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CANADIAN FORCES COLLEGE / COLLÈGE DES FORCES CANADIENNES  
CSC 29 / CCEM 29

EXERCISE/EXERCICE MDS

**EQUIPMENT FLEET MANAGEMENT FOR THE LAND FORCES**

By

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09 May, 2003

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## **Abstract**

The Assistant Deputy Minister (Material), heads up the Material Group that supports the Army (as well as the Navy and the Air Force) from an equipment and professional services perspective. The Material Group also provides logistics planning and operational co-ordination, as well as support to international and industry programs that they require to carry out their assigned tasks effectively.

To properly manage the acquisition and lifetime in-service support of the Land Forces' fleets of equipment requires the right mix of properly trained professionals and adequate funding as well. However, with personnel cutbacks and retention problems, as well as increased budgetary limitations, this task has become increasingly difficult.

Although the Material Group provides a valuable service to the Canadian Forces, efficiencies can possibly be realized by the Material Group in certain areas such as the allocation of resources, partnering with industry and procurement cycle time, to name a few, that will enable the Material Group to maintain the high quality of service provided while still respecting budget constraints.

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## **Introduction**

All businesses, whether large or small, are made up of people who are working to achieve the goals of their employers. Depending on the nature of the business, the goals can be to deliver goods or services or both. In order for the business to survive in today's highly technology-based society, the business must be extremely efficient, not only in how it manages its products but in the management and utilization of its employees as well.

From the basics of business management, vision, clear and achievable goals as well as sound budgeting, forecasting and tracking are all required in order for a business to run efficiently. In today's highly competitive environment, if a business is not competently managed and run, it will not survive.

Modern militaries are now considered to be businesses; at least from the perspective of how they are administered. Budgets play a key role in what capabilities a military can have and how long they will be maintained. With the soaring costs of acquiring and maintaining today's high technology-based military systems coupled with budget reductions, managing a military like a business so as to realize all the efficiencies possible is critical.

With the end of the Cold War and the push for a more globally focused economy, modern militaries have experienced budget cuts as today's society is trying to do more with less. From a Canadian perspective, the days of deficit spending have passed and over the last several years, the military importance, at least from a budgetary perspective, has fallen. However, the number of tasks that the Canadian military has been called upon

to perform has not decreased. This has led to insufficient funds from which the military can conduct its mandate.

The budget for the Department of National Defence (DND), although extremely complex, can be roughly broken down into three components; Capital Acquisition (new projects), Operations and Maintenance (long-term support) and Personnel (both military and civilian). With the budget cuts as mentioned above, many planned projects to acquire new capabilities or to upgrade existing equipment were cancelled as they were deemed unaffordable in the new smaller budget.<sup>1</sup>

The Department of National Defence is a large employer of personnel both military (as one would expect from a military organization) and civilian as well. With the budget cutbacks as mentioned earlier, cuts in personnel have taken place to reduce the salary wage envelope (SWE) that represents part of the overall DND budget. To plan and put in place the mandated personnel cutbacks, the Material Group reengineering initiative began in June 1994 as Operation EXELERATE. The mission of the project (Operation EXELERATE) was to deliver the most cost-effective and efficient support to Canadian Forces operations by driving fundamental changes to the material acquisition and support processes and organizational structures. The scope of the work covered by the project included the material acquisition and support business from the front line operations to industry throughout the material life cycle. The personnel cutbacks achieved by the Material Group fell in line with the direction received; however, there was not a proportionate reduction in the workload that existed.

The last component in the budget as detailed above is long term support of existing equipment. Although referred to as Operations and Maintenance or O&M, from

a fleet management perspective it is also called National Procurement (NP) as a large portion of this sub-component of the budget involves the centralized procurement of spare parts to support the Canadian Forces' equipment. With the budget cuts that were discussed above, the allocation of funds for NP was also reduced leading to support problems for some equipment fleets.

With the severe cuts in equipment, personnel and budgets experienced over the past several years, the Department of National Defence has been trying to remain as close to current as possible from the perspective of performance and capability as stipulated in the Defence White Paper:

Canada needs armed forces that are able to operate with the modern forces maintained by our allies and like-minded nations against a capable opponent... The challenge will be to design a defence program that delivers capable armed forces within the limits of our resources. By making difficult choices and trade-offs, we will be able to preserve the core capabilities and flexibility of a multi-purpose force. This force will enable Canada to attend to its security needs, now and in the future. <sup>2</sup>

With this mandate in mind, changes have been implemented not only in how DND manages existing equipment and infrastructure, but in how the Department acquires new equipment all in support of the Canadian Forces. The 1994 *Defence White Paper* states that "The primary obligation of the Department of National Defence and the Canadian Forces is to protect the country and its citizens from challenges to their security." <sup>3</sup>

Canadian businesses have a critical role to play in the delivery of material to the Canadian Forces. They participate in the supply of everything from computers and radios to military clothing, weapons and ammunition, cars and trucks, armoured fighting vehicles, aircraft, ships and submarines. The provision of quality, timely and efficient material is essential to maintaining a credible military capability. This service is representative of the collaboration that exists between Canadian companies, international industries and the Department to ensure that the right equipment is provided when needed.

Material engineering and support staffs oversee the life-cycle management of military equipment including when it is to be maintained, where it will be maintained and how it is to be maintained, repaired or upgraded over the equipment's useful life. Material support services are carried out in varied locations worldwide including the business locations of the companies providing the service, at headquarters in the National Capital Region, at Canadian Forces Bases across Canada, and internationally wherever Canadian Forces (CF) members are deployed. The core maintenance activity of repair and overhaul of DND/CF assets is ideally suited to electronic business solutions that will enhance after sales equipment service by providing integrated and easily accessible information to improve equipment maintainability and supportability.

This paper will examine how the Canadian Forces manages its equipment fleets from acquisition through in-service life to disposal (from cradle to grave). To do so this, the hierarchy of the Department of National Defence will be explained as well as the delineation of responsibilities. The Department's budgeting process will then be reviewed from a macro level followed by an explanation of some of the budgetary sub-components.



Then, a description of the Department's acquisition process will be given to show how requirements are identified and capabilities acquired. Following this, in-service support of the Department's fleets of equipment will then be explained, from a management perspective, with a focus on the Land Forces' fleet management practices.

Some of the strengths and weaknesses of DND's equipment fleet management system will be highlighted with an aim not for criticism, but rather to identify areas that possibly require attention that could lead to improvement in efficiency. So as to draw a comparison to the Canadian system, fleet management, as it is performed in the United Kingdom (UK) by the Ministry of Defence (MOD), will be explained. To add to the comparison, a brief description of the fleet management system in place to support the United States (US) military will also be given. Using the UK and the US systems for comparative purposes, recommendations will be made on how the Canadian Forces and the Department of National Defence could possibly improve its equipment fleet management system.

After summarizing this paper's details, recommendations will be made, based upon the research done, as to where the Department of National Defence could more efficiently manage the fleets equipment that are operated by the Land Forces. Although these recommendations will mainly focus on the personnel side, they will cover all aspects of the DND budget. This paper will finish off with conclusions that will support the thesis that, from a resource allocation perspective, that the Department of National Defence (specifically the Material Group) could more efficiently manage the Canadian Land Forces' equipment fleets through the entire life cycle of the equipment.

## **Background**

The Army and the Department of National Defence repair and maintain equipment, shelter and sustain personnel and produce the infrastructure and capabilities necessary to support military operations. Force sustainment encompasses the series of results that the Army must achieve in order to provide the Deputy Chief of the Defence Staff (DCDS) with land force capability able to conduct operations and tasks. Part of this sustainment includes the acquisition, support and disposal of all the equipment required for the Army to properly perform the missions assigned by the DCDS.

The Material Acquisition and Support (MA&S) business employs 38,000 personnel across organizations in virtually every capability component of the Department of National Defence. The Department allocates \$5.5B annually to the MA&S process (approximately 52 percent of the total 2001 DND budget), of which \$2B is for capital equipment.<sup>4</sup>

Although the Army's operating budget represents roughly 7% of the defence budget, the Army owns about 46% of the Department of National Defence/Canadian Force's infrastructure, which includes everything from buildings to bullets.<sup>5</sup> Even though the buildings and land make up a large part of the infrastructure, the focus of this paper will be on the fleets of equipment operated and maintained by the Army only.

In order to maintain the massive amounts of equipment that the Army requires to operate, it is necessary to anticipate usage rates and create a 'warehouse' of not only supplies but of service providers as well. These supplies and services are grouped together for budgetary purposes and together are called National Procurement.

Unfortunately, “since Program Review 94, the Army has under-funded NP, initially at about 10% a year, but more recently at about 30%.”<sup>6</sup> This under-funding has led to shortfalls of “\$92 million to \$134 million from 2001 to 2003 and it is anticipated that 2004 will see a shortfall of approximately \$152 million.”<sup>7</sup> It is these existing and forecasted shortfalls that necessitate more efficiencies to be introduced in the Department’s management of its equipment fleets.

### **The Department of National Defence**

The Canadian Forces has slightly less than 60,000 members in the Regular Force and about 20,000 in the Primary Reserve Force. These military personnel form part of the Department of National Defence, which also employs about 20,000 Public Servants.<sup>8</sup> Like all government of Canada departments, DND is headed up by a minister. Some, but by no means all, of the duties of the Minister of National Defence (MND) are to manage and direct the Canadian Forces on all matters relating to national defence, with specific responsibility for the construction and maintenance of all defence establishments and works for the defence of Canada and research relating to the defence of Canada, and to the development of and improvements in material. “DND exists to carry out the work assigned to the Minister of National Defence, so the department’s relationship with the CF is that of a support system.”<sup>9</sup>

The Deputy Minister (DM) of National Defence is the Minister's most senior civilian advisor on all departmental affairs of concern to the central agencies of the federal government (such as the Privy Council Office, Treasury Board and the Public Service Commission).

The Chief of the Defence Staff (CDS) is the senior member of the CF, and the senior military advisor to the Minister of National Defence. The CDS is responsible for the conduct of military operations and for the readiness of the CF to carry out the tasks Parliament assigns to DND. The CDS issues all orders and instructions to the CF, and is responsible for all CF personnel matters.

