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A Plan to Reconstitute and Bolster CAF Service Support

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LIST OF ABBREVIATIONS

ADM – Assistant Deputy Minister

ADM(Mat) – Assistant Deputy Minister (Materiel)

ADM(Pol) – Assistant Deputy Minister (Policy)

ADM(RS) – Assistance Deputy Minister (Review Services)

AERE – Aerospace Engineer

BMOQ – Basic Military Officer Qualification

CA – Canadian Army

CADSI – Canadian Association of Defence and Security Industries

CAF – Canadian Armed Forces

CBP – Capability-Based Planning

CBPMO - Competency-Based Project Management Office

CDS – Chief of Defence Staff

CELE – Communication and Electronics Engineer

CGAI – Canadian Global Affairs Institute

COTS – Commercial-Off-the-Shelf

CS – Combat Support

CSS – Combat Service Support

CTS – Chief Technical Services

DDP – Department of Defence Production

DEF – Definition

DEO – Direct Entry Officer

Dept M&S – Department of Munitions and Supply

DG – Director General

DGAEPM – Director General Aerospace Equipment Program Management

DGLEPM – Director General Land Equipment Program Management

DGMEPM – Director General Maritime Equipment Program Management

DGMPRA – Director General Military Personnel Research and Analysis

DLFD – Director Land Force Development

DLR – Director Land Requirements

DND – Department of National Defence

DP – Developmental Period

DPS – Defence Procurement Strategy

DSS – Department of Supply and Services

EME – Electrical Mechanical Engineer

GSO – General Service Officer

HLMR – High-Level Mandatory Requirements

ID – Identification

IMP - Implementation

IRPDA - Independent Review Panel for Defence Acquisition

JISR – Joint Intelligence Surveillance Reconnaissance

LEMS – Land Equipment Management System

LOG – Logistics

MRG – Management Review Group

MS ENG – Marine Systems Engineer

NAV ENG – Naval Engineer

NCS ENG – Naval Combat Systems Engineer

OA – Options Analysis

OFP – Operationally Functional Point

PAD – Project Approval Directive

PAM – Procurement Administration Manual

RCAF – Royal Canadian Air Force

RCEME – Royal Canadian Electrical Mechanical Engineer

RCN – Royal Canadian Navy

RMCC – Royal Military College of Canada

ROTP – Regular Officer Training Plan

SEM – Systems Engineer Manager

SIGS – Signals

SOW – Statement of Work

SSE – Strong, Secure, Engaged: Canada's Defence Policy

TB – Treasury Board

VCDS – Vice Chief of Defence Staff

ABSTRACT

The Canadian Armed Forces (CAF) are facing a crisis. Recruitment is in decline while retention is becoming more and more difficult. With a reported shortage of over 10,000 members, the Chief of Defence Staff and Deputy Minister of National Defence co-released a Reconstitution Plan, within which Level 1 Commanders and Directors were tasked to identify opportunities for the CAF to devolve itself of certain responsibilities to civilians or contractors. This paper seeks to contribute to that objective.

With upwards of 1600 military positions, the focus of this analysis was on the Assistant Deputy Minister (Materiel) (ADM(Mat)) organization. A detailed breakdown of the CAF engineer and logistics positions in ADM(Mat) revealed the potential recovery of up to 806 positions. After backfilling shortages of these occupations elsewhere, there remained an additional 377 to redistribute to the CAF. A comprehensive assessment of the training development of a Royal Canadian Electrical and Mechanical Engineer (RCEME) officer illustrated the 114 weeks of development from Officer Cadet (OCdt) to Lieutenant-Colonel (LCol). A review of the evolution of procurement in Canada revealed ever-increasing civilian oversight, with influence through to the force development (FD) process, which emphasized the importance of professional military judgement in the FD requirements definition processes. The necessity of military experience for a Project Manager, however, was not evident. And, in fact, several challenges were presented, including a lack of procurement training for military procurement staff, as well as the negative impact of the posting cycle on project continuity.

The civilianization of ADM(Mat) provides the opportunity to draw from a much greater pool of candidates and the flexibility of employing new hires at all levels of the institution, a luxury not afforded in the CAF recruiting system. The solution is clear.

CHAPTER 1 – INTRODUCTION

The Canadian Armed Forces (CAF) are facing a crisis. CAF recruitment is in decline while retention is becoming increasingly difficult. The COVID-19 pandemic has exacerbated the issue, with restrictions on training making it harder to satisfy the strategic intake plan and support the posting of trained members to operational units.[1] As of 2023, the CAF is reporting a gap of over 10,000 service members, which creates a risk to national security and support to Canada's international commitments.[2] Recognizing this crisis, the Chief of Defence Staff (CDS) and Deputy Minister (DM) of the Department of National Defence (DND) released the CAF Reconstitution plan in July 2022. This holistic policy directed all Level 1 headquarters to "[a]ssess what tasks/capabilities must be retained by Defence and can be transferred from CAF to DND employee or contractor responsibility."[3] This initiative is not without precedent as it was previously applied to the Canadian Forces Personnel Support Agency in 1996. Through the civilianization of the support services program, the CAF was able to save approximately $6 million per year through the transfer of 500 positions from military to civilian staff.[4] The purpose of this paper is to assist in that effort in a modern context.

In order to determine the optimal candidate for a position, it is essential to understand the expected responsibilities and acceptable delegated authorities and decision-making. These questions were asked following the amalgamation of the DND central staff with the Canadian Forces Headquarters (CFHQ) back in the 1970s. The 1985 Study Report on NDHQ outlines the questions posed at the time:

> What kinds of questions can be decided by civilian executives? What kinds of questions can best be decided by professional military leaders? And what kind of questions require combined judgements? How can civil authority establish and maintain appropriate control without jeopardizing military operations or inhibiting the expression of professional military judgement? What kinds of checks and balances are needed to prevent military superiors from bringing improper pressure to bear on military subordinates filling a two or three year posting under a civilian manager in NDHQ.[5]

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[1] Department of National Defence, *Department of National Defence Departmental Results Report 2021-2022 (Ottawa: DND, 2022).* 60. This will be referred to as the DND DRR 2021-2022.

[2] Lee Berthiaume, 'Canadian Military Facing a Recruitment Crisis | CTV News', accessed 11 April 2023, https://www.ctvnews.ca/canada/military-sounds-alarm-over-recruiting-problems-as-canadians-steer-clear-1.6083496.

[3] Canada. Department of National Defence, *CDS/DM Directive for CAF Reconstitution* (Ottawa: DND, 2022), https://www.canada.ca/en/department-national-defence/corporate/policies-standards/dm-cds-directives/cds-dm-directive-caf-reconstitution.html. 24. This will be referred to as the CAF Reconstitution Directive.

[4] M. Douglas Young, *Compendium of Changes in the Canadian Forces and the Department of National Defence* (Ottawa: DND, 1997), 3.

[5] D. G. Loomis, 'The Canadian Forces and the Department in War and Peace: A Supporting Paper to the NDHQ Study S3/85 Report' (Ottawa: DND, 1985), 114–15.

All of these questions force reflection on the attribution of each position to either a military or civilian member; however, the answers are unfortunately quite subjective, thus requiring additional support tools. Taking a broader approach, the critical differences between the roles and responsibilities of a generic military member and a civilian employee within DND can be analyzed. Fundamentally, military members must be capable of operating in their respective service environments (i.e. Royal Canadian Navy (RCN), Royal Canadian Air Force (RCAF), and Canadian Army (CA)) and may be compelled to do so at any time, both within Canada and on expeditionary operations. Although essential to the proper conduct and efficiency of the CAF, civilian members on the other hand are not beholden to these same demands. Applying this to the service environments, all positions that may require a deployment to an operational ship, a remote airfield or maintenance facility overseas, or participation in a field training event or operation may not be transferred to civilians. Beyond the limitation of service in the specific environments listed, the DND Organization and Establishment (O&E) Policy provides the following ten factors to consider when determining whether a position should be filled by a military member vice a civilian public servant:

> a. the position is required by law and regulations;
>
> b. the organization determines that current military Knowledge, Skills, Abilities and other competencies are required which are only acquired through military professional development and/or military training;
>
> c. the position provides essential trainings and development for a military member (e.g. Log officer gaining experience for next operational deployment);
>
> d. the position is required for essential rotational purposes (e.g. Ship-to-shore ratio);
>
> e. the position is required to augment the operational force [e.g. Base Security Force (BSF)];
>
> f. the position is required to support effective Military career structures (e.g. maintaining a viable number of positions in an MOC to retain that MOC's health.); and,
>
> g. credibility of the position must be considered. Maintaining the credibility of the CF to the Canadian Government, public and international allies must remain paramount.[6]

