training staffs to conduct complex operations. There are also activities that simply cannot be realistically practised other than through simulation. For example, the complexities of global force projection and the management of long strategic lines of communication cannot really be simulated in any field training exercise held in Canada.

Advanced modeling and simulation tools are also desperately needed to improve requirements prediction. Today, requirements estimation is largely based upon tables and models designed for the European Central Front and directly descended from planning tools developed during WW II. These models have a long history of overstating requirements by a considerable margin,[24] and the cost of this is high. Valuable air, sea

[24] Martin van Creveld noted "…the Allied advance from Normandy to the Seine, however successful and even spectacular strategically, was an exercise in logistic pusillanimity unparalleled in modern military history." 215. Following the 1991 Gulf War the US Army shipped back 41,000 sea containers of supplies in a period 2 108.84 Tm(W)Tj10.4131.3 93 97.31996 Tm2 108.84 Tm(W)Tj10.6.2 19015 97.31996 Tm12(a)Tj10.02 0 0 10.02 6.

and overland lift is taken up by the movement of unneeded supplies. Campaign timelines may be significantly impacted by inflated logistics buildups, and in some cases campaign plans may be unnecessarily constrained by overblown logistics considerations. Finally, all that unused materiel has to be either disposed of locally or repackaged and returned home at the end of operations. At least some of these costs can be avoided with better tools for more realistically determining materiel requirements, and controlling the delivery and distribution of critical supplies.

Overcoming these three challenges: putting in place the required leadership, improving the operational competencies of CF support personnel and acquiring adequate modeling and simulation tools, is essential to success.

THE NATURE OF SUSTAINMENT TRANSFORMATION[25]

As noted at the outset, CF sustainment capabilities will transform in the coming years, whether in accordance with a coherent plan or not. Transformation will occur for several reasons. First, as existing systems are gradually replaced, the new ones will inevitably reflect current technologies and concepts. Whether the CF buys these systems with the intention of fully exploiting their capabilities or not is immaterial. Unless it pays extra to "dumb them down" experience shows that the CF's highly skilled support personnel will push their capabilities to the design limits, or beyond.

Secondly, the CF cannot isolate itself from its environment. Military and commercial support systems around the world are rapidly changing as new technologies

[25] Except where noted, the material presented in this section represents the author's own perspective on the future evolution of sustainment technologies and systems. It owes much to work done in recent years by DLSC (e.g.. Ernest B. Beno and John D. Joly. DLSC Research Note 0001 - Sustainment Capabilities for the Army of the Future. (Kingston, ON: Directorate of Land Strategic Concepts, March 2000).). However, many other sources of insight and the author's personal views are also reflected. Any factual errors or flaws in logic are the author's alone.

are comprehended and exploited. In addition, more and more support functions are being outsourced, forcing the CF to build and use comprehensive interfaces with advanced private sector systems. Nor can the efficiencies of these commercial systems be ignored by an organization that has serious human and financial resource constraints. For all of these reasons, the CF will inevitably be forced, over time, to adopt more advanced, more efficient and better integrated sustainment tools.

Conceptually, therefore, the organization has a choice between a proactive approach, in which it consciously selects new systems for their contribution to a transformation plan, and a reactive approach in which capability is largely defined by external pressures. However, the reactive approach is untenable. Apart from the intellectual and leadership failure it represents, it is prohibitively wasteful and expensive. With no disciplined continuity of thought or effort, resources will be committed to secondary or unneeded capabilities while some core requirements will not be met. Second and third order effects will rarely be considered and therefore surprise will become a major element of the process. These consequences are simply not affordable.

Regardless of the approach taken, analysis of the technology environment leads to the conclusion that the transformation of CF sustainment capabilities will encompass two obvious elements. The first is an evolution of information systems to eventually create an essentially seamless, real-time knowledge web from the strategic to the tactical level. Commanders at all levels will have full access to whatever information they require to ensure the success of current missions and plan future ones.

The second element is continuing improvement in the speed and efficiency of distribution systems. This will be founded on the development of advanced modular

container systems, handling tools and delivery platforms. These systems will allow significant reductions in logistics footprints and increased logistics agility in operational theatres by speeding up materiel handling, simplifying and reducing the need for cross-loading, and improving efficiencies in delivery systems.