Referring to figure 1, the Deputy Minister and the Chief of the Defence Staff both report directly to the Minister of National Defence. From a hierarchal perspective, below these two positions are all of the various group principles; also known as the Level 1s. Level 1s are civilians and military generals (Lieutenant Generals) at the assistant deputy minister (ADM) level, these include, among others, ADM(Information Management), ADM(Infrastructure and Environment) and ADM(Science and Technology). Another of the Level 1s reporting to the Deputy Minister is the Assistant Deputy Minister of Material or ADM(Mat). ADM(Mat) and the Material Group will be discussed in detail later in this paper.

The Vice Chief of Defence Staff (VCDS) and the Deputy Chief of Defence Staff (DCDS) both report directly to the CDS. Their collective responsibilities include, but are not limited to, the running of the Canadian Forces from the perspective of budget allocation and approval, personnel, and operations (abroad and at home). Also in the Chief of Defence Staff's chain of command are the Chief of the Maritime Staff (CMS)

and the Chief of the Air Staff (CAS) who are responsible for the Navy and the Air Force respectively. The Chief of Land Staff or CLS, who also reports directly to the Chief of the Defence Staff, is responsible for the Land Forces (the Army), including the Director of Land Requirements (DLR).

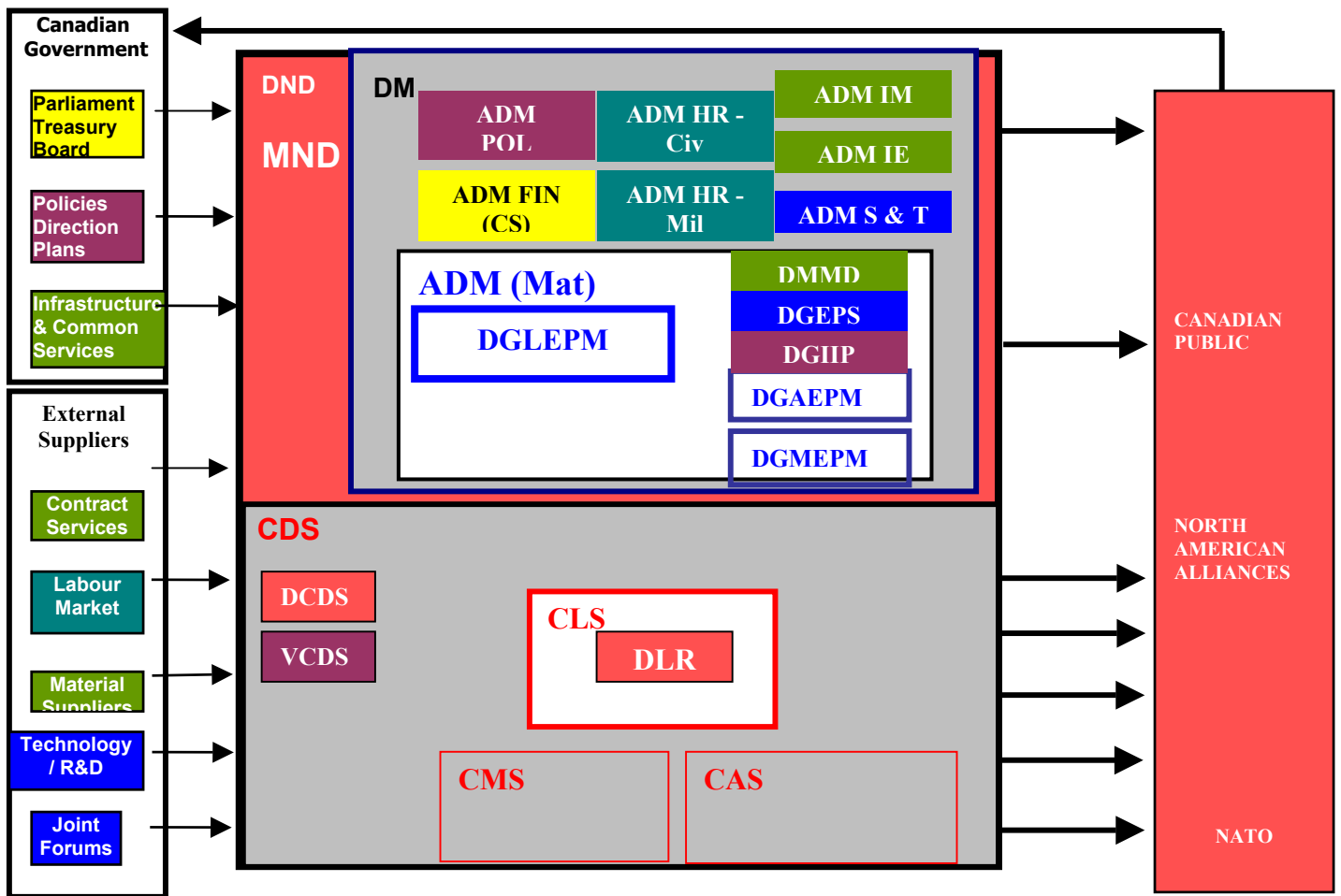


Figure 1. DND Organization Chart (figure taken from MASIS Benefits Study)

## **The Land Forces**

Canada's Land Forces (also known as the Army) is one of the three services making up the Canadian Forces (Maritime Forces or the Navy and the Air Force are the other two services in the Canadian Forces). The Land Forces website gives a brief description of Canada's Army and its role as:

Canada's army is the land element of the unified Canadian Forces (CF). Made up of Regular and Reserve (Militia) components, the army's primary purpose is to defend the nation and, when called upon, to fight and win in war. The army fulfils this function when it maintains a military deterrence capability which is credible and visible during peacetime, and by being able to undertake combat operations if deterrence fails. Although the sea and air elements of the Canadian Forces have a similar role and are equally vital for national defence, the army alone possesses the capability to seize and hold ground, dominate terrain, and physically protect land-based resources and people. As such, it is a strategic and decisive element of national power. At the same time, the army's members constitute a unique subset of Canadian society. Although governed by the imperatives of military professionalism, being citizen volunteers they are, and must remain, reflective of the fundamental values of Canadian society. It is within the context of reflecting and defending those values that the army serves the nation and fulfils its purpose.<sup>10</sup>

The Material Group supports the Land Forces (as well as the other two services) from an equipment and professional services perspective.

## **Assistant Deputy Minister (Material)**

The Assistant Deputy Minister (Material), heads up the Material Group. The mission of the Material Group as stated in the ADM(Mat) business plan is "to provide the

Canadian Forces and our other clients with cost effective material acquisition and support services, today and for the future”.<sup>11</sup>

The Material Group’s mission supports the overall DND mission, which is “to defend Canada and Canadian interests and values while contributing to international peace and security”.<sup>12</sup>

Referring to figure 2, the Material Group provides support to the Canadian Forces throughout the Strategic Planning Process, but especially in the design, build and manage stages. As well, the Material Group provides logistics planning and operational coordination, and support to international and industry programs that they require to carry out their assigned tasks effectively. ADM(Mat) also provides Material Acquisition and Support (MA&S) to all Environmental Chiefs of Staff (LGen and equivalents who head up the Army, Navy and Air Force)) and Group Principals (those at the Assistant Deputy Minister level) in the Canadian Forces and the Department. In the Material Group, each Branch/Division (including the Director General Land Engineering Program Management or DGLEPM division) consults with the Environmental Chiefs of Staff (including Chief of the Land Staff ) and the Group Principals to prioritize the requirements through various forums as outlined in the paragraphs that follow.

## **Army Strategic Planning Process 2000**

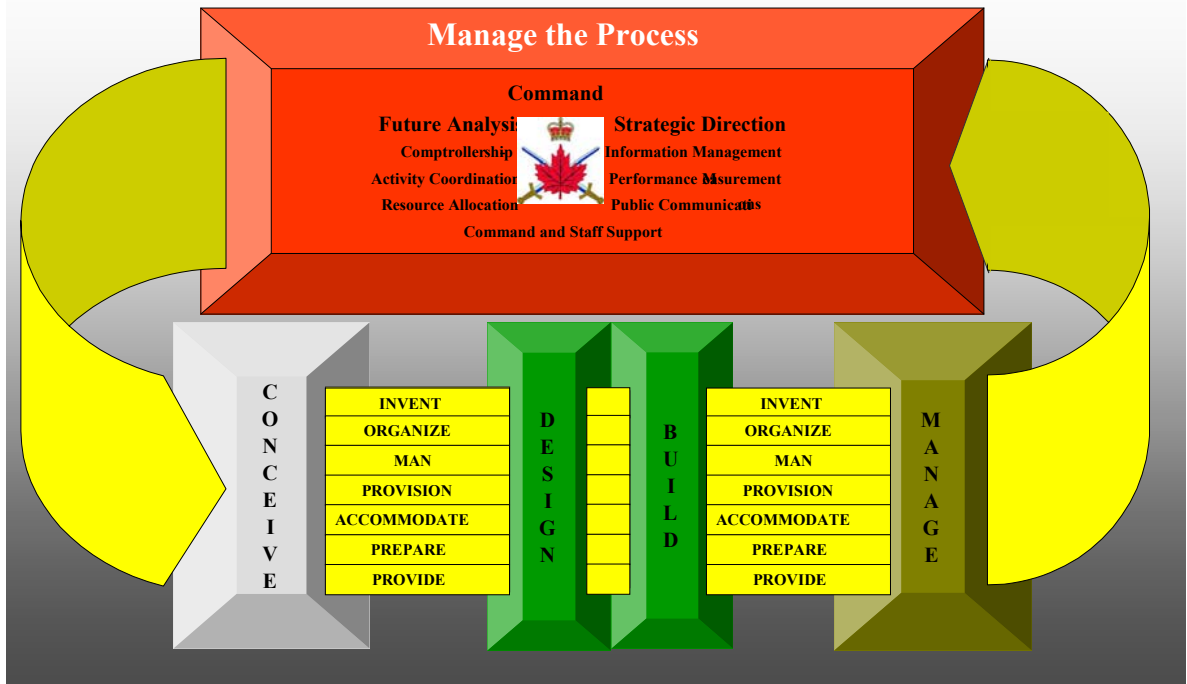


Figure 2. Army Strategic Planning Process (excerpt from speech by LCol S. Brennan)

Consultation also occurs at the Group and Divisional levels with Environmental Chiefs of Staff personnel for periodic reviews (ie, National Procurement Review, Capital Reviews, Budget Reviews, etc). Consultation occurs, as well, on an ad hoc basis as issues arise that require Environmental Chief of Staff and Group Principal input.