Although the list above may appear intuitive, there are a few nuances that lead to biased subjectivity. Although point a is clear, point b on the other hand does not in and of

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[6] Department of National Defence. C Prog/DDFP 7, 'Interim Organization and Establishment Policy (CFP 219)' (Department of National Defence, June 2012), http://vcds.mil.ca/intro_e.asp. 86

itself justify the need for a position to be held by a *currently* serving military member, as a recently retired member would have the exact same experience and qualifications as another who decided to remain in the forces. Point c assumes that the experience gained from being employed in a position is required for a subsequent position; however, this ignores the possibility that the subsequent position in and of itself is not essentially military. For instance, if the senior position in question is a Systems Engineer Manager (SEM). A pre-requisite to this employment would be to have experience as a junior, specialist or test engineer. Through a military lens, a member would have to be employed in both positions successively in their career. If it is determined that they should not be employed as a SEM, then they would no longer be required to fulfill the responsibilities as a Test Engineer or similar position. Point d ignores the operational nexus of lower-level positions versus senior ranks. The ship-to-shore ratio often gets confused with an operational versus rest and rehabilitation cycle. A better reference to use would be a deployed to domestic employment ratio. Tracking time spent away form home by position would be a better indicator of burn-out of staff, which this point is trying to protect. Point e assumes that all fighting forces are deployed, which would thus require a reserve infrastructure defence plan. Rather than operationalizing non-operational positions, the CAF could instead define base or infrastructure defence as a primary responsibility of the fighting forces, thereby allowing them to properly apportion and train their forces for their explicit tasks. Point f requires detailed analysis in career management of each occupation and the type of employment members may have at each rank. In order to ensure the proper health of an occupation, it is generally assumed that a 3:1 ratio is required at each rank; thus, an appropriate quantity of positions needs to be maintained. This becomes more nuanced, however, as the ranks progress, since officers in particular become more generalized, thus no longer necessitating the particular experience of their respective occupation. Point g is naturally subjective, but would only apply to outwardly exposed occupations such as a public affairs officer or senior leaders who are expected to represent the defence and security establishment with the associated experience (e.g. a CDS, base commanders etc...) Overall, theses factors provide some guidance for consideration; however, they are not directive. The ambiguity within each element of this list provides sufficient flexibility for managers to apply their own biases in determining who they *want* vice who the organization *needs*. This presents the opportunity for a more objective evaluation of the merits of civilians or military members in each position.

In consideration of the O&E factors, a more thorough analysis would only be warranted towards administrative or institutional positions, most commonly found at the National Defence Headquarters (NDHQ) in the National Capital Region (NCR). DND has over 128,500 positions, with an authorized strength of 71,500 Regular Force and 30,000 Reserve Force members, alongside over 27,000 civilians.[7] The focus area can be further refined by analysing CAF positions that do not fall under the CAF chain of

[7] 'DND/CAF Footprint - Canada.Ca', accessed 31 January 2023, https://www.canada.ca/en/department-national-defence/corporate/reports-publications/transition-materials/defence-101/2020/03/defence-101/dnd-caf-footprint.html; Canada. Department of National Defence, *Strong Secure Engaged: Canada's Defence Policy* (Ottawa, ON, CA: DND, 2017).

command, i.e. positions within Assistant Deputy Minister (ADM)-led departments. As the largest department within DND, ADM(Materiel) (ADM(Mat)) manages over 6700 positions, with over 1600 allocated to active military.[8] Thus, an ADM(Mat) organizational review presents a great opportunity to reallocate military members back to the CAF.[9] This paper seeks to provide a recommendation on the reallocation of positions from ADM(Mat) to the CAF and the associated civilianization of vacated positions in ADM(Mat).

The concept of civilianization of military organizations is not new. Colonel (retired) Ross Fetterly argued for the creation of a separate procurement organization, whether it be a Special Operating Agency or Crown Corporation.[10] The Crown Corporation would be akin to Defence Construction Canada or Canadian Commercial Corporation, both of which also provide services to the Government of Canada through engineering and construction project services or capital procurement from/to other nations respectively. Either option would see the acquisition arm completely civilianized, with the DND retaining responsibilities for capability and requirements definition – via the CAF - and for weapon system in-service management – via ADM(Mat).[11] Various other studies have posited arguments for this civilianization, including the comparative longer tenures of civilians versus military members.[12] From a North Atlantic Treaty Organization (NATO) study on civilian and military integration: "In select instances, it may also be beneficial to "civilianize" some key positions where continuity and longer tenure is particularly important."[13] In a proper functioning liberal democracy, civilian oversight of military affairs is in fact essential. The National Defence Act stipulates "The Minister [of National Defence, a civilian] . . . is responsible for . . . research relating to the defence of Canada and to the development of and improvements in materiel."[14] Further, pursuant to the Defence Production Act, the Minister of Public Service and Procurement Canada (PSPC), another civilian, has "exclusive authority to buy or otherwise acquire defence supplies and construct defence projects required by the Department of National Defence".[15] All elements of the process, from the determination

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[8] Department of National Defence, 'MCS Personnel Dashboard', n.d., accessed 7 May 2023.

[9] ADM(Information Management) employees the greatest number of CAF members outside of the CAF chain of command; however, the author's experience working with ADM(Mat) provided more insight into the existing structure and processes of the organization.

[10] Ross Fetterly and Royal Military College of Canada. Graduate Studies and Research Division, 'Arming Canada: Defence Procurement for the 21st Century' (Doctoral Thesis, Royal Military College of Canada, 2011), 399–411. The Special Operating Agency would be akin to the Canadian Forces Housing Agency and Defence and Research Development Canada, providing services directly to DND.

[11] Fetterly and Royal Military College of Canada. Graduate Studies and Research Division, 'Arming Canada: Defence Procurement for the 21st Century'.

[12] Roland J. Gagnon, 'An Examination of the Assumptions Behind Attempts to "Civilianize" DOD Acquisition Process' (Wright-Patterson Air Force Base, Ohio, Air Force Institute of Technology, 1991), https://apps-dtic-mil.cfc.idm.oclc.org/sti/pdfs/ADA246862.pdf. 81

[13] Irina Goldenberg and Angela Febbraro, 'Civilian and Military Personnel Integration and Collaboration in Defence Organisations', *SCIENCE AND TECHNOLOGY*, n.d., 460.

[14] 'National Defence Act' (R.S.C., 1985), https://laws-lois.justice.gc.ca/PDF/N-5.pdf. 10

[15] Canada, 'Defence Production Act', Canada.ca, accessed 27 September 2022, https://laws-lois.justice.gc.ca/eng/acts/D-1/index.html.

of what needs to be purchased through to the exercise of actually purchasing the equipment, are managed and overseen by civilian personnel.

In order to have the greatest impact on effective CAF reconstitution, this paper will first analyze the specific gaps in the CAF recruiting and retention numbers in Chapter 2, with particular attention towards occupations and positions within ADM(Mat). With these positions identified, the focus will shift in Chapter 3 to the development of a military officer, and more specifically, a Royal Canadian Electrical and Mechanical Engineering (RCEME) officer. Subsequently, Chapter 4 will explore the DND procurement system, and more specifically ADM(Mat)'s responsibilities within it, including a history of the evolution of procurement in Canada, the force development process, and finally the project approval process. Chapter 5 will review the employment of military members in ADM(Mat) followed by an analysis of civilian employment in Chapter 6. Lastly, concluding remarks and recommendations will then be provided in Chapter 7.

Due to the length limitations of this paper, the scope had to be limited. Although there are over 100 careers available in the CAF, this paper will focus on the most prevalent trades within ADM(Mat) and primarily in the officer corps due to the administrative nature of their employment. Further, the scope will be restricted to a comparison of a public civil servant and a regular force member, despite nuances such as civilians with prior military experience, civilian contractors, as well as reserve force members.