In combination, these technology improvements will permit a radical redesign of distribution systems right up to the forward elements. The traditional "iron mountain" approach to logistics, involving the stocking and movement of large inventories of materiel, robust equipment recovery and repair capabilities, secure bases and protected supply routes, will disappear because it is simply not viable in non-linear, asymmetric warfare. It is also a very expensive way to provide support.

By leveraging new technologies, it will be possi

essential commodities will be constantly monitored. The uplink of on-board data will provide a continuous picture of blue force equipment and materiel status that, together with advanced modeling and simulation tools, will facilitate more efficient replenishment planning. Further, better prediction of future combat supplies consumption will be made based on comprehensive analyses of planned operations;

- Strategic delivery systems will become more flexible and agile. Predictable sustainment requirements that cannot be met from local sources will largely be met through inexpensive sealift, however strategic airlift will remain essential for meeting surge requirements. Trans-shipment from strategic to theatre delivery systems, where required, will be rapid and highly mechanized. Direct delivery from the strategic to the tactical level will become increasingly common;
- Forward replenishment and repair activities will be more closely integrated into the non-linear battlespace tactical manoeuvre plan, both to ensure security and to keep combat elements as fully supplied as necessary to meet the commander's objectives;
- Replenishment will increasingly use modular container systems that allow mixed commodity packages to be prepared far to the rear (perhaps ultimately back in Canada) and delivered right to a unit or sub-element. Delivery options will include advanced aerial and overland container

[26] See, for example, Beno and Joly as well as DLSC Report 01/01 Future Army Capabilities.

moving systems. Armoured logistics vehicles will deliver supplies to forward elements engaged in urban and other close terrain operations;[27]

- Forward repair will apply advanced prognostic and diagnostics capabilities as well as functional item replacement concepts. Equipment recovery and backloading requirements should be largely confined to battle casualties;
- Support elements operating in forward areas will be relatively small and, where required, highly mobile. They will require robust self-defence capabilities. Rear areas, to the extent that they will exist, will also need good self-defence capabilities, particularly against asymmetric attack; and
- C^2 of the support system for any mission will normally be organized as a Joint structure and highly centralized to ensure that it operates as a seamless whole. Clearly, tactical considerations may require that forward-deployed support elements be commanded, or at least controlled, by the supported unit or formation. However, in principle the support for any given theatre, including the strategic lines of communications, will be under unified command. At the same time, commanders at all levels will have full visibility of the sustainment information they require.

The evolutionary development of CF logistics and other sustainment capabilities along these lines will create a highly agile and flexible, yet robust, support system. The guarantee of support required by operational commanders and combat units will be provided by effective management of the flow within the distribution system rather than

[27] See Grau and Thomas.

large stockpiles on the ground. The resulting reductions in sustainment footprint will in turn reduce demands for lift, rear area security and support troops.

The model is not without its risks, but they are manageable. The most significant risk is the potential loss of system redundancy, and consequent increase in fragility. One benefit of the practice of holding large inventories at different echelons is that the loss of any one stockpile is not normally catastrophic. The design of future theatre sustainment systems will need to incorporate risk mitigation strategies to ensure that inbound flows cannot be interdicted. As a minimum, every major node in the system will require at least one backup that can be activated almost immediately. Also, it is unlikely the holding of in-theatre stocks of critical supplies can ever be completely eliminated; any system needs buffers against shock.

This is the general direction in which CF sustainment capabilities will inevitably evolve. It is fully consistent with the concepts emerging among Canada's major allies and is based on technologies and tools either already available or in development. The transformation will either occur efficiently because the CF will have established a plan to achieve it, or it will occur inefficiently because the interoperability imperatives of allies and private sector support partners will have forced it to happen.

TAKING CONTROL OF SUSTAINMENT TRANSFORMATION

How, then, should the CF exploit its strengths and overcome the challenges to successfully manage sustainment transformation?

The first requirement is to put someone in charge of the problem. As noted earlier, responsibility is currently highly fragmented. Given the size and complexity of

the systems concerned, it is probably inevitable that there will be some division of responsibility, but the current construct is demonstrably not working.