The Material Group is responsible for ensuring effective material acquisition and logistics support to the Canadian Forces and the Department of National Defence. This involves a major role in the planning and implementation of the Long-Term Capital Equipment Plan to acquire new equipment, the National Procurement Plan to sustain in-service equipment, and logistics planning and support operations in general, including:

- a) developing and managing the material acquisition and support process for the Canadian Forces and the Department;



- b) developing and implementing logistics plans in support of the operational deployment, sustainment and redeployment of the Canadian Forces;
- c) contributing to the development of both Capital acquisition and National Procurement support plans and managing the budgets of these two corporate accounts;
- d) controlling and administering approved equipment projects;
- e) maintaining overall design authority of the Canadian Forces' equipment and systems and providing certain aspects of engineering and maintenance, repair and overhaul;
- f) disposing of equipment; and
- g) overseeing defence material relations with other government departments and agencies, and with other governments and international organizations.<sup>13</sup>

Another important responsibility for the Material Group is dealing with industry. The Material Group must regularly liaise with industry to determine capabilities that can satisfy the needs of the CF. Most material procurement in support of DND (as well as other departments), whether they be for new capital equipment or for spare parts in support of existing equipment, are executed by requisitions through another federal department, Public Works Government Services Canada (PWGSC). In the Chief of Review Services' report in 2002, it was noted that a reduction in the procurement time, which is the time it takes to go through the complete process to identify, design, build and deliver capabilities to the CF (which includes a portion of work allocated to PWGSC for contracting) could possibly translate into savings for ADM(Mat).<sup>14</sup>

As shown in figure 3 below, the Material Group is organized into divisions that support the Army, Navy and Air Force, among other areas, as depicted in the organizational chart below (figure 3).

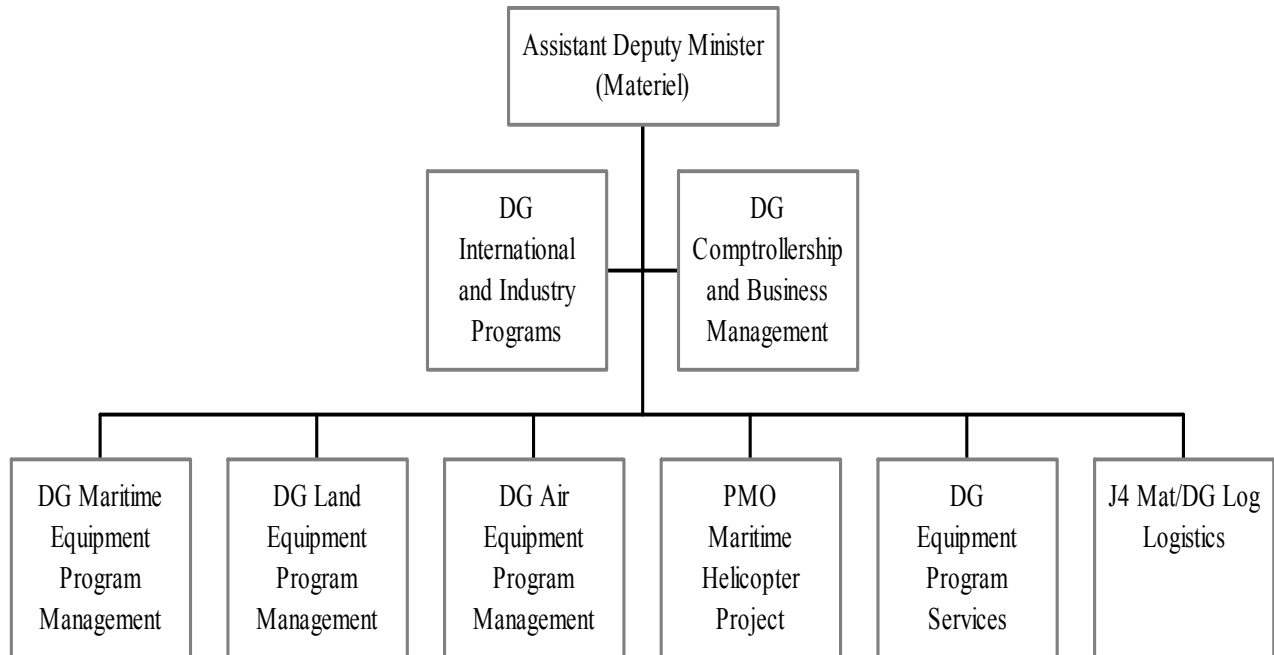


Figure 3. Organization Chart Material Group (figure taken from 2001ADM (Mat) Business Plan)

To achieve the Material Group vision, there are key attributes, together, comprising the Material Acquisition and Support Doctrine, that define the material business of the future:

- a) assuring that the right item or service is delivered to the right location, at the right time, at the right cost with the right support;
- b) focusing and leveraging industry's and other defence allies' best practices to streamline acquisition and support management, facilitated by an MA&S command and control System such as the Material Acquisition and Support Information System (MASIS);
- c) determination of weapon and system support requirements based upon the operational usage and industrial base implications of each weapon system. Where it makes sense, the Material Group will exploit the potential to shift traditional public/private relationships to properly tailor weapon system support; and
- d) influencing equipment acquisition programs through the identification of emerging technologies, development of new technology, and rapid

introduction of new technological capability into the operational environment.<sup>15</sup>

As was stated earlier, the Material Group is responsible for the acquisition and maintenance of equipment in support of the Canadian Forces. To perform this management function, a budget is required. Tables 1 to 3, which are taken from the ADM(Mat) Business Plan, depict how ADM(Mat) apportions the Material Group budget.

Table 1 - Corporate Accounts Controlled by the Material Group (Canada, 2001ADM (Mat) Business Plan)

	Planning Levels		
	Indicative	Notional	
	FY 2000/2001	FY 2001/2002	FY 2002/2003
<b>Vote 1 Corporate Accounts</b>			
National Procurement [ADM(Mat)]	1,320,000,000	1,400,000,000	1,480,000,000
<b>Vote 5 Corporate Accounts</b>			
Capital Equipment [ADM(Mat)]	1,529,171,000	1,541,759,000	1,523,159,000
Ammunition [ADM(Mat)]	2,420,000	2,466,000	2,466,000

Table 2 - Output Resource Views (Canada, 2001ADM (Mat) Business Plan)

Output	Indicative FY 2000/2001			
	Operating Budget	Military Pay	Capital	National Procurement
Maritime Equipment Program Management	12,531,000	7,133,909	317,442,000	182,701,000
Land Equipment Program Management	16,506,000	1,547,935	647,437,000	232,621,000
Air Equipment Program Management	10,230,000	26,553,004	429,138,000	481,666,000
Common Equipment Program Services	37,311,000	7,718,760	127,654,000	339,185,000
J4 Support/Logistics Support	23,148,000	18,890,230	0	63,568,000
Material Comptroller-Ship and Business Management	34,946,000	6,722,984	7,500,000	2,968,000
International and Industry Programs	2,058,000	336,505	0	0
<b>Total</b>	<b>136,730,000</b>	<b>80,903,327</b>	<b>1,529,171,000</b>	<b>1,320,000,000</b>

Source: 2001 ADM(Mat) Business Plan

Table 3 - Apportioned Corporate Accounts for the Material Group Controlled by Other Groups (Canada, 2001ADM (Mat) Business Plan)

	Planning Levels		
	Indicative	Notional	
	FY 2000/2001	FY 2001/2002	FY 2002/2003
<b>Vote 1 Corporate Accounts</b>			
Military Pay [ADM(HR)]	103,284,000	104,833,000	106,406,000
National Procurement [ADM(Mat)]	148,422,000	152,580,000	167,125,000
<b>Vote 5 Corporate Accounts</b>			
Non-Strategic Capital [ADM(Mat)]	Controlled by VCDS/DGSP		

Source: 2001 ADM(Mat) Business Plan

Although somewhat daunting, the previous tables were provided to describe the complex budget of the very diverse Material Group. The specific numbers that should be taken away from these tables are that the Material Group 2002/2003 budget for Capital Equipment, National Procurement and Personnel (both military and civilian) are approximately \$1.52B, \$1.48B and \$200M respectively.

One of the objectives that ADM(Mat) has identified in his business plan is “To maximize defence capabilities through the efficient and effective use of resources.”<sup>16</sup> To do this, the Material Group plan is to: “Provide the CF and the Department with cost-effective material acquisition and support through research and development; maritime, land and air equipment program management; common equipment program Services; logistics support; and international and industry programs.”<sup>17</sup> All of these goals stem not only from the mandate of the Material Group but also from the cutbacks during the 1990s that had reduced ADM(Mat)’s personnel and operating budgets.

As was depicted in the Material Group organizational chart earlier, ADM(Mat) is responsible for the equipment acquisition and support for all three services in the Canadian Forces. Although similar in many respects and different in others, the divisions that support the Navy and the Air Force (DGMEPM and DGAEPM respectively) will not be discussed further in this paper.

## **Director General Land Equipment Program Management**

The Director General of the Land Equipment Program Management (DGLEPM) division is accountable for the equipment acquisition and support within the Material Group Acquisition and Support Process in support of the Land Forces. DGLEPM is the design, maintenance and acquisition authority on all Land Equipment Program Management (LEPM) matters, and develops business plans to ensure the continued support of assigned CF equipment requirements. Specifically, DGLEPM is responsible for comprehensive LEPM activities, including development, acquisition, in-service support, and contributing to the development of requirements definition.<sup>18</sup>

The mission of DGLEPM is “To deliver an integrated cost-effective Land Equipment Program in order to sustain multi-purpose combat capable forces.”<sup>19</sup> To achieve this mission, the division is organized into several directorates with the full mandate of the division apportioned as per the directorate specialization.