CHAPTER 2 – PERSONNEL SHORTAGE

Introduction

The CAF is experiencing a mass exodus of trained members simultaneous to a more challenging recruiting environment. This deficiency is materializing at a time when the world's peace and security is deteriorating and the international rules-based order is under threat from authoritarian regimes.[16] With the Russian invasion of Ukraine, the break-down of nuclear negotiations with both North Korea and Iran, and the posturing of the Chinese regime against Taiwan, the relative peace on Earth over the past eighty years is at risk.[17] Further, climate change is having devastating effects on the safety and security of Canadians.[18] These are all factors in which the CAF is historically relied upon to provide protection, security and relief. With all these critical issues arising, the demands on the CAF are increasing, as liberal democratic states across the world build up their militaries and defenses in preparation for the unknown. Canada also needs to be ready. The Canadian military needs to be healthy, well equipped, well trained, and ready to work and fight. Unfortunately, according to the 2021-2022 Department Results Report, only 71% of forces were deemed to be "ready for operations."[19] Recognizing the tremendous risk this imparts on the Canadian government and Canada writ large, the CDS issued both a retention strategy and a reconstitution order in quick succession.[20] Through these initiatives, the CDS made his priorities clear: facilitate post-COVID-19 pandemic CAF recovery to a steady-state and then build back up the CAF.[21]

The shortage of personnel is a pan-CAF problem, with no environment unscathed. There are various reasons for the recruiting and retention challenges experienced by each environment, the study of which is out of scope for this paper. Rather, this paper investigates positions specifically within ADM(Mat) as potential contributors to support a comprehensive solution to the military personnel shortage.[22] Thus, this chapter will identify the quantity and types of military positions within ADM(Mat) that may be suitable to reallocate to civilians so that military personnel employment can be optimized in roles that best exploit their experience, skillset, and capabilities.

ADM(Mat) quantity of positions by trade

As of January 2023, there were over 1600 positions for military members at ADM(Mat) spanning across more than sixty occupations.[23] Of these positions, over 900

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[16] Department of National Defence, *Department of National Defence and Canadian Armed Forces 2023-2024 Departmental Plan* (Ottawa: DND, 2023), 3, https://www.canada.ca/en/department-national-defence/corporate/reports-publications/departmental-plans/departmental-plan-2023-24.html.

[17] Department of National Defence, 3.

[18] Department of National Defence, 18.

[19] DND DRR, 57.

[20] CAF Reconstitution Directive. 90

[21] CAF Reconstitution Directive. 13

[22] ADM(Mat) was selected in particular due to the author's experience working with the organization, while also noting that the principal responsibilities of the positions within it are administrative in nature.

[23] Department of National Defence, MCS Establishment, accessed 18 Jan 2023.

are reserved for regular force officers. Table 2.1 below outlines the top seven military officer trades employed by ADM(Mat).[24]

Table 2.1 – Officer Positions at ADM(Mat)

Occupation/Trade	Trade Type	Lt(N)-SLt/ Capt-Lt	LCdr/ Maj	Cdr/ LCol	Capt(N)/ Col+	Quantity
Aerospace Engineer (AERE)	Engineer	180	87	23	5	295
Royal Canadian Electrical Mechanical Engineer (RCEME)	Engineer	48	56	19	5	126
Naval Combat Systems Engineer (NCS ENG)	Engineer	61	38	N/A	N/A	99
Marine Systems Engineer (MS ENG)	Engineer	41	47	N/A	N/A	88
Logistics (LOG)	Support	40	25	13	2	80
Signals Officer (SIGS)	Engineer	30	16	3	1	50
Communications Electronics Engineer (CELE)	Engineer	21	12	3	1	37
Naval **Engineer (NAV ENG)**[1]	Engineer	N/A	N/A	24	7	31
						806

Note 1 - NAV ENG amalgamates both MS ENG and NCS ENG at the Cdr rank.

Source: MCS Establishment, accessed 18 January 2023

Of particular note, six of the seven occupations are engineers, with the seventh being logistics. In view of the nature of the organization and the emphasis on material acquisition, this is not a complete surprise; however, the relatively low ratio of

[24] Naval Engineers encompass both Marine Systems and Naval Combat Systems Engineers at the rank of Commander and above; thus, although there are eight trades listed, they stem from only seven occupations.

logisticians to engineers may be, given that material management is half of the department's responsibilities. Another important observation is the range of ranks that are employed in ADM(Mat) for each occupation. CAF members from Lieutenant (Lt) to Colonel (Col) have employment opportunities in ADM(Mat) and there is an expectation that members move in and out of these positions within the organization as they progress in rank. The understanding is that, as the military members progress in rank, they are trained in a progressive manner, leveraging their experience of the overall CAF system, which can then be brought back into ADM(Mat). For example, it is assumed that a baseline RCEME Major (Maj) will have gained the requisite experience as a Captain (Capt) to fulfill their responsibilities at that rank prior to their posting into a position in ADM(Mat), a concept that will be explored further in Chapter 3. With this diversity of experience, echeloned training, and associated qualifications, military members would be more aware of how decisions made within ADM(Mat) affect the operational force and can exert a greater influence in the process with a positive impact to the institution. This concept will be explored within Chapter 5. A final observation on Table 2.1 is that there are 806 positions specifically allocated for engineers and logistics officers within ADM(Mat). With a shortage of approximately 10,000 personnel in the CAF, these administrative positions equate to approximately 8% of the total staffing delta. Although the functions performed by the personnel employed in these positions are critical, the determination of whether or not these can be satisfied by civil servants will be analysed in Chapter 6.

CAF position shortages in ADM(Mat)-related trades

From the November 2022 Establishment Status Report from Director General Military Personnel Research and Analysis (DGMPRA), Table 2.2 below displays the shortage associated with the principal occupations employed at ADM(Mat).

Table 2.2 – Shortage of Personnel by Occupation and Rank

TRADE	TRADE TYPE	SHORTAGE[25]				
		Lt(N)-SLt/ Capt-Lt	LCdr/Maj	Cdr/LCol	Col+	Total Quantity
AERE	Engineer	62	24	11	-2[1]	95
SIGS	Engineer	35	40	5	-1[1]	79
LOG	Supporter	-3[1]	73	5	0	75
MS ENG	Engineer	38	19	N/A	N/A	57
CELE	Engineer	30	15	0	-2[1]	43
NCS/MS ENG	Engineer	22	19	N/A	N/A	41
RCEME	Engineer	12	24	1	0	37
NAV ENG	Engineer	N/A	N/A	-1[1]	3	2
						429

Note 1 - negative quantity implies an overage of personnel at the rank and trade.

Source: DGMPRA Establishment Status Report, November 2022

A comparison of ADM(Mat) positions to the CAF shortages by rank and occupation illustrates the potential for the direct recovery of an additional 377 positions if all engineer and logistician positions were to be reallocated from ADM(Mat) to the CAF.[26] This calculation is overly simplistic though as occupations are not necessarily

[25] Shortage is determined by subtracting the Trained Effective Strength (TES) from the Trained Effective Establishment (TEE) of each occupation by rank. TES comprises "[a]ll military members who have attained the OFP and who are available to fill TEE positions. This includes those posted to non-accountable positions (e.g. on operations overseas), posted with a status of Military Manning Overhead (MMO), and on [leave without pay] LWOP." TEE comprises "[a]ll accountable military positions within the system of record that are designated to be filled by military members who have attained the OFP in their occupation. This includes all functional (manning) positions, the [advanced training list] ATL, secondments, Project Management Position Resource (PMPR), and equivalent accountable positions in the system of record for the classified establishments. The TEE is similar to the Preferred Manning Level (PML); however, the PML accounts for establishment changes that are planned for the future. DGMPRA Canada, 'Establishment and Strength Report - Summary - October 2022' (Ottawa: Canada, October 2022).

[26] Recovery of total positions equates to the difference between the total in Table 2.1 (806) and the total in Table 2.2 (429) for a difference of 377. The detailed breakdown of the deltas (overages) by rank and occupation can be found in Annex A.

interchangeable in employability within the CAF (e.g. an Aerospace Engineer does not have the qualifications or experience to run a Naval Engineer department.) Although there is a cumulative overage in each one of the occupation/rank tables, deltas persist in the SIGS, CELE, and LOG occupations. Therefore, the recovery of ADM(Mat) positions does not in and of itself resolve all officer position deltas within the CAF. Nonetheless, there are still significant potential gains to be had, and the overages identified could be leveraged to fill general service officer (GSO) positions across the CAF, with the potential to backfill other trade deltas.[27] The recovery of positions from ADM(Mat) to the CAF will evidently contribute to the reconstitution efforts; however, this solution presents other challenges, namely the availability of civilian staff to fill the new ADM(Mat) vacancies.