One of the major reasons is the practice of lumping key CF operational support responsibilities into large, civilian-led Departmental organizations. As noted above, the leadership of these organizations must maintain a primary focus on the large Departmental systems and programs they manage. Quite understandably, they have neither the expertise nor the time to provide leadership direction to the transformation of CF operational support capabilities[28]. At best, they can be cheerleaders.

In order to overcome this problem, it may be possible to designate a military member of Defence Management Committee to provide executive leadership for CF sustainment transformation. Under the current construct, this would likely be the DCDS, consistent with his growing force generation responsibilities for CF Joint capabilities. It must be seriously questioned, however, whether this is wise. With operational tempo as high as it is, and no prospect of relief in sight for the foreseeable future, does it make sense for the primary force employer to be given major (or even any) force generation responsibilities? The intellectual and geographical spans of control across these two complex areas of responsibility are vast and it is probably both unfair and unwise to assign them to a single individual, no matter how gifted he or she may be. It is inevitable that the immediate demands of current operations will crowd out the leadership attention required by a complex transformation program.

[28] The practice also violates some basic principles of C^2 by assigning responsibilities and authorities to individuals who, through no fault of their own, lack required competencies. See Dr. Ross Pigeau and Carol McCann, Reconceptualizing Command and Control. Canadian Military Journal, Vol 3 No 1 (Spring 2002) pp 53-63.

A better answer would be the appointment of a separate force generator for CF Joint capabilities, complementing the three ECSs. Executive leadership of CF sustainment transformation would be a logical responsibility for such an office. While a comprehensive analysis would be required to identify all elements that should be assigned to a "Joint Forces Command", major formations could certainly include the Joint Support Group, the CF Information Operations Group and the CF Medical Group. The CF Support Training Group would also be a logical fit. Certainly, the basis for a very viable, if complex, structure is available.

The creation of a Joint force generator could thus solve a number of CF capability development problems. At the same time, the civilian managers of several complex and demanding strategic programs could be freed from the distractions of transforming CF operational capabilities. Therefore, while acknowledging the difficulties associated with creating a new senior military position and its associated overheads, this approach is by far the most effective way to manage CF Joint transformation, including sustainment.

Regardless of whether it is a new Joint force generator or an existing office, a senior military leader with the expertise, the mandate and the time to oversee sustainment transformation needs to be given the task. This is the main precondition for success.

Having identified the owner of the problem, the second requirement is to assign appropriate resources to dealing with it. This need not include a large full-time staff. In many respects, the best model is a relatively small core team working with an extended group of selected part-time members covering the capabilities and major organizations involved. This approach has two major benefits: it ensures that the work is disciplined

by ongoing “reality checks” by people working real issues; and it embeds change agents in the organization who understand the underlying imperatives and logic for the changes.

Sustainment transformation within the CF will inevitably be a lengthy process. Although the eventual outcome will represent a revolutionary change from what is in place today, getting there will be a largely evolutionary process in terms of the incremental impact of each successive element of change, if only because of the timelines involved. That said, the CF cannot afford to delay the establishment of an architecture to plan, direct and manage the transformation. Significant resources are being expended today on systems whose lifetimes are measured in decades. These acquisitions should be decided within a coherent plan that reflects a clear vision of where the organization wishes to go.

Hence, the third requirement is to develop the plan. Given the nature and duration of the transformation, the plan will need to be a living document subject to regular revision and update. However, the vision statement around which it is built should be much more durable. Ideally, it will never need amending. Realistically, it will periodically need to be revisited as technology, the understanding of technology and the organization’s experience with the process evolve.

Like a campaign plan, the sustainment transformation plan will require the identification of, among other things, a number of lines of operation, objectives and a well-articulated statement of intent. Lines of operation might be described in terms of information and knowledge capabilities, distribution and delivery technologies and command and control. Objectives could be established based on the integration of specific high-impact technologies, such as successful completion of the MASIS rollout.

Articulation of the intent will be one of the most important contributions of the senior officer designated to lead the transformation. Although the staff will provide a great deal of assistance in crafting a concise statement, the final product must clearly present the executive leader's vision for the future.