DGLEPM has developed the Equipment Management Team (EMT) concept, which utilizes dedicated teams to manage each weapon system or group of weapon systems. Due to the staff shortages already mentioned, the EMT is only able to conduct a high-level management overview of the equipment and to maintain financial control of contractor spending. As an interim measure and part of the Alternative Service Delivery initiative that will be discussed later in this paper, several ADM(Mat) projects have employed technicians as well as service providers contracted from the original equipment manufacturer (OEM) to perform fleet life cycle management functions.<sup>20</sup>

As part of the EMT concept described above, DGLEPM employs military and civilian full time employees (FTEs) to perform in-service support of the equipment fleets that DGLEPM manages. Shortages of FTEs (which will be explained more later) have necessitated that DGLEPM augment the equipment management teams with contracted subject matter experts (SMEs). These SMEs are brought in to support DGLEPM on short term (usually 1 – 3 years) contracts. Funding for these contracted personnel is provided through the National Procurement portion of the DGLEPM budget.

From an equipment acquisition and support basis, the Director of Land Requirements (DLR) is responsible for the Land Forces' present and future requirements. As such, DLR represents the end user (the soldier in the field) from an equipment management perspective and is DGLEPM's main customer for each of DGLEPM's EMTs (note that each EMT has a DLR representative as part of the team). Whether for new equipment acquisition or in-service support, DGLEPM provides the project management expertise (engineering, financial, procurement, etc.) and DLR provides the project direction (requirements definition, test and evaluation, etc.) and together, they form the integrated equipment management team.

### **The Budget**

Budget allocation from the government to the department through ADM(Mat) to DGLEPM is done using Business Plans. Business Plans are written and followed to

clearly identify the resources that will be applied to specific tasks in support of the mandate for both the unit writing the business plan and the next higher unit as well.

The DGLEPM budget is broken down into three main sub-components, Capital Equipment, National Procurement and Personnel. Although there are other sub-components, this paper will focus on the three listed above.

### **Capital Equipment**

The Canadian Forces is a diverse organization with a variety of equipment required to fulfil their mandate. This equipment is constantly changing and requires several upgrades throughout the useable life. The Capital Program is designed to satisfy the CF's equipment needs within the Department's budget constraints. The vehicle by which the Capital Program is expressed and through which individual project approvals are sought is the departmental Long Term Capital Plan (LTCP). To meet the budget requirements of the Treasury Board (TB), the Department LTCP is designed in two separate parts:

- a) LTCP (E) - Aggregates all Capital Equipment projects including IM/IT; and
- b) LTCP (C) - Aggregates all Capital Construction (Infrastructure) projects.<sup>21</sup>

“The Departmental Long Term Capital Plan describes the content of the Capital Program in accordance with the resources identified in the Defence Planning Guide (DPG) and links it to the achievement of desired defence outcomes and policy.”<sup>22</sup>



The Land Forces are constantly under pressure to upgrade or replace aging equipment fleets. As part of the long term planning process, future needs are forecasted and identified in the Defence Services Program (DSP). “The DSP is the total of all departmentally approved activities and projects, which are deemed to be essential to the delivery of affordable and effective defence services to the Government and Canadians. The DSP conforms to government policy and is expressed in resource terms.”<sup>23</sup>

To acquire new equipment that has been identified in the LTCP(E) and which will address the capability deficiencies identified by the Chief of the Land Staff’s organization, ADM(Mat) utilizes the departmentally mandated Defence Management System (DMS). “The DMS is the departmental framework that ensures the effective and efficient delivery of the Defence Services Program. The DMS features clear strategic direction, defined resource levels and business planning as key tenets.”<sup>24</sup> The system provides managers with greater financial stability, increased control over expenditures and the flexibility to transfer funds from one resource planning element to another (principally through the business planning process).

“Funds are allocated to Level One Managers who must operate within the resources apportioned to them. The basis of the DMS is the PRAS, which outlines the Departmental business lines and overall performance measurement strategy.”<sup>25</sup>

Two Objectives of the DMS are to provide for the effective delivery of the approved program (the DSP) within the assigned resources provided to DND by Parliament and to allow the Department to effectively manage with change.<sup>26</sup> In order to achieve these objectives, timely and effective decision-making is fundamental to the process and therefore DND/CF staffs must be cognisant of the importance of providing

relevant and reliable information in a timely manner to the appropriate decision makers. Furthermore, in order to deliver the DSP within assigned resources, DND/ CF staff must recognize the need to develop and implement trade-offs. This means that in order to undertake a new activity or project, some existing activity/project(s), which consume the same level of resources, must be curtailed or considered for deletion from their current program of activities/projects.

The Defence Planning Guide identifies the tasks to be performed by the Material Group.<sup>27</sup> The Department allocates a budget to the Material Group in order for ADM(Mat) to manage Personnel, Operations and Maintenance (O&M), Capital, and National Procurement (NP). The pressure on the National Procurement account is expected to continue in the near future unless the Government provides additional funding. The National Procurement account pressure has a direct link to the Material Group operating budget because of the impact of NP work on the people who provide the services to the NP clients.

Another difficulty that could possibly affect how the Material Group will be able to support the Long Term Capital Plan (the prioritized list of future capital projects for the CF) is that the Department has been contemplating examining the role of the Canadian Forces with an aim of introducing refinements. “This has made it difficult for CLS to identify the Army’s new Capital Equipment needs to ADM(Mat) as the future role of the Land Forces may be subjected to changes depending on the refinements that may or may not be identified.”<sup>28</sup> However, even with this uncertainty, CLS and his staff continue to work hard with the Material Group to plan for the future equipment needs of the Land Forces.

Managing the approved capital program without clear priorities will continue to exert pressure on Material Group resources that support the capital program. “Once clear priorities are set in the Strategic Capability Plan and Long-Term Capital Plan, pressure on resources should lessen somewhat when resources are focused on the departmental priorities.”<sup>29</sup>

### **National Procurement**

Once equipment is brought into service, it must be maintained over its in-service life. National Procurement is a business planning and budgetary term used to describe the funding and operations and maintenance (O & M) activities required to support the various equipment fleets.

Level 1 advisors, in conjunction with ADM (Mat), prioritize their requirements against their apportionment of the National Procurement (NP) program, to align expenditures with available funding and business plans. “The NP priority system is designed to facilitate departmental NP resource levelling and the effective apportionment of scarce resources.”<sup>30</sup>

National Procurement represents one of the three main components of the DGLEPM budget. Even though the NP funding is part of the DGLEPM budget, the owner of the equipment for which the funds are intended is the Chief of the Land Staff (CLS) and it is he and his staff who set the spending priorities. Although direct links exist between the two staffs (DGLEPM and CLS), the primary consultation process that

DGLEPM uses with the CLS is conducted through the Land National Procurement Working Group. “The Land National Procurement Working Group conducts approval meetings that are co-chaired by the Director General Land Force Readiness (DGLFR) and Director General Land Equipment Program Management (DGLEPM). The meetings are conducted at the conclusion of a six-month consultation process between Directorates and the Environmental Chiefs of Staff and the Group Principals they serve.”<sup>31</sup> With reduced NP funding, these meetings become more and more difficult as scarce resources must be stretched thinner and priorities further scrutinized. The pressure in the National Procurement account is expected to continue in the near future unless the Government provides additional funding.

A further burden on the National Procurement funding is that NP is used to compensate for the lack of salary wage envelope (the funding identified for personnel salaries). Contractors are hired to augment the understaffed equipment management teams. Using this NP money to fund contractor support impedes the Material Group’s ability to adequately manage the CF equipment fleets within the NP budget allocation.

## **Personnel**

“Over the past several years, the Department has relied increasingly on service contracts to obtain many of the skill sets lost through the refocusing on core services and downsizing. Contracting can be an attractive alternative to managers faced with a public service staffing regime, which has been acknowledged to be inflexible, if not out-

dated.”<sup>32</sup> In fact, it was noted by the Chief of Review Services (CRS) that the growth in service contracting, with DND annual expenditures for professional and technical services, increased by 26 per cent over the period FY 1994/95 to 1999/00. In this respect, the CRS identified “...a significant increase over the past five years in the use of, what we have termed, Professional Help Brokers. These firms provide needed expertise "at arms length" and have become intermediaries in the process, adding cost, but often little additional value.”<sup>33</sup>

The CRS found that:

...the lack of, or the lack of knowledge of, longer-term Human resources (HR) strategies, frequently results in managers opting for reactive solutions to their resource requirements. Accordingly, the risks associated with these solutions are only evaluated on the basis of individual contracting transactions. Short-term contracting solutions often evolve into longer-term arrangements, and only when these can be considered at the corporate level do the greater risks become evident. These risks include: the emergence of key competency gaps; statements of work that are not sufficiently differentiated from the work of employees; and, potential damage to employee morale.<sup>34</sup>

Although the CRS audit was conducted on the Department as a whole, many of the findings were equally applicable to DGLEPM. The staff cuts that were brought on in the mid 1990s as part of Operation EXELERATE and the bureaucratic system to hire new personnel into the public service have necessitated bringing in contracted subject matter experts (SMEs) which were originally planned to be a short term fix. However, in DGLEPM, the contracting for EMT augmentation continues to burden the NP funding and until more fulltime employees (FTEs either military or civilian) can be hired and trained, the problem will continue.

Another concern with short-term contracting for professional services is the risk of developing an “employee/employer” relationship. A manager must only task contracted personnel to perform the services detailed in the statement of work (SOW). If the SOW is not followed or if it is exceeded in the level of effort tasked on a regular basis, contractual problems may arise such as the contracted personnel claiming employee status (benefits, entitlements, etc.). This problem could be further exacerbated if the short-term contracts are continually renewed thereby becoming long-term contracts. As there are a large number of contracted personnel embedded in DGLEPM’s EMTs, this is an area that must be watched closely. If the workload demands that contracted support must be provided on an ongoing basis, full time employee (FTE) positions should be created and staffed.

### **Alternative Service Delivery(ASD)**

With the budget cuts and personnel reductions discussed earlier, changes were required in how the business of equipment fleet management was to be conducted. Prior to 1995, most of the engineering, maintenance, procurement and supply-related aspects of equipment support were conducted in-house, by Material Group full time employees. Equipment acquisitions were structured around this standard DND support concept. That is, acquire the systems with initial spares and provide life cycle support primarily from within the Material Group’s capabilities to do fleet and configuration management, maintenance, engineering and test and some Repair and Overhaul at DND workshops.

Since 1995, the drastic reductions in personnel establishments (number of full time employment personnel in each unit/organization) have mandated that in order for the Material Group to carry out its responsibilities, greater reliance on industry for equipment support was required. Historically, much of the maintenance work to support the Land Forces' fleets of equipment was performed in Montreal at the 202 Workshop Depot, which is a direct report to DGLEPM. "However, the 202 Workshop Depot no longer has sufficient production capacity to support all the equipment fleets, nor in-house engineering capability to sustain all the equipment in all the fleets no longer exists."<sup>35</sup> The level of sophistication of the weapons systems has increased the time and cost to develop productive technical and engineering personnel who continue to leave DND faster than they can be replaced. As a result, the Department no longer has the capability to perform the life cycle support required by all of the equipment fleets. It was therefore proposed to provide support to some of the new fleets being introduced through an alternative service delivery system.

As stated in the Department of National Defence *Policy on Alternative Service Delivery*:

Alternative Service Delivery is but one of several performance enhancement solutions available within the continuous improvement framework. An alternative service delivery solution replaces an existing departmental service delivery mechanism with one that does not reside as a traditional organizational structure within DND. Typically, an alternative service delivery solution will result in a change in employment status for those employees so affected. Note that initiatives undertaken to create new capabilities or augment existing capacities do not fall within the realm of Alternative Service Delivery.<sup>36</sup>

The Department of National Defence is committed to the continuous improvement of all its activities and processes in order to better support and enhance CF combat capabilities and to ensure the most efficient use of public resources. All managers/leaders are responsible for reviewing processes within their areas of responsibility and taking necessary actions to improve effectiveness and efficiency so that departmental standards are achieved. The attainment of these standards may be reached through a variety of internal or external solutions depending upon which approach is most appropriate for a given situation. Alternative Service Delivery is one of the options available to managers within DND's continuous improvement framework.

In its *Policy on Alternative Service Delivery*, the Department has stipulated that an ASD option should be considered when:

- a) the private sector offers greater capabilities than the Department can achieve on its own. Greater use of the private sector may allow access to additional resources, or a wider range of experience and expertise. Effective commercialization contributes to the expansion of the defence industrial base and the nation's ability to sustain the CF during times of military operations;
- b) an ASD solution offers better value for money, resulting in improved services, cost avoidance, less cost, or reduced personnel requirements; and
- c) an ASD solution permits greater focus on defence capability.<sup>37</sup>

From the ASD direction given, ADM(Mat) has developed the Optimum Weapon System Support (OWSS) initiative. "OWSS will examine the capability of the Material Group to manage the equipment fleets together with the external industry resources required to provide the long-term life cycle support to ensure operationally effective weapons systems."<sup>38</sup> OWSS defines and describes the support dedicated to a specific weapon system and includes the concept that a Contractor may provide some of the



support needed to augment the Material Group EMTs. Any OWSS contract generated to support equipment of the Canadian Forces will encompass some or all of the services required to manage and maintain certain fleets including the provision, delivery and management of spares.

As in most situations, one solution is not always the panacea for all concerns; the history and existing circumstances of each situation must be considered before a way ahead can be recommended. This may require several tailored solutions, should the need exist. This holds true for equipment fleet management in the Material Group as well. Therefore, to provide the required support to the Land Forces' fleets for the estimated length of their lives, three options can be considered: returning to the traditional in-house support, contract out the entire fleet support and contract out specific portions of the fleet support.

First, the return to the traditional in-house support concept: This involves the implementation of best business practices together with requests for the establishment of funding increases to cover the multiple contract management and vehicle engineering functions as well as to purchases tools, test equipment and property rights. There are several problems with this option including personnel hiring. Attempts by DGLEPM, over the last two years, to fill vacant positions have revealed a lack of individuals with the requisite skills and experience who are willing to take employment with the department as employees or contractors. Also, many of the original equipment manufacturers own the rights to a significant portion of the test equipment and the rights are not for sale because this test equipment is also used to support other non-Canadian customers.

The second option mentioned above was to contract out the entire support for certain fleets. Problems with this option include that the Army has identified core maintenance, supply and transport support activities that must be done by uniformed personnel. In addition, DND is mandated to provide Crown oversight, quality control and contract management as well as to exercise financial control over expenditures of public money by any Contractor. Thus, there needs to be at least a portion of the fleet management done by government personnel.

The last option discussed above was to contract to industry those portions of Fleet Management, Supply Support, Technical Support and Engineering Support that are justified by cost benefit analysis while retaining within the government (DND) those activities identified as core. This option takes into account the reality of DND staff shortages and is in line with Department guidance and direction to “apply the efforts of DND personnel on core activities and to focus the remaining personnel more on the “managing” than on the “doing” of equipment support activities.”<sup>39</sup> The transfer of non-core activities to a contractor will allow DND personnel to be more focused on purely DND efforts. Realities dictate that the support cannot be fully delivered from within the department due to the shortages in personnel, but this does not change the responsibility to do so. The use of contractor supplied life cycle material management, engineering management, configuration management and obsolescence management support provide improved equipment availability, more efficient allocation of resources, efficient adjustments to maintenance plans and more accurate planning for operations. The department manning levels (as FTEs) has reached the point such that the Department is

unable to perform these functions itself, without time-consuming recruitment and training. Thus, contracting out for certain portions of the equipment fleet management functions must be conducted.

Some of the aspects of OWSS will result in savings to the Department. “The concepts of contractor managed inventory and just in time delivery direct to the appropriate user, have the potential to save the costs of depot storage and handling.”<sup>40</sup> The global customer base of the proposed contractor should provide economies of scale in spares pricing and the Contractor’s global spares holdings should shorten transportation time and cost to Canadian deployed operations. In addition, the contract will challenge and reward the contractor to find ways to become more efficient and to reduce the costs of services over the life of the contract. Personnel costs, on the other hand, will be substantially higher for contractors than they would be if they were for DND employees. However, with the personnel shortages, OWSS seems to be the logical way to proceed, at least for the short term.

“There are a number of risks associated with OWSS; among them are concerns with industry’s abilities and responsiveness. Also, once implemented there will be a further erosion of in-house support capability, and challenges for the Crown to provide the necessary oversight.”<sup>41</sup>

The risks associated with industry will be mitigated by performance stipulations in the contract that are generated between the Crown and industry for the required support. Incentives and disincentives will be designed to encourage improvement and responsiveness. The structure of the DGLEPM EMTs and the personnel assignments within the teams will be modified to ensure the best possible OWSS management and

oversight. Finally, the terms and conditions of the contract will enable DND personnel to resume some of the OWSS support functions, should DND establishment increases occur in the future.

Ultimately, the development of the OWSS Statement of Work (SOW), terms and conditions, industrial benefits and costs for an equipment fleet that will lead to a request for Treasury Board (TB) contract approval will be under the leadership of ADM(Mat). Once any contract is signed to manage a Land Forces fleet, the management of the OWSS contract and activities will be under the leadership of DGLEPM, who is advised by a Senior Project Advisory Committee (SPAC). Within DGLEPM, specific directorates, depending on the nature of the Land Forces fleet, will have an OWSS management cell comprised of DND and Public Works and Government Services Canada (PWGSC) personnel, who will, in conjunction with the EMTs, ensure that the Contractor provides the required services and meets the agreed performance levels.

Whether dealing with aid to civil power here in Canada such as the Winnipeg floods and the Quebec ice storms, or peacekeeping missions in foreign locations, Canada's military are there to get the job done. Supporting them up are DND/CF's civilian and military defence workers in Canada.

The challenge for DND and the CF is to continue providing good quality support services for the military missions, while endeavouring to reduce costs, streamline business practices, acquire new technologies, and ensure that sustainable jobs are maintained. The goal is to invest in combat capability. This is where alternative service delivery (ASD) can help. ASD is one of many continuous improvement tools to help DND and the CF modernize business practices and gain maximum value for each

Defence dollar. This continuous improvement framework is now being applied to all activities and the focus is on evaluating the potential for efficiencies and effectiveness - not simply on cost savings.

Increased attention and emphasis is being placed on performance and success in reaching pre-agreed targets. In turn, this will strengthen accountability and add rigor to the process. Business Case development and analyses will help to determine the most efficient and effective delivery option. In most cases, this means improving the in-house organization using an established continuous improvement technique such as business process re-engineering, total quality management, balanced scorecard, etc.

As was discussed earlier, several options exist to address the problem of shortages in full time personnel in the Department. In some cases, the most efficient or effective means of service delivery may involve outsourcing. When these cases meet certain Treasury Board criteria (i.e. large or sensitive in nature), they must follow the Treasury Board Secretariat (TBS) ASD policy and process. The Director General Strategic Change (DGSC) has stated that the Department and the CF will continue to pursue ASD and public-private partnering where it makes sense to do so, (as a subset of the continuous improvement approach).<sup>42</sup>

### **Material Acquisition and Support**

Material acquisition and support (MA&S) form a major portion of the Material Group's mandate. MA&S is the means by which the Material Group acquires new equipment and supports it through its in-service life. In the early 1990s, it was recognized

that the Department of National Defence lacked the ability to perform end-to-end material management effectively and readily, because there was no common framework for the conduct of Material Acquisition and Support (MA&S) activities.<sup>43</sup> (Canada MASIS Implementation Strategy Introduction) This was identified as one area that efficiencies could be realized and savings introduced. The Material Acquisition and Support Information System (MASIS) project was initiated by ADM(Mat) during the mid-1990s to provide an integrated business application software package and database for the Material Acquisition & Support (MA&S) System.

The mission of the MASIS Project, as stated in the *MASIS Project Charter* is “to provide a Department of National Defence (DND) integrated material acquisition and support information system that enables the cost-effective optimization of weapon/equipment system availability throughout the life-cycle.”<sup>44</sup> MASIS will assist the material domain in achieving its overall short term objective of providing adequate services to its clients given the material domain's significantly decreased resource base.

The MASIS project has started to deliver the electronic tools necessary to manage more effectively the acquisition and support of the Department’s equipment fleets. “The MASIS Project will acquire and implement a corporate Enterprise Resource Planning (ERP) suite of fully business-integrated applications based on the functionality identified within the MA&S framework.”<sup>45</sup>

MASIS is being fielded in conjunction with other corporate projects, such as the Financial and Managerial Accounting Project (FMAP), the Canadian Forces Supply System Upgrade (CFSSU) project and the Human Resources Information System (HRIS).<sup>46</sup> Difficulties are arising from the fielding of MASIS department wide (although

it is not being conducted all at once but rather in small controlled areas starting with 202 Workshop Depot in Montreal) somewhat concurrently with the other projects listed above. Although a lot of these problems can be contributed to growing pains as many employees are well accustomed to operating with the existing legacy systems, all the projects are not yet complete and their ability to all function as expected will not be proven for some time yet.

MASIS is also a component of the Long Term Capital Plan (Information Management) (LTCP(IM)) and a key strategic initiative of the (ADM(Mat) Business Plan. As such, MASIS will contribute to the integration, standardization, and increased availability, accessibility, timeliness and accuracy of MA&S information. This information will include equipment and material assets, configuration and performance data, technical documentation, and life-cycle costs. “The implementation of these information-related improvements is expected to make significant contributions to day-to-day operations and management decision making.”<sup>47</sup>

Providing this ability for personnel to readily obtain current information in electronic form is the basic foundation of MASIS. As such, MASIS assists DND in achieving the goal of an Integrated Information Environment (IIE). Other MASIS-related benefits are expected, such as reductions in inventory, improved charge-backs (billing the user of a service as opposed to having it centrally funded) for MA&S services, and improvements to processes other than DND MA&S. These benefits cannot be quantified at this time due to the absence of available information. Being able to quantify these benefits in the future with an information system such as MASIS is, in itself, a compelling benefit.

In addition, MASIS supports the strategic business renewal objective of the Material Group, which is to increase the Group's efficiency and effectiveness in delivering material acquisition and support. Specifically, MASIS will:

- a) provide unit-level personnel with a far more effective tool for organizing, conducting, recording, and tracking maintenance activities;
- b) give workshop managers and supervisors greater access to information on all costs and resources related to MA&S tasks;
- c) provide Equipment Managers with instant access to complete and accurate equipment histories, as well as any associated technical documentation;
- d) give senior managers timely access to reliable, accurate roll-ups of all information related to the availability of MA&S resources; and
- e) provide operators with the information they require to plan and support operational missions and tasks, and enable improved equipment maintenance, availability and operation.<sup>48</sup>

Whether or not MASIS represents too big a bite out of the technology apple in too short a timeframe, especially with the ongoing work on all the other ERPs, MASIS does



represents a departmental initiative to improve the Material Acquisition and Support system which should aid the Material group in performing a portion of its mandate which is to maintain the Land Forces' equipment fleets.

### **The British System of Maintaining Equipment**

Similar to the Canadian system of alternative service delivery, the United Kingdom's Ministry of Defence (MOD) uses a system they refer to as Public Private Partnership or PPP. These partnerships offer new ways of doing MOD business more efficiently, making best use of the available skills in the public and private sectors to deliver better defence services in support of the front line.

“The MOD's approach to equipment acquisition and sustainment is pragmatic, with the emphasis on encouraging innovation through commercial and in-house solutions depending on whichever is better placed to deliver required services at best value.”<sup>49</sup> There is no predisposition towards either public or private sector; the main driver is the better use of resources in defence and the maintenance or enhancement of operational effectiveness and readiness. Projects must take that aspect into account before proceeding along with other issues such as the impact on the chain of command and service discipline.

PPP is an umbrella term covering a variety of procurement initiatives, all of which benefit from a close, and normally long term, relationship with a private sector partner.

“The main techniques are the Private Finance Initiative, (PFI), Partnering Arrangements,

Outsourcing, the Wider Markets Initiative and the Defence Estates Prime Contracting Programme.”<sup>50</sup> These initiatives will be explained later in this section.

As stated in the PFI section of the MOD website, “The Private Finance Initiative (PFI) is an important part of the Government's efficiency policy, in conjunction with other forms of Public/Private Relationships. MOD Ministers have endorsed the use of PFI to provide services throughout the Defence Department.”<sup>51</sup>

The PFI offers benefits to both MOD and potential private sector suppliers. In particular, and as stated at the MOD website, PFI will enable the MOD to obtain better value for money from existing budget allocations by:

- a) allowing MOD to focus on its core task of providing operational capability;
- b) increasing competition across a wider range of activities;
- c) taking advantage of the investment, capacity and specializations within the private sector and its skills and ability to balance cost, risk and return; and
- d) expose MOD managers and staff to private sector project, commercial and financial management skills.<sup>52</sup>

“PFI provides a service based on the creation or replacement of capital assets by the private sector and remains the cornerstone of the Ministry of Defence’s PPP programme.”<sup>53</sup> It remains their Departmental policy to consider PFI for every investment decision (such as capital acquisition) and to determine whether or not it makes sense for that investment to come from the private sector rather than from public funds. The main driver behind deciding between public and private resources is the better use of those resources in defence and the maintenance or enhancement of operational effectiveness. Projects must take that source of resources (public/private) aspect into account before

proceeding along with other issues such as the impact on the chain of command and service discipline.

One of the most important features of PFI is that it offers the MOD the potential to transfer more risk to the private sector, when it is best placed to manage it as opposed to the traditional forms of procurement. “For example, where demand for a service can vary it has been possible to specify minimum and maximum service requirements in contracts, so the MOD pays for the service it receives only when it needs it.”<sup>54</sup>

“Because payments are made to the partner only when satisfactory service is received, there is a strong incentive on the partner to deliver. A further incentive is the partner’s need to service the financing it has raised to buy the assets it is using under the contract.”<sup>55</sup> The private sector may seek to re-finance the contract once service has started and project risk has been reduced. It is important that the Department retains a right to share their resulting gains.

## **Partnering Arrangements**

“A Partnering Arrangement is a term used to describe one form of long-term contract based on the partnering ethos. It establishes a framework within which the Department’s relationship with a contractor can grow over time.”<sup>56</sup>

In a Partnering Arrangement the MOD does not necessarily need to be clear about final outcomes. Generally, such arrangements promote a developing relationship with a private sector partner over a range of possible activities. The partner is given

opportunities to achieve innovation and value for money. If he is successful, MOD is likely to expand its business with him, as he demonstrates he can meet the Department's needs efficiently and cost-effectively.

“One type of Partnering Arrangement takes the form of a Partnering Principles document defining the principal agreements between partners and a Framework Agreement within which separate tasking orders define each element of the service to be provided.”<sup>57</sup>

## **Outsourcing**

The Ministry of Defence has considerable and long standing experience with contracting out, or outsourcing, the provision of services. “Much of this was built on the Competing for Quality (CFQ) initiative, which in turn opened the way for other forms of PPP.”<sup>58</sup> These newer initiatives, including Prime Contracting and Wider Markets, which are described below, have taken the spotlight, but outsourcing remains a key method of achieving targets set under government directives, with requirements often being bundled together under large multi-activity contracts. “Outsourcing contracts are often in the order of 5 to 7 years in length. Other forms of PPP will be more appropriate when a longer term relationship is envisaged or capital investment is needed.”<sup>59</sup>

## **Prime Contracting**

Under MOD's prime contracting programme, the Ministry of Defence retains ownership and responsibility for the full capital and running costs of new equipment and facilities. "The MOD looks to a single contractor to take responsibility for the integration and management for all of the capital (equipment and facilities) supply chain aspects dealing with design and construction; including the delivery of the completed project on time, within budget and fit for purpose."<sup>60</sup>

## **Wider Markets**

"The Ministry of Defence is committed to the disposal of surplus capacity wherever practicable, but the nature of the defence business means that some irreducible spare capacity is always likely to remain."<sup>61</sup> To help deal with this, "MOD business areas have been encouraged to exploit spare capacity in their assets on a commercial basis in order to make the best use of the MOD's extensive physical (equipment, land, premises) and non-physical (intellectual property, data, skills) asset base."<sup>62</sup> So as to encourage this participation, "business areas can use the income generated by this 'Wider Markets' activity, either to support core MOD objectives, or contribute to local 'quality of life' improvements for military and civilian personnel."<sup>63</sup>

Depending on the scale and nature of the project, the MOD may decide either to undertake the commercial activity on its own, or through commercial arrangements with a private sector partner. A private sector partner can often provide the commercial and marketing expertise, and sometimes, additional capital investment, required to enter new markets and attract third party business more effectively. This flexibility must always be present as different projects can be fulfilled in different ways.

“The MOD has made increasing use of PFI and other forms of PPP in the last five years. They have one of the biggest and most diverse PPP programmes in the British Government and a large number of projects are in procurement.”<sup>64</sup> “The MOD has determined that they need to build on their experience in order to make best use of private sector finance, skills and expertise as part of the wider drive for better use of defence resources through the delivery of quality, value for money, services.”<sup>65</sup> These represent a key element is the continuing work to collate and spread best practices to examine the competences and training required to provide the right mix of skills for those delivering the increasingly complex PPP programme.

A major portion of ADM(Mat)’s alternative service delivery initiative involves partnering with industry, similar to the initiatives described above that are in place in the United Kingdom’s MOD. However, ADM(Mat)’s utilization of ASD is still somewhat new and the full effects (from a resource and service delivery perspective) have not yet been realized. Like the British initiatives of Outsourcing, Public Private Partnership and Private Finance Initiative, ASD in Canada is forecasted to provide a more efficient means of employing ADM(Mat)’s scarce resources (personnel and funding) while delivering the

required services to the Canadian Forces in a timely manner. By utilizing resources that already exist in the private sector, ADM(Mat), in a partnering-type arrangement can better support the Canadian Forces.

### **The United States' System of Managing Equipment**

Similar to the Material Group in the Department of National Defence, the United States Army utilizes the Army Material Command (AMC) for managing the acquisition and in service support of its various fleets of equipment. The mission, as stated at the AMC website is to “Provide superior technology, acquisition support, and logistics to ensure dominant land force capability for Soldiers, the United States, and our Allies.”<sup>66</sup>

“To centralize control and management of all Army inventories, AMC has been combining wholesale and retail inventories through the Single Stock Fund Program.”<sup>67</sup>

AMC, like ADM(Mat) is the single manager of Army inventories, and as such, the U.S. Army knows where everything in the Army is, even down to the unit level. Knowing where stocks are gives the Army the ability to redistribute army assets where and when they are needed. With an aim to centralize management of all army maintenance activities for components and end items, “the Army leadership has designated the Army Material Command as the Army’s National Maintenance Manager.”<sup>68</sup> By championing this effort, “AMC will establish uniform standards of performance for all maintenance activities.”<sup>69</sup>

The vision of the AMC is “Dedicated and innovative people, committed to continuously improving support to soldiers. Leading the development of new technologies and sustainment processes to transform the Army. Reshaping the workforce for the 21st century.”<sup>70</sup> AMC is the Army’s premier provider of material readiness technology, acquisition support, material development; logistics power projection (ability to support the Army where and when needed), and sustainment to the total force, across the spectrum of joint military operations. “If a soldier shoots it, drives it, flies it, wears it, or eats it, AMC provides it.”<sup>71</sup>

The command’s complex missions range from development of sophisticated weapon systems and cutting-edge research, to maintenance and distribution of spare parts. To develop, buy and maintain material for the Army, AMC works closely with Program Executive Officers, the Army Acquisition Executive, industry and academia, the other services, and other government agencies. “The command’s main effort is to achieve the development, support, and sustainment of the Objective Force (Army of the future) in this decade.”<sup>72</sup> At the same time, “AMC is key to supporting and sustaining the Interim Force (the force that will bridge the near-term capabilities gap between the Army’s light and heavy forces) and to sustaining and recapitalizing the Legacy Force (based upon existing equipment).”<sup>73</sup> Its maintenance depots restore weapon systems needed as the Army makes its way to full transformation. The command’s overhaul and modernization efforts are enhancing and upgrading major weapon systems, not just making them like new, but also inserting technology to make them better and more reliable.



As the place in the Army where superior technology, acquisition support, and logistics are integrated to assure readiness for today and tomorrow, AMC is heavily involved in making the Army more responsive, deployable, agile, versatile, lethal, survivable, and sustainable. From beans to bullets, helmets to helicopters, spare parts to spare ribs, AMC touches every soldier in the Army every day.

**AMC Goals and Objectives** (as described at the AMC website ([www.amc.com](http://www.amc.com)) are:

The first goal of the Army Material Command is to “continuously improve support to soldiers.”<sup>74</sup> Their plan to achieve this is through the implementation of several objectives including:

- a) Implement knowledge management enterprise solutions to sustain the Army, provide superior technology, and enable Army Acquisition;
- b) Institute pilot programs and improvement initiatives to positively influence material readiness; and
- c) Institute the “Lean Thinking” philosophy of management across AMC.<sup>75</sup>

Lean thinking is, as stated at the website of Simpler Consulting Inc., (a contractor hired to implement Lean training) “... a coordinated response to today’s highly competitive environment. Lean attempts to epitomize world class performance, world class practices, and a culture of relentless continuous improvement.”<sup>76</sup> Lean thinking is a concept that tries to incorporate modern thinking and a modern approach to how AMC supports the U.S. Army.

The AMC website defines Lean as:

...a philosophy and ongoing effort to reduce waste throughout every process. LEAN is not an acronym, an event or program, nor is it a list of projects. AMC's goal is to make "LEAN Thinking" the philosophical basis for deciding what products and services to provide and how to provide them. It involves the entire AMC workforce focusing on efforts to increase the value of our products and services to the end users, our soldiers. LEAN will position AMC to meet the enormous challenges of the 21<sup>st</sup> century Army and its transformation.<sup>77</sup>

To reduce the cycle time required to get new technology to the field, AMC will utilize the Lean thinking approach as identified above by looking at the flow of individual projects within the U.S. Army. Although not specifically called Lean thinking, ADM(Mat) has been, and will continue, looking at its support practices with an aim to integrate new and improved practices so as to more efficiently support the Canadian Forces. The Director Material Acquisition and Support Programme (DMASP) looks at the project management practices of the Material Group with an aim to improve efficiency.

The next goal for AMC is “to lead the development of cutting edge technologies and sustainment processes to transform the Army.”<sup>78</sup> In order to achieve this goal, several objectives were identified by AMC and they include:

- a) Execute the Logistics Transformation Campaign as the focal point and the leader for logistics;
- b) Organize AMC to successfully provide Army readiness and transformation using specific customer solutions today and anticipating war fighter needs in the future;

- c) Design future workforce, including contractors, and identify future competencies to meet human resource management and transformation challenges; and
- d) Institutionalize incentives and incentives programs to ensure best technology solutions are available for insertion into material systems.<sup>79</sup>

DMASP has been tasked to examine the business practices (including transformation, readiness, etc.) of the Material Group with input from the Director Land Equipment Resource Management (DLERM) in DGLEPM.

Another goal that AMC has identified that will aid them in the level of support they provide to the U.S. Army is to “Reshape the workforce for the 21st century.”<sup>80</sup> Some of the objectives they have laid out to achieve this goal are as follows:

- a) Design future workforce and identify future competencies against which to orient human resource management practices;
- b) Lead and manage the workforce in a manner promoting excellence, well being, innovation, and collaboration to support soldiers;
- c) Recruit and retain a workforce with skills to transition and support readiness, the Objective Force, and Army Transformation (Legacy Force to Objective Force); and
- d) Train and educate the workforce with the skills to transition AMC from industrial commodity-based work to knowledge-based integration missions.<sup>81</sup>

Although management of all major weapon systems has been transferred to the Army Acquisition Executive, AMC continues to provide acquisition support including legal, engineering, and contracting officers, to Program Managers and Program Executive Offices.

AMC is working to adopt "evolutionary acquisition," also known as spiral development. It uses available, mature technologies to produce weapons systems that will meet many, but not necessarily all, of a system's operational requirements when the

system is first deployed. A series of subsequent upgrades represent the "spirals" that increase capabilities over time. "As technologies evolve and become available, needs can be met more quickly, more precisely and more economically. Ultimately, spiral development will help keep development and requirements in sync, control costs, and offer greater opportunities for collaborative development with our allies."<sup>82</sup>

As stated by General Kern, Commanding General, U.S. Army Material Command:

We don't think out-of-the-box; we just made the box bigger and applied that thinking to Army logistics to see if we can find a new paradigm for logistics support to the objective force. The Army Science Board and AMC have been looking for new ways to streamline operations and better support our soldiers and Army readiness. We are looking for new ways to expedite the resupply of soldiers, leverage private industry capabilities and experience in fleet management for the Stryker Interim Armored Vehicle, drive down surcharges at depots and arsenals... Without a transformation in logistics there will be no Army transformation. So, the Army set up a Logistics Transformation Task Force led by AMC and the G4 to create a plan that will provide the way we transform logistics to support the objective force.<sup>83</sup>

In support of the U.S. Land Forces, the Army Material Command has worked (and will continue) to improve their equipment fleet management (acquisition and support) in order to better enable the soldiers to be ready for service today and in the future. Several of the initiatives being employed by the AMC to improve the acquisition and support are similar to those used in DND and ADM(Mat). The augmentations of the AMC full time employees (civilian and military) with contracted support, as well as the implementation of management enterprise resource planning solutions, (similar to MASIS) are two such examples.

However, the United States has taken a more aggressive approach to hiring and training of its full time employees which may be an area worthy of focus for ADM(Mat) who has experienced staff hiring and retention concerns.

With regards to management practices and project control, AMC has implemented the Spiral Development and Lean thinking concepts. Although ADM(Mat) presently employs some of the principles to a limited degree, DMASP must continue to explore these areas with an aim to determining their benefits to the Material Group's support of the CF. Until the analysis by DMASP is complete and recommendations can be implemented, firm direction can not be given by ADM(Mat).

## **Recommendations**

### **Hiring and Retention**

With the cumbersome and inflexible hiring procedures in place within the Public Service, ADM(Mat) and DGLEPM have relied upon the use of contracted support to supplement the equipment management teams that have been decimated as a result of the Departmentally mandated personnel cuts. This process, if not modified, will continue to increase (that is to say that the number of contractors working in ADM(Mat) as compared to the number of FTEs employed will increase) as more and more employees reach retirement age. Without serious efforts to hire and train new, younger FTEs in the very near future, ADM(Mat) and DGLEPM will face even more serious full time employee personnel problems. Although this problem is especially applicable to the professional areas such as engineering and finance, it is also applicable throughout most of the other employee classifications in the Material Group as well.

### **Consecutive vs Concurrent ERPs**

Several much needed enterprise resource planning (ERP) projects are ongoing in the Department, including MASIS, CFSSU and FMAP and HRIS at this time. However, this concurrent fielding effort is stretching thin the limited resources available in the

Material Group and although considerable effort has been expended to ensure interoperability, designing each project to the moving targets of the other projects is risky. Even though all of these projects are critical to the successful future operation of the Material Group, it is ill-timed that they must be fielded so close to simultaneously.

Unfortunately, it would be impractical and possibly harmful to any or all of these projects to recommend delays so that attention can be focused on fewer projects at once. Therefore, it is recommended that a team of individuals be formed that can examine the needs and direction of each of the projects and ensure that the proper level of coordination is introduced that will allow all projects to deliver the services they were mandated to provide in a timely manner. Taking into consideration the personnel problems identified earlier, this team should be formed to function as a secondary role for the team members.

### **Short Term vs Long Term Contracting**

As was stated earlier, careful attention must be paid to the conditions and durations specified in the contracts that the Material Group generates for professional services to augment the equipment management teams. ADM(Mat) management, both at the Director General and Director levels, must examine workloads and determine if the need for contracted support is actually for the short term to assist with unforecasted taskings. If it is, then contracting the work out will provide the needed short-term support and when the tasking is completed, the contract will terminate. However, if the workload

will be ongoing, then it is recommended that full time employment positions should be created and staffed with either military or civilian employees. Although the procurement staffs in the Material Group are aware of this potential source of problems, it is still worthy of mention here.

### **Partnering With Industry**

In line with what the Ministry of Defence in the United Kingdom is doing, ADM(Mat) should investigate what areas of work are being performed in the Material Group that can be shared with, or given over completely to, industry. If the budget given to ADM(Mat) to support the Canadian Forces is not increased, then efficiencies in resource allocation might be realized by enhancing the relationship that the Material Group has with industry. Although this has been attempted to a limited extent already by the Material Group, it is recommended that this area be examined further to see if additional ADM(Mat) responsibilities can be shared with industry.

### **The Budget**

Although the Department of National Defence recently received a budget increase of \$1.6 billion, this does not begin to address the extensive cuts that the Department of National Defence has had to implement in both spending and personnel. ADM(Mat) has



had to prioritize the work that can be done by the Material Group in order to remain within the constraints imposed by the budget reductions that pre-dated the recent budget increase. These cuts have severely limited the flexibility that the Material Group has to react to unforecasted taskings. If ADM(Mat) is to continue to provide the high level of service to the Canadian Forces that it does, then either the budget or personnel allocated to the Material Group will have to be increased or the list of responsibilities will have to be reduced. If either of these two choices is not met, budget overruns and/or reduction in performance from the Material Group may result. Thus, although increasing the size of the Material Group's budget (and salary wage envelope) is not within the power of ADM(Mat), he must make it clear to his superiors what the consequences will be if the Material Group does not receive the required budgetary (including SWE) increases.

### **Procurement Cycle Time**

The Material Group is responsible for acquiring new equipment as well as sustaining in-service equipment in support of the Canadian Forces. The time it takes from identifying a capability deficiency that the CF might have to actually delivering it to the troops (soldiers, seamen or airmen) is quite excessive. ADM(Mat), in conjunction with Public Works and Government Services Canada must analyze the complete procurement cycle with an aim to reducing the time it takes to acquire new equipment (including spare parts for existing equipment). Reductions in the procurement time should produce decreases in staff efforts leading to savings for the department.

## **Future Study**

Finally, on several of the other points raised in this paper, such as the U.S. Spiral Development approach to acquisition and the U.K. approach to partnering with industry, further study should be conducted by ADM(Mat)'s staff to determine applicability and benefits that could be realized to improve the efficiency of the service that the Material Group provides to the Canadian Forces.

## **Conclusion**

The Canadian Military's Land Forces, although small by the standards of some of the Army's around the World, are a large and diverse group. Their mandate, which forms an integral part of the mandate of all of the Canadian Forces is "to defend the nation and, when called upon, to fight and win in war."<sup>84</sup> To achieve this, Canada's Army must be outfitted with the right equipment that has been properly maintained. The equipment fleets that the CF owns and operates require constant supervision, from a management perspective, as they must be repaired, upgraded and/or replaced, depending on age. The management of these equipment fleets requires teams of professionals with project management, engineering, financial and procurement backgrounds in order to ensure that the equipment will properly serve the CF.

This paper has detailed the hierarchy of the Department of National Defence including the Canadian Forces so as to situate the Assistant Deputy Minister (Material) and his Material Group as well as the Land Forces and the Director of Land Requirements (DLR). Both ADM(Mat) and DLR play key roles in satisfying the CF's, and more specifically the Land Forces', equipment requirements. The task of identifying the Army's equipment needs and ensuring that they are met, falls on DLR and his team; whereas the management functions involved with the acquisition and in-service support of the equipment fleets is the responsibility of ADM(Mat) for the CF and the Land Engineering Project Management Division for the Army.

To properly manage the acquisition and lifetime in-service support of the Land Forces' fleets of equipment requires not only the right mix of properly trained professionals but also adequate funding as well. However, with personnel cutbacks and retention problems, as well as increased budgetary limitations, this task has become increasingly difficult.

The personnel cutbacks and retention problems have meant that the Department has relied increasingly on service contracts to obtain many of the skill sets lost. However, in DGLEPM, the contracting for EMT augmentation continues to burden the NP funding and until more fulltime employees (FTEs either military or civilian) can be hired and trained, the problem will continue. Another concern with short-term contracting for professional services is the risk of developing an "employee/employer" relationship.

Several Enterprise Resource Planning tools are being fielded concurrently in the Material Group. Although a lot of the problems being experienced can be contributed to growing pains, all the projects are not yet complete and their ability to all function as expected will not be proven for some time yet.

In an attempt to better analyze the equipment management system in place in ADM(Mat), this paper briefly examined how the United Kingdom and the United States support their militaries. First, in the United Kingdom, the Ministry of Defence's approach to equipment acquisition and sustainment is quite practical, with the emphasis on encouraging innovation through commercial and in-house solutions depending on whichever is better placed to deliver required services at best value. They (the MOD) have found that there isn't any need for a predisposition towards either public or private

sector; the main driver is the better use of resources in defence and the maintenance or enhancement of operational effectiveness.

In the U.S., the Army Material Command strives to “continuously improve support to soldiers by implementing knowledge management enterprise solutions, instituting pilot programs and improvement initiatives to positively influence material readiness and establishing the “Lean Thinking” philosophy of management across AMC.”<sup>85</sup>

After having examined the equipment fleet management system in place in the Material Group and comparing it to how the United Kingdom and the United States provide similar services, recommendations were made in the following areas:

- a) Hiring and Retention;
- b) Consecutive vs Concurrent ERPs;
- c) Short Term vs Long Term Contracting;
- d) Partnering with Industry;
- e) The Budget;
- f) Procurement Cycle Time; and
- g) The Need for Future Study.

The Department of National Defence is organized and run in a business-like fashion and like any other business, in order for the Material Group, which is a Level 1 unit of the Department, to properly serve its customers, it must be extremely efficient, not only in how it manages its products, but in the management and utilization of its

employees as well. With a limited budget and constraints imposed by the Public Service, ADM(Mat) has been faced with making difficult decisions with regards to spending priorities and staffing procedures (hiring vs contracting). With strong leadership and capable staffs at all levels, ADM(Mat) and his Material Group provide the equipment fleet management that enables the Canadian Forces to successfully fulfill its mandate.

This paper began with the thesis that from a resource allocation perspective, the Department of National Defence (specifically the Material Group) could more efficiently manage the Canadian Land Forces' equipment fleets through the entire life cycle of the equipment. Although ADM(Mat) and his Material Group provide a valuable service to the Canadian Forces, with today's diminished budgets and a highly competitive workforce, efficiencies can possibly be realized in the allocation of resources that will enable the Material Group to maintain the high quality of service provided while still respecting budget constraints.

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## Appendix A

### TABLE OF ACRONYMS

ADM – Assistant Deputy Minister

ADM Fin (CS) – Assistant Deputy Minister Finance (Corporate Services)

ADM HR Civ – Assistant Deputy Minister Human Resources Civilians

ADM HR Mil – Assistant Deputy Minister Human Resources Military

ADM IE – Assistant Deputy Minister Infrastructure and Environment

ADM IM – Assistant Deputy Minister Information Management

ADM(Mat) – Assistant Deputy Minister (Material)

ADM(Pol) – Assistant Deputy Minister (Policy)

ADM S&T – Assistant Deputy Minister Science and Technology

AMC - Army Material Command

ASD – Alternative Service Delivery

CAS - Chief of the Air Staff

CDA – Canadian Defence Association

CDS – Chief of the Defence Staff

CF - Canadian Forces

CFQ - Competing For Quality

CFSSU - Canadian Forces Supply System Upgrade

CLS - Chief of the Land Staff

CMS - Chief of the Maritime Staff

CRS - Chief of Review Services

DCDS - Deputy Chief of the Defence Staff

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DG – Director General

DGAEPM – Director General Air Equipment Program Management

DGEPS – Director General Equipment Program Support

DGIIP – Director General International and Industry Programs

DGLEPM – Director General Land Equipment Program Management

DGLFR - Director General Land Force Readiness

DGMEPM – Director General Maritime Equipment Program Management

DGSC - Director General Strategic Change

DGSP – Director General Strategic Planning

DLERM – Director Land Equipment Resource Management

DLR - Director of Land Requirements

DM – Deputy Minister

DMASP – Director Material Acquisition and Support Programme

DMMD – Director Military Manpower Distribution

DMS – Defence Management System

DND - Department of National Defence

DPG - Defence Planning Guide

DSP - Defence Services Program

ECS - Environmental Chief of Staff

EMT - Equipment Management Team

ERP - Enterprise Resource Planning

FMAP - Financial and Managerial Accounting Project

FTE - Full Time Employees

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GP - Group Principals

HR - Human Resources

HRIS - Human Resources Information System

IIE - Integrated Information Environment

IM/IT – Information Management/Information Technology

LF - Land Forces

LTCP – Long Term Capital Plan

LTCP(C) – Long Term Capital Plan (Construction)

LTCP(E) – Long Term Capital Plan (Equipment)

LTCP(IM) - Long Term Capital Plan (Information Management)

MA&S - Materiel Acquisition and Support

MASIS - Material Acquisition and Support Information System

MCCRT - Management Command and Control Reengineering Team

MND - Minister of National Defence

MOD - Ministry of Defence

NP - National Procurement

O&M - Operations and Maintenance

OEM - Original Equipment Manufacturer

OWSS - Optimum Weapon System Support

PFI - Private Finance Initiative

PMO – Project Management Office

PPP - Public Private Partnership

PRAS – Planning, Reporting and Accountability Structure

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PWGSC - Public Works and Government Services Canada

SME - Subject Matter Expert

SOW - Statement Of Work

SWE - Salary Wage Envelope

TB – Treasury Board

TBS – Treasury Board Secretariat

UK - United Kingdom

US - United States

VCDS - Vice Chief of Defence Staff