As Canadian Global Affairs Institute (CGAI) fellow and Queen's Professor Jeffrey Collins outlined, ADM(Mat) has historically had difficulty hiring civilians.[28] Procurement staff has fluctuated between 2,500 in the mid-1980s to 600 personnel in 2006. Despite additional funding and major procurement commitments in the 2007 Canada First Defence Strategy, Prime Minister Harper's Deficit Reduction Action Plan subsequently reduced ADM(Mat) staffing by 400.[29] The situation in 2023 is no better. Although ADM(Mat) was allocated more staff positions as part of Strong, Secure, Engaged, Canada's Defence Policy (SSE),[30] they are still operating at a 30% deficiency, which has been attributed to competition with industry for specialty-skilled staff.[31] Pulling away military resources from filling these ADM(Mat) roles will surely exasperate the issue. Although this is a great challenge, this is above the CAF mandate, and should thus be investigated and managed through ADM(Mat) to the Defence Minister and up to Treasury Board as required. If the CAF continues to occupy these positions, the government and ADM(Mat) will not maintain operational resolve to address the shortage and would likely never attain the goal of a self-sufficient Material and Acquisition force structure.

Conclusion

Society as a whole is short workers and there does not appear to be any silver-bullet solution to this problem.[32] Solutions must be examined through analysing the

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[27] GSO positions are identified as open to all officer trades and managed through the Baseline Manning Control (BLMC) process. These positions provide flexibility to the personnel management system to allow for with the expectation that the baseline officer development program prepares any officer with the skillset necessary to perform the functions of the particular position.

[28] Jeffrey Collins, *Defence Procurement Canada: Opportunities and Constraints* (Calgary: Canadian Global Affairs Institute, 2019). 3

[29] Collins.

[30] Department of National Defence, *Strong Secure Engaged*, 75.

[31] Department of National Defence., 'Evaluation of Acquisition Project Management (Agile Acquisition, Innovation and GPA Plus)' (ADM(RS), December 2022), https://www.canada.ca/content/dam/dnd-mdn/documents/reports/2022/reports-pubs-audit-eval/report-1258-03-057-en.pdf. 10

[32] Statistics Canada, 'Labour Shortage Trends in Canada', 2022, https://www.statcan.gc.ca/en/subjects-start/labour_/labour-shortage-trends-canada.

recruiting and retention challenges in each organization and then attacking them methodically. From a military perspective, however, the challenge is here and now, and solutions need to be applied immediately to address the operational staffing shortfalls. Continued attrition of the forces and a challenging recruiting environment were identified in the most recent Departmental Plan as key risks to the CAF's Ready Force core responsibility.[33] Personnel shortages are a challenge everywhere. However, as the next chapter will illustrate, CAF officer development is an extremely lengthy process, one in which large jumps in steps are made impossible by a very deliberate and controlled promotion and advancement framework designed to ensure that members are prepared for the challenges of their next position. Failure is not an option for the CAF; the risks can literally be a matter of life and death. Priority must reside with filling the ranks of the CAF first and foremost. Reorienting key staff from procurement directly back into the CAF operational and institutional support streams may provide just enough support to maintain the current force while satisfying the CDS' reconstitution objectives.

[33] Department of National Defence, 'DND Dept Plan 2023-2024', 29.

CHAPTER 3 – MILITARY PERSONNEL

Introduction

Chapter 2 highlighted engineering and logistics positions as being the most prominent in ADM(Mat). This chapter will examine the construct of military occupations from recruiting to initial training, followed by a review of the diverse career paths for members of the RCEME Corps.[34] The objective is to illustrate the amount of training invested in CAF members that is intended to prepare them to perform military functions. Then the remainder of this chapter will highlight the structure of employment and promotions of RCEME officers across DND. With an understanding of the state of the RCEME Officer Corps and how it is intertwined with ADM(Mat), this paper can then transition into a review of the evolution of procurement in Canada, followed by an analysis of the CAF force development and project approval processes. There are many elements of the CAF above the RCEME Officer Corps; therefore, a high and wide approach will be taken to go back and start chronologically to explain the process and timelines for a civilian to become a RCEME Col.

The Canadian Armed Forces are divided into two components: the Regular Force – or commonly referred to as full time members – and the Reserve Force – those "who are enrolled for other than continuous full-time military service when not on active service."[35] These two components are further sub-divided into two rank structures: Officers and Non-Commissioned Members (NCM). In general, Officers are in mid-to-senior leadership roles with the associated authorities, responsibility, and accountability (ARAs) to care for their subordinates and their morale, safety, and wellbeing. They are entrusted to critically analyse, plan, and decide or advise on critical tasks that may involve life or death.[36] The NCMs on the other hand are skills-based and task-oriented to be employed in operational or support roles at the lower rank levels, or employed in advisory roles in the most senior ranks.[37] The career paths differ greatly between the two structures. As this paper seeks to compare ADM(Mat) positions held by military officers versus civilians, this chapter will focus specifically on the officer career path.

Officer Program

Civilians may join the CAF under two distinct programs: the Regular Officer Training Program (ROTP), with subsidized education through the Royal Military College of Canada (RMCC) or a civilian university; or the Direct Entry Officer (DEO) Program, when they already hold a university degree.[38] Upon enrolment, members are assigned the

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[34] The RCEME Corps was selected specifically due to the author's experience in the land domain, working alongside RCEME officers both at the tactical and institutional levels.

[35] Department of National Defence. DDFP, 'Organization and Establishment Directive (Draft)', n.d., accessed 6 May 2023. 16

[36] Canada, 'Joining the Canadian Armed Forces | Canadian Armed Forces', Forces.ca, accessed 17 March 2023, https://forces.ca/en/how-to-join/.

[37] Ibid.

[38] Ibid.

rank of Officer/Naval Cadet (OCdt/NCdt), as they are training towards their Operationally Functional Point (OFP), which is the point at which they have completed their training for their baseline employment within their occupation.[39] The army officer development program consists of five professional developmental periods (DP), as outlined in Table 3.1 below.

Table 3.1 – Army Officer Developmental Periods

DP	Rank	Training Requirement
DP1	OCdt	Basic Military Officer Qualification, Basic Military Officer Qualification-Army
DP2	Lt/SLt-Capt/Lt(N)	Army Tactical Operations Course Army Operations Course
DP3	Maj	Joint Command and Staff Program
DP4	Col	National Security Program[1]
DP5	BGen	Senior Officer Qualification[2]
Note 1,2 – As officers no longer have environmental affiliations beyond the rank of LCol, DP4 and DP5 courses are not analysed further		

Source: DAOD 5031-8, Canadian Forces Professional Development, March 2023

The first period, DP1, consists of the Basic Military Officer Qualification (BMOQ), the applicable environmental qualifications, and the basic military occupation qualification courses.[40] For ROTP participants, these courses typically take place during the summers between university semesters, whereas DEOs will typically complete all training sequentially upon enrolment.

BMOQ is common to all military occupations and is the first course new OCdt/NCdts undertake. This ten-week course provides a gradual introduction to military life, including day-to-day routine, discipline, basic fieldcraft, and officer leadership.[41]

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[39] Canada, 'Ofp [5 Records] - TERMIUM Plus® — Search - TERMIUM Plus®', Termium Plus, accessed 6 May 2023, https://www.btb.termiumplus.gc.ca/tpv2alpha/alpha-eng.html?lang=eng&i=1&srchtxt=ofp&index=alt&codom2nd_wet=1.

[40] 'DAOD 5031-8, Canadian Forces Professional Development - Canada.Ca', accessed 19 March 2023, https://www.canada.ca/en/department-national-defence/corporate/policies-standards/defence-administrative-orders-directives/5000-series/5031/5031-8-canadian-forces-professional-development.html.

[41] Canada, 'Joining the Canadian Armed Forces | Canadian Armed Forces'.

Since beyond BMOQ, the developmental periods differ by occupation, only the RCEME career model will be used to provide a concrete example of the training and associated career progression of an officer to attain the rank of Col.[42]

RCEME

Taking a step back, the RCEME Corps differentiates itself from many other officer occupations by requiring new OCdts to have a bachelor of science, applied science or engineering degree.[43] As the owners of the Land Equipment Management System (LEMS), the RCEME Corps is responsible for the life-cycle management of equipment from the acquisition, through the implementation and training, and to the final disposal and replacement.[44] As such, demonstrated knowledge and familiarity with science and engineering concepts is deemed essential to understand the intricacies of land force equipment. As stated above, RCEME officers undergo BMOQ, as do all other officers. Following this common training, as participants of the land environment, all RCEME officers then embark on the 11-week Basic Military Officer Qualification-Army (BMOQ-A) course.[45] RCEME officers are then ready to commence their occupational training. Their DP1 EME Officer course is divided into two modules and consists of a total of approximately 25 weeks of training.[46] The first module focuses on the basic LEMS program and maintenance functions, whereas second module applies the concepts to the field environment, such as siting, establishing and moving a field maintenance workshop and combat service support organization.[47] Upon successful completion of this training, RCEME officers are then deemed to have achieved their Operationally Functional Point (OFP) and are ready for their initial employment. In summary, as shown in Table 3.2, from recruitment to initial employment, the CAF requires 46 weeks or essentially a full year to train a civilian to become a baseline RCEME officer, not

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[42] AERE, NAV ENG (MS ENG and NCS ENG), SIGS, and LOG all have their own distinct career paths and employment models; however, they all require a similar investment in training and variety of employment to progress in rank.

[43] Canada, 'ROTP | Paid Education | Canadian Armed Forces', Forces.ca, accessed 6 May 2023, https://forces.ca/en/paid-education/rotp; Department of National Defence. DGPR, 'A-PD-055-002/PP-002-The Canadian Armed Forces Military Employment Structures Manual, Volume 2 - Occupational Specifications, Part 1 - Officer Occupations, Occupation - Electrical and Mechanical Engineering (EME MOS ID 00187)', 28 2017. All military engineering occupations require a science, applied science, or engineering degree, while non-engineering occupations may have other educational requirements.

[44] Department of National Defence. DGPR, 'A-PD-055-002/PP-002-The Canadian Armed Forces Military Employment Structures Manual, Volume 2 - Occupational Specifications, Part 1 - Officer Occupations, Occupation - Electrical and Mechanical Engineering (EME MOS ID 00187)'. 11

[45] Department of National Defence., 'A-P1-002-D01/PG-B01-DP1 Basic Military Officer Qualification-Army', 9 March 2023, 01. 2-1/5

[46] Department of National Defence., 'A-P1-002-EME/PC-B01 Qualification Standard Electrical Mechanical Engineering (EME) Officer DP1 Electrical Mechanical Engineering Officer (DP 1 EME O)', 2 September 2016. 1-3/3. The EME Officer Course requires 124 training days.

[47] Department of National Defence.

including the baseline educational requirement of a four-year bachelor's degree in science or engineering.[48]

Table 3.2 – RCEME Officer Training Days

Course	Training weeks
Basic Military Officer Qualification (BMOQ)	10
Basic Military Officer Qualification-Army (BMOQ-A)	11
Developmental Period 1 - EME	25
Total	**46**

In their first few postings as second lieutenants (2Lt), lieutenants (Lt) or Capts, RCEME officers are typically employed in one of 23 RCEME-specific positions, from maintenance platoon commander to Training Staff Officer.[49] As junior RCEME officers, they are expected to manage a team of thirty or more maintainers, including vehicle, electro-optical, weapons, and material technicians. Being included in several Occupation Groups, they may also be employed in GSO positions, generic army officer positions, and Combat Service Support (CSS) positions, the latter of which is interchangeable with LOG officers.[50] The experience gained at this level permits RCEME officers to gain foundational knowledge of maintenance requirements and procedures at the tactical level in the CA.

As officers embark on DP2, professional development continues with the completion of several distance learning programs, to be undertaken simultaneous to their day-to-day positional responsibilities. All CAF officers must complete the CAF Junior Officer Development (CAFJOD) program courseware while CA officers must complete

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[48] It is important to note that the forty-six weeks of training comprises strictly of sequential work-weeks, assuming five workdays per week. This does not consider the days between the end of one course and the beginning of another, nor does it factor leave days. Further, DP1 EME modules one and two are only conducted once per year; therefore, if BMOQ-A is not complete prior to the beginning of DP 1 EME, the student would have to wait until the following year's serial. For ROTP students, all DP1 courses, less DP1 EME module two, run successively each summer between university school years. This generally permits RCEME students to embark on DP 1 EME module two in the fall, following completion of their science of engineering degree program. This ideal scenario would see RCEME officers attain OFP by the end of the year and would subsequently be posted to their first position as a RCEME officer.

[49] Department of National Defence. DGPR, 'A-PD-055-002/PP-002-The Canadian Armed Forces Military Employment Structures Manual, Volume 2 - Occupational Specifications, Part 1 - Officer Occupations, Occupation - Electrical and Mechanical Engineering (EME MOS ID 00187)'. Annex C.

[50] Department of National Defence., 'General Occupation Groups', 21 March 2023, https://collaboration-cmp-cpm.forces.mil.ca/sites/DPGR/Occupational_Specifications/Gen_Occ_Gps/Gen_Occ Gps_Bil.docx.

the Army Junior Staff Officer program.[51] In the CA, DP2 continues with the four-week Army Tactical Operations Course (ATOC), which is focused on Combat-Team level operations, followed by a 20-week Army Operations Course (AOC), where they learn to participate in Battle-Group and Brigade-level operations through simulation.[52] RCEME officers also have their own distinct four-week EME Advanced Officer Course (EAOC) focused principally on an introduction to Project Management. Upon completion of these three aforementioned courses, RCEME officers are ready for promotion to the rank of Maj.

Table 3.3 – Summary of the RCEME Officer Career Courses

Developmental Period	Course	Training weeks
DP1	Basic Military Officer Qualification (BMOQ)	10
DP1	Basic Military Officer Qualification-Army (BMOQ-A)	11
DP1	Developmental Period 1 - EME	25
DP2	Canadian Armed Forces Junior Officer Development (CAFJOD)	N/A[1]
DP2	Army Junior Staff Officer (AJSO)	N/A[2]
DP2	Army Tactical Operations Course (ATOC)	4
DP2	RCEME Advanced Officer Course (EAOC)	4
DP2	Army Operations Course (AOC)	20
DP3	Joint Command and Staff Program (JCSP)	40
	Total	114

[51] Department of National Defence., 'CANFORGEN 007/19 CMP 003/19 191956Z DEC 18', 19 December 2018; Canada. Department of National Defence. Canadian Army. A-P1-002-JLO/PH-B01, *Land Force Doctrine and Training System National Defence Training Plan Land Environment Qualification Army Junior Staff Officer (AJSO)* (Ottawa: DND, 2013).

[52] Canada. Department of National Defence, 'A-P1-002-ATO/PC-B01-Army Tactical Operations Course Occupational Specialty Specification', 16 September 2020. 1-3/3; Canada. Department of National Defence, 'A-P1-002-D20/PH-B01 National Defence Qualification Standard Training Plan Army Operations Course (AOC)', 18 June 2015. 3-3/6. A Combat Team consists of a grouping of Infantry and Armoured personnel and vehicles, along with combat support from Combat Engineers and Artillery and CSS provided by their integral administration platoons.

Note 1,2 – CAFJOD and AJSO are to be completed simultaneously to the officer's full-time employment, thus the requisite training time is not applicable in the total calculation of training time away from duties.

Note 3 – JCSP is offered in both a year-long residency and two-year distance learning versions, with the former consisting of 40 weeks of education, and the latter consisting of similar education, though it is to be completed simultaneous to their full-time employment (though they are typically granted one workday per week to complete their educational program)

RCEME Capts are assessed for promotion using the detailed scoring criteria in Table 3.4 below.

Table 3.4 – Selection Board Scoring Guide EME Officers – Captain

Criteria	Remarks	Max Score
Performance (Last 3 years)	Max 20 points per year	60
Second Language	Max points with BAB profile	4
Leadership Potential	Max 9 points without a command posting	13
Education	Includes points for a Masters Degree, the Technical Staff Officer Course, and professional certifications (PEng, PMP, PMCD Level 1)[53]	4
Military Professional Development	1 point each for RCEME AOC, AOC, and CAFJODs complete	3
Employment/Breadth of Experience	Max 4 points for a command position Max 2 points for any staff appointment 3 points for Land Equipment Program Management employment Max 1 point for an operational deployment Up to +4 points for key staff positions (+2 points for each position)	10

[53] PEng is a Professional Engineering designation; PMP is a Program Management Professional designation; and PMCD is the Program Management Competency Development program.

Promotion and Employment Recommendation		6
Total		**100**

Source: Selection Board Scoring Guide EME Officers - Captain

Of particular interest with this scoring guide is the recognition and encouragement of employment within the Land Equipment Project Management (LEPM) organization. The RCEME occupation has explicitly designed the promotion criteria with up to three points to encourage junior officers to seek a posting to a position in project management. In addition, it is at this stage that they are rewarded for additional professional education, such as up to two points for a Professional Engineer designation, Program Management Professional, or Program Management Competency Development (PMCD) Level 1. Due to the job experience criteria, these designations are not possible for those employed outside of the project management environment.[54] From a RCEME officer pool of approximately 221 junior officers, there are 47 positions within ADM(Mat), which translates to employment for approximately 21% of junior officers.[55]

At the Maj rank, there are 55 positions at ADM(Mat), distributed amongst ten RCEME-assigned LEPM job titles.[56] There are only six remaining *hard* RCEME position titles outside of LEPM: two Officers Commanding position titles (Maintenance Company and Training Company), two titles at the RCEME School (Deputy Commanding Officer and Chief instructor), and the Senior Ammunition Engineering Officer and the Career Manager.[57] As of 18 January 2023, there are 67 RCEME Maj positions within the CAF and three more within other ADMs assigned to be filled by the RCEME Corps, despite many of these not being specifically hard RCEME positions.[58] Therefore, ADM(Mat) holds approximately 44% of the RCEME Maj positions. Notwithstanding the high concentration of RCEME officers working outside of the CAF, officers still must comply with the CAF DP program in order to continue to progress in rank. Leading into DP3, in preparation for promotion to LCol, RCEME Majs are required to complete the Joint Command and Staff Program (JCSP), either through one-year full-time studies or over

[54] Department of National Defence, 'Selection Board Scoring Guide - EME Officers', August 2022.

[55] Department of National Defence., 'Military Command Software Establishment', 18 January 2023. Junior Officers include 2Lts, Lts, and Capts.

[56] Department of National Defence.; Department of National Defence. DGPR, 'A-PD-055-002/PP-002-The Canadian Armed Forces Military Employment Structures Manual, Volume 2 - Occupational Specifications, Part 1 - Officer Occupations, Occupation - Electrical and Mechanical Engineering (EME MOS ID 00187)'. Annex C.

[57] Department of National Defence. DGPR, 'A-PD-055-002/PP-002-The Canadian Armed Forces Military Employment Structures Manual, Volume 2 - Occupational Specifications, Part 1 - Officer Occupations, Occupation - Electrical and Mechanical Engineering (EME MOS ID 00187)'. Annex C. *Hard* positions are positions that are reserved specifically for members of that occupation as opposed to an occupational group.

[58] Department of National Defence. DGPR.

the course of two-years via distance learning (DL).[59] The RCEME Corps also manages a deliberate scoring guide for promotions to LCol, as outlined in Table 3.3 below.

Table 3.3 – Selection Board Scoring Guide EME Officers – Major

Criteria	Remarks	Max Score
Performance (Last 3 years)	Max 20 points per year	60
Second Language	Max points with BBB profile	5
Leadership Potential	Max 6 points without a command posting Max 2 points for ethos, EQ	12
Education/Military Professional Development	Max 4 points for a Masters Degrees Max 3 points for professional certifications (1 point each for PEng, PMP, PMCD Level 1, and/or 2 points for PMCD level 2) Max 2 points (2 points for JCSP, 1 point for Advanced Logistics Officer Course)	7
Employment/Breadth of Experience	4 points for a command position Max 1 point for any staff appointment 2 points for Land Equipment Program Management employment Max 1 point for an operational deployment Up to +4 points for key staff positions (+2 points for each position) Max 1 point for occupational advisor position	10
Promotion and Employment Recommendation		6
Total		**100**

Source: Selection Board Scoring Guide EME Officers - Major

[59] For the JCSP two-year DL option, officers are typically granted one day per week to complete their studies and assignments. They will also be required to attend in-person training for two weeks per year as part of their qualification. Overall, the CAF allocates approximately one hundred work days to complete the JCSP DL program. This is in comparison to the JCSP residency program which allocates approximately two hundred days.

Interestingly, there are fewer points attributed to positions within LEPM at the Maj rank level than at the Capt level. More impactful, however, is that other than executive assistant assignments, there is only one key staff position that is recognized at ADM(Mat) in which breadth of experience points can be gained: Director Land Equipment Program Staff (DLEPS) 3-2.[60] There is, however, an additional point available for completion of the PMCD level 2. This metric reinforces the RCEME Corps' desire for officers to diversify employment and to not become too entrenched and comfortable in the ADM(Mat) organization.

For those who successfully navigate through the RCEME promotion criteria and achieve the rank of LCol, there are eight job titles reserved for them. There are seven positions titles within the ADM(Mat) or ADM (Director Research and Development Canada (DRDC)) organizations and only one hard RCEME position in the CAF: the RCEME School Commanding Officer. Overall though, from a total of 36 positions for RCEME LCols, there are 16, or approximately 44% at ADM(Mat), two at ADM(DRDC), and 18 in the CAF. Fittingly, the ratio of RCEME officers remains consistent at 44% between the Maj and LCol ranks.

At the Col level, there are five additional job titles within the RCEME Occupational Specification, all non-operational positions.[61] In practice, there are five Cols employed at ADM(Mat), with three directors, a project manager and the commander of 202 Workshop.[62] There are five other RCEME Cols employed in the CAF, but only one of which occupies a hard RCEME position: Director of Force Development. The ADM(Mat) ratio thus increased from 44% to 50%.

In general, RCEME officers remain corps-aligned until the rank of Col. There are a multitude of opportunities for them to gain knowledge and experience and apply their skills in several elements of the organization. The three general fields of employment include staff, command, and LEPM.[63] As illustrated above, the RCEME Corps seeks to cross-pollinate their members between these three fields as much as possible and within all ranks, as this is deemed to be the best way to fully develop the RCEME officer comprehensive competency.[64] Annex C illustrates the breakdown of each RCEME position by rank and the associated expectation for operational or field employment. Of the 54 positions, only 21 have a requirement for direct field training or operations in a military training environment. This is broken down by rank as 14 job titles for Lt-Capt, six for Maj, and only one for a LCol. The remaining 33 positions take place solely in an office or workshop setting.

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[60] Department of National Defence, 'Selection Board Scoring Guide - EME Officers'.

[61] Department of National Defence. DGPR, 'A-PD-055-002/PP-002-The Canadian Armed Forces Military Employment Structures Manual, Volume 2 - Occupational Specifications, Part 1 - Officer Occupations, Occupation - Electrical and Mechanical Engineering (EME MOS ID 00187)'. Annex C

[62] 'Military Command Software Establishment'. 18 January 2023

[63] Department of National Defence, 'Selection Board Scoring Guide - EME Officers'.

[64] Department of National Defence.

The job titles are categorized by path, which highlights the main effort of the RCEME officer employment.[65] In particular, in the operational path, there are only seven job titles: five for Lt-Capt and two for Majs. The operational/institutional path (i.e. training) comprises another 13 job titles: nine for Lt-Capts, three for Majs, and one for LCol. The institutional path consists of jobs that are either managerial or advisory in nature or direct activities of non-operational personnel. This path comprises twelve jobs: four at the Lt-Capt level, four at the Maj level, two at the LCol level, and two at the Col level. The final RCEME-specific path is program management, with a total of 22 job titles: five at the Lt-Capt level, nine at the Maj level, five at the LCol level, and three at the Col level. These twenty-two job titles all report through the ADM(Mat) chain of command which holds the largest concentration (40%) of RCEME positions titles.

Of the 392 RCEME officers at TES, 108 are serving within ADM(Mat).[66] Over 25% of all RCEME officers perform program management functions. These functions increase in complexity as the rank requirement increases, but the principle responsibilities held by RCEME officers include Project Managers, Systems Engineers, Integrated Logistics Support Officers, and Equipment Management Team Leaders. These same positions (with slight nomenclature differences) are commonly held by military engineers across all three environments: AERE and CELE in the RCAF, MS ENG and NCS ENG in the RCN, and RCEME and SIGS Officers in the CA.

Conclusion

The RCEME officer career path provides a good representative model for the progression of a Regular Force officer. It begins with a civilian obtaining bachelor of science or engineering degree and embarking on their DP1 basic military training. After 46 weeks of training, they are ready to be employed as a RCEME officer. They are then likely to be employed in a field or operational environment, but will also be given a 20% chance of being employed in ADM(Mat) to gain valuable experience and associated points towards promotion. Hopefully, they take advantage of that time to complete additional professional education and acquire their PEng, PMP, and/or PMCD level 1. They will simultaneously progress through DP2, and after 28 weeks of formal training, in addition to two separate distance learning junior officer development programs, they will be ready for promotion to Maj. In this new rank, they will be provided ample opportunity to serve at ADM(Mat) to gain those experience points, despite the relative reduction in promotion-value of this experience to when they were a Capt. Having finally understood the inner workings of ADM(Mat), the mid-range Maj is now thrust back into the operational environment to apply all their lessons learned from their time working in projects or equipment life-cycle management. Having performed a multitude of key staff jobs and completed the year-long JCSP, the seasoned Maj is now promoted to LCol. They have the same opportunities in ADM(Mat) (44%) as when they were a Maj and will most likely find employment there. With excellent leadership skills and demonstrated

[65] These paths are not formally recognized but the author has divided them as such in order to illustrate the differences between the types of employment RCEME officers may have, each with a different expectation and reliance on their military experience or skill-set.

[66] Department of National Defence, ‘MCS Personnel Dashboard’.

potential, they are selected as the RCEME School Commanding Officer. Subsequently, they return to ADM(Mat) in a senior LCol position to anxiously await promotion to Col. When the time comes the compete for command of a formation, they are selected to command 202 Workshop. As their command term expires, they look to the last dedicated RCEME position and wait their turn. Finally, Director General Land Equipment Program Management (DGLEPM)! Now, as the senior leader of the RCEME Corps, influence can truly be achieved. . . or can it? In the next chapter, the CAF Force Development process and the DND procurement system will be explored to reveal the realms of possibility.

CHAPTER 4 – FROM FORCE DEVELOPMENT TO DND PROCUREMENT

Introduction

DND procurement has been under considerable scrutiny recently, with consistent debates in the House of Commons on large acquisition projects such as the Future Fighter project, the National Ship-building Program, and the replacement plan for army equipment donated to Ukraine.[67] The focus of these debates, however, has been on the lack of efficiency of the holistic procurement system vice the internal workings of DND itself. Many have argued for the need for an independently governed and unified DND procurement authority, with a view to centralizing decision-making.[68] There has been little external critical analysis, however, of the manner in which DND and the CAF in particular assign roles and responsibilities and enact authorities. There is a distinct element of civilian control over the military in general, and procurement specifically. Further, the military's ability to anticipate future capability requirements and adversary threats have been called into question. Both the procurement and force development systems have demonstrated weaknesses, contributing to the challenges in timely delivery of capabilities to the military in the face of new and emerging real-world threats. To that end, this chapter will provide a history of military procurement in Canada with a view to identify factors influencing the current system. This chapter will then explore the force development cycle from the beginning of the process to highlight stressors and deficiencies, followed by a general review of the project approval process.

History of Military Procurement in Canada

Although Canadian military procurement has a history of only one hundred or so years, surprisingly, as outlined in Dr. Martin Auger's seminal work *The Evolution of Defence Procurement: A Hundred-Year History*, there has been significant change. The first federal defence procurement policy derived from the First World War. Deficiencies were discovered with the CA and RCN having their own integral procurement organizations: The Department of Militia and Defence and the Department of Naval Services respectively.[69] Specifically, issues arose with regards to the price paid for common goods as well as the lack of coordination of production capacity.[70] Thus, the Borden government created the War Purchasing Commission in 1915, which enabled the government to "control and coordinate defence procurement and domestic war-related production more effectively and efficiently"[71] Simultaneously, Canadian war manufacturers' efforts were coordinated by a Shell Committee, run by Canadian

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[67] Hon John McKay, 'An Interim Report on the Defence of Canada in a Rapidly Changing Threat Environment', n.d.

[68] Alan S. Williams, *Reinventing Canadian Defence Procurement: A View from the Inside*, Book, Whole (Montreal: School of Policy Studies, Queen's University and McGill-Queen's University Press, 2006), 104.

[69] Martin Auger, 'The Evolution of Defence Procurement: A Hundred-Year History' (Library of Parliament, 14 December 2020). 1

[70] Auger. 1

[71] Collins, *Defence Procurement Canada. 4*; Auger, 'The Evolution of Defence Procurement: A Hundred-Year History'. 2

businessmen, and subsequently replaced by the Imperial Munitions Board, reporting directly to the British Ministry of Munitions in November 1915.[72] This board coordinated the supplies and resourcing of over 675 Canadian factories in direct support of the British military.[73] With society mobilized to support the war effort, it was essential to centralize and coordinate the production and delivery of goods to ensure a constant flow of support to the war effort in Europe. At the end of the war, the War Purchasing Commission and the Imperial Munitions Board were both dissolved. The acquisition process for the three services temporarily reverted back to the pre-war structure, with each having their own subordinate procurement organization since without the war throughput, the centralized coordination was no longer deemed essential. This system remained in place until 1923, when they were re-amalgamated into the new Department of National Defence in order to centralize policy development and enforcement as per the National Defence Act.[74] The individual environmental commands remained independent however, along with their own procurement practices. This system remained in place until just prior to the Second World War in 1939.

After allegations of corruption erupted in the procurement of the Bren Machine Gun, the Mackenzie King government acceded to recommendations from a Royal Commission and centralized the procurement and production agencies into the Defence Purchasing Board.[75] The Second World War broke out not three months later, greatly increasing war stock orders and overwhelming the restrictive practices of the Defence Purchasing Board, thus necessitating an organization with wider powers.[76] The government hastily established the War Supply Board in 1939 to mobilize and organize industry to support the war effort, including supplying Canada and the alliance.[77] Later in 1940, the board was replaced by the official Department of Munitions and Supply (Dept M&S) responsible to ensure fair war supply pricing as well as giving him the power to "compel manufacturers and construction contractors to do whatever the exigencies of the war demanded.[78] This also included the management of 28 defence production-related crown corporations.[79] The Dept M&S expanded in 1941 with the creation of the Army Engineer Design Branch, whose purpose was "to ensure close co-ordination between army engineering design on the one hand, and industrial production on the other."[80] Interestingly, this organization was staffed with "civilian engineering staff from industry and from the permanent army" and were responsible for the design and developmental testing to satisfy Army requirements stemming from the war.[81] As the war ended and

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[72] Auger. The Shell Committee was disbanded due to a corruption scandal.

[73] Auger. 2

[74] Auger, 'The Evolution of Defence Procurement: A Hundred-Year History'. 3. The Royal Canadian Air Force was established in 1919, as the "Air Board" and included their own administrative, policy, and procurement arm.

[75] Ibid.

[76] J. de N. Kennedy, *History of the Department of Munitions and Supply: Canada in the Second World War*, Book, Whole (Ottawa: E. Cloutier, King's Printer, 1950), 5.

[77] Auger. 4.

[78] Kennedy, *History of the Department* . . . 5.

[79] Kennedy, xvii.

[80] Kennedy. 52.

[81] Kennedy. 52–53.

funds and efforts were refocused towards reconstruction, the Department of Reconstruction and Supply was created through the amalgamation of the two namesake departments: Reconstruction with Munitions and Supply.[82] With diminishing federal coffers, a dedicated department for defence production and procurement seemed frivolous and was therefore disbanded, with powers redistributed to the new Industrial Defence Board for defence production and to the Canadian Commercial Corporation for defence procurement.[83] This re-organization was short-sighted however, since by 1950, the structure required an update once again. With renewed focus on CAF re-armament, this time, Prime Minister Louis St-Laurent opted for a familiar structure, mimicking the old Department of Munitions and Supplies with his own Department of Defence Production (DDP), which re-combined the production and procurement responsibilities.[84] Of particular interest at this stage was the DDP's responsibility for "encouraging the design, development and production in Canada of weapon systems and defence equipment in order to maintain a technologically advanced domestic defence industrial base."[85] Although defence capability requirements and production were controlled by government organizations in the past, this is the first record of the government's particular interest in maintaining their own defence industry.[86] The DDP remained in place for over a decade, while exercising additional functions upon completion of the Korean War, such as research and development and "production sharing with the United States . . . and cooperation with NATO."[87]

The next period of significant change occurred as a result of the 1962 Glassco Commission report on the overall organization of the Canadian Public Service sector, which included a recommendation for a national centralized agency for the coordination of the purchases from all federal departments.[88] The full implementation of the Glassco Commission recommendations took approximately ten years. In 1969, the Trudeau *Government Organization Act* officially created the Department of Supply and Services (DSS), which replaced the DDP and was responsible for the procurement of supplies and services for all federal departments.[89] In 1971, the Liberal government appointed a Management Review Group (MRG) to "address ship procurement. . . and. . . the civilian, military and defence research relationships, command and control, logistics and acquisition policies, cost and performance objectives, and relationships with other governmental departments."[90] The resulting report recommended the centralization of all

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[82] Auger, 'The Evolution of Defence Procurement: A Hundred-Year History'. 5

[83] Auger. 6

[84] Auger, 'The Evolution of Defence Procurement: A Hundred-Year History'. 6

[85] Auger. 7

[86] This concept reappears in the 1980s under the Mulroney government, with the creation of Industrial Regional Benefits (IRB).

[87] Auger, 'The Evolution of Defence Procurement: A Hundred-Year History'.7

[88] J. Grant Glassco, 'The Royal Commission on Government Organization. Vol. 2 : Supporting Services for Government', Monograph (Ottawa: Privy Council Office, 1962), 141, publications.gc.ca/pub?id=9.699799&sl=0.

[89] Auger, 'The Evolution of Defence Procurement: A Hundred-Year History'. 8

[90] G. M. Fyffe and Task Force on Review of Unification of the Canadian Armed Forces, 'Task Force on Review of Unification of the Canadian Forces: Final Report, 15 March 1980' (Ottawa: The Task Force, 1980), 31.

"military research, engineering, and procurement" under a new ADM within DND, so that it could "retain exclusive control over the procurement of military equipment as a direct result of the complex nature and expenditures involved complexity and cost."[91] The government actioned the MRG's recommendation and resourced the DM with two ADMs (ADM(Policy) and ADM(Materiel)) with a view to centralize power and communication up to the Minister of National Defence.[92] Notably, these ADMs would be appointed with military Associate Assistant Deputy Ministers at the rank of Major-General, in addition to "integrated military and civilian staffs with the object to ensure the determination of recommended policy and the interpretation of policy after it had been decided would have the essential military input.[93] In 1973, ADM(Mat)'s responsibilities expanded to include the department's logistics function.[94] The Materiel Group would be responsible to "[work] in close partnership with the DSS on all defence procurement projects, with DND and the DSS each responsible for specific aspects of the defence procurement process."[95] The responsibilities were relatively clear with DND as the technical authority and DSS as the contracting authority.

This division of responsibilities is consistent to this day, though the DSS is now Public Services and Procurement Canada (PSPC).[96] Additional parties were added to the defence procurement process in the mid-1970s. In response to a defence export deficit with the United States,[97] the Trudeau government introduced reciprocal benefits in the CP-140 Aurora program in 1975, which necessitated "intergovernmental representatives for industry," such as Industry Canada, as well as regional development agencies.[98] A decade later, the Mulroney government included the formal justification for Industrial Regional Benefits (IRB), later named Industry and Technological Benefits (ITB) within the 1987 *Challenge and Commitment: A Defence Policy for Canada*.[99] This complex

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[91] LCdr J I Findlater, 'Department of National Defence Equipment Procurement and Capital Acquisition in the 21st Century. A Study of the Defence Procurement Process and New Defence Procurement Strategy: A True Reformation or Merely Tentative Steps Forward?' (Masters Thesis, Toronto, Canadian Forces College, 2013). 33

[92] Daniel Gosselin, 'Listening to the Chief of the Defence Staff: The "Blurred" Boundaries of Military and Defence Advice', *Canadian Military Journal* 20, no. 4 (2020): 4–19.

[93] Loomis, 'The Canadian Forces and the Department in War and Peace: A Supporting Paper to the NDHQ Study S3/85 Report', 108.

[94] D. G. Loomis, 'The Impact of Integration, Unification and Restructuring on the Functions and Structure of National Defence Headquarters' (Ottawa: DND, 1985), 121.

[95] Auger, 'The Evolution of Defence Procurement: A Hundred-Year History'. 9

[96] The DSS merged with the Department of Public Works to become Public Works Governments Services Canada (PWGSC) in 1993, and subsequently renamed PSPC in 2015. Auger. 10

[97] James Fergusson, 'In Search of a Strategy: The Evolution of Canadian Defence Industrial and Regional Benefits Policy', in *The Economics of Offsets*, by Stephen Martin, 0 ed. (New York: Routledge, 1996), 111, https://doi.org/10.4324/9781315825038.

[98] Aaron Plamondon and John Robert Ferris, *Equipment Procurement in Canada and the Civil-Military Relationship: Past and Present* (Calgary, Alta.: Centre for Military and Strategic Studies, University of Calgary, 2008), 19.

[99] Department of National Defence, *Challenge and Commitment: A Defence Policy for Canada* (Ottawa: Minister of Supply and Services, 1987), 75. The policy included the requirement for a capable indigenous industrial base, cost and revenue sharing with international partners, and the desire to promote research and development in Canada.

dynamic consisted of the evaluation of defence requirements against both the total costs through a value assessment by PSPC, as well as an evaluation of the economic and technological benefits by government organizations representing international trade, commerce, science and technology, and regional industrial expansion.[100] Surprisingly, this multi-departmental procurement process withstood the economic restraints of the 1990s, as well as the battles fought in the Balkans and the war in Afghanistan: three events that historically would have caused significant change in the military procurement structure.

As procurement best practices continued to evolve through the 1990s, the ADM(Mat) structure changed along with it. In particular, as part of the Equipment Program Management concept, the 1994 Op EXCELERATE sought to "integrate all functions into equipment management teams (EMT) organized on a weapon system basis.[101] This included "its technical, supply, and procurement/finance staffs for the conduct of day to day life cycle materiel management.[102] ADM(Mat) also embraced the Defence Team concept through the adoption of Integrated Project Teams, which brought together all project stakeholders through the life of a project. This team consisted of the project manager, subject matter experts (SME), PSPC, and industry (supplier/manufacturer) representatives as applicable. Changes continued throughout the 1990s, with the establishment of the Management, Command and Control Re-engineering Team (MCCRT). This organization was given the mandate to "develop structural options and the implementation plan . . . to arrive at logical and innovative resource savings in both Headquarters and support functions," which resulted in a focus of reorganization towards process lines vice functional lines.[103] This resulted in drastic reductions to NDHQ staff as well as the "integration of Materiel Acquisition and Support service delivery and staff functions" within ADM(Mat).[104]

With the upcoming delivery of the National Shipbuilding Procurement Strategy (NSPS), the Harper government "commissioned the Canadian Association of Defence and Security Industries (CADSI) to offer suggestions about how to maximize the "return:

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[100] After numerous permutations over the last few decades, the responsibility for Industry and Technological Benefits now rests with the Department of Innovation, Science, and Economic Development (ISED) Canada, which is led by three separate ministers: minister of tourism, minister of innovation, science and industry, and the minister of international trade, export promotion, small business and Economic Development. Canada, 'Profile - Industry, Science and Technology', Parliament of Canada, accessed 17 June 2023, https://lop.parl.ca/sites/ParlInfo/default/en_CA/Federal/areasResponsibility/profile?depId=3903.

[101] V. Poter and Canada. Dept. of National Defence. Defence Management Committee, *National Defence analysis : procurement reform: Analyse de la Défense nationale : réforme de l'acquistion*, Book, Whole (Ottawa: Dept. of National Defence, 1999), 3.

[102] Poter and Canada. Dept. of National Defence. Defence Management Committee, 4.

[103] Command and Control Re-engineering Team Canada. Dept. of National Defence. Management, 'MCCRT Historical Report' (Ottawa: Dept. of National Defence, 1997), 3-4.

[104] Command and Control Re-engineering Team Canada. Dept. of National Defence. Management and Canada. Dept. of National Defence, 'MCCR information package for senior managers' (Ottawa: National Defence Headquarters, 1996), 15.

to Canada's industrial base".[105] In response to harsh criticism from CADSI, the Harper government released a new Defence Procurement Strategy (DPS) in 2014.[106] The Harper government then revitalized the *Financial Administration Act*, thereby placing the responsibility of the department's finance under complete civilian control. Thus, as retired Major-General Gosselin remarked: "the advisory role of the DM in areas of defence management, finances, procurement and audit became more exclusive and demanded greater specialized expertise."[107]

As the National Shipbuilding Strategy was launched in 2011, the government committed to long-term funding for the establishment and maintenance of national shipbuilding capability. This led to the creation of the Defence Procurement Strategy (DPS), the Harper government outlined three key objectives for defence procurement:

> Delivering the right equipment to the Canadian Armed Forces . . . in a timely manner; streamlining and modernizing defence procurement processes and ensuring coordinated decision-making; and leveraging defence equipment purchases to create jobs and economic growth for Canadians.[108]

Of the many initiatives introduced by this strategy, there are two in particular that impact the responsibilities of DND: 1. the mandate to publish an open-source annual Defence Acquisition Guide, later replaced with the Defence Capability Blueprint, which outlined the status of planned defence acquisitions