The fourth requirement is to establish appropriate controls over all activities and processes affecting the transformation. This can be accomplished in a number of ways. The transformation team can be mandated as an approval authority for establishment changes, equipment acquisitions and other actions affecting CF sustainment capabilities – if they do not approve a proposal it cannot go forward. This has a number of problems, including the potential for considerable conflict. Experience with DND's many attempts to impose control over Information Technology acquisitions would suggest that it is not a very effective solution, especially if proposing organizations come to view the controlling office as an obstacle, rather than a facilitator of progress.

An inclusive approach would be much better. By keeping all organizations having a stake in sustainment transformation engaged in the planning and implementation of change, the CF is more likely to create a sense of common purpose and a common understanding of the linkages among initiatives. The key is to ensure that the same individuals are engaged on both sides of the fence: the person overseeing, for example, development of the Navy's sustain capability must be the same person representing the Navy in planning and implementing the CF's sustainment transformation.

Either approach can be made to work. Both require a good deal of effort. The point is that a conscious decision must be made to maintain control over the transformation process.

By putting in place a framework comprising these four core elements: leadership, modest resources, a plan and appropriate controls, the CF will be in a good position to effectively manage sustainment transformation.

CONCLUSION

Sustainment transformation will occur in the CF, and in fact is already under way in a number of respects. Unfortunately, this change is not being actively managed according to a coherent plan. Unless the organization seizes control of the process, it is inevitable that progress will be characterized by confusion and waste.

The direction of change is towards an agile sustainment system based on advanced knowledge and distribution systems, and sophisticated requirements planning and prediction tools. This paper has reviewed some of the major characteristics of this transformation. It has also identified a number of reasons why it will happen whether the leadership of the organization controls the process or not.

Some key strengths enjoyed by the CF have been considered. These include its unified systems and structures, the technical competence of its support personnel and the rapidly evolving technology environment within which it operates. If properly harnessed, these strengths offer great potential to achieve significant improvements in capability for relatively modest levels of investment.

Conversely, a number of critical challenges have been identified, chief among them being identification of an appropriate executive leader of CF sustainment transformation. The importance of this cannot be overstated. While it has been shown that some form of transformation is inevitable, and will eventually happen even without coherent management, the outcome of such an approach can only be sub-optimal and the

process extremely wasteful. Successful transformation requires effective leadership. For the CF to succeed in transforming its operational sustainment capabilities, the process must be led by a military leader with the competence, authority and responsibility to direct it. That leader must also be free to devote the energy and attention required by what will be a complex and often controversial change agenda.

The current command structure of the CF does not suggest an obvious solution to this problem and the recommended option of creating a new force generator for Joint capabilities is acknowledged as perhaps being a bridge too far in present circumstances. Nevertheless, whatever the difficulty, effective, unified and coherent leadership of the transformation process must be established as a matter of urgent and utmost priority.

In comparison to the leadership issue, the other challenges are relatively easy to manage. Improving the operational competence of CF support personnel will take time but is largely a question of leadership direction, sustained will and a modest reallocation of resources. A number of significant changes will be required within the training system, but the main difficulty will be bringing many current commissioned and non-commissioned leaders up to acceptable standards of competency. Generally speaking, their deficiencies are not their fault and this process will need to be handled with sensitivity. Nevertheless, the improvements must be made.

The development of new modeling and simulation tools will also take some time, but the problems involved are relatively simple and the costs likely to be modest. It is primarily a question of assigning priority to the work.

In the end, success or failure in managing sustainment transformation will rest upon the level of leadership commitment. If effective control of the process and efficient,

prudent use of limited resources are considered important, the conditions for success will be established: a suitable executive leader will be identified; the necessary resources will be allocated to planning and coordination; a plan will be formulated; and the required controls will be put in place and collectively respected. None of this, apart from the executive leadership question, is very difficult or complex. In the context of the very considerable sums being routinely spent on sustainment capability development, the establishment of effective strategic planning and controls is ridiculously inexpensive.

The question, therefore, is whether the CF will consciously choose its road to transformation and efficiently manage the advance, or follow a random path to get there.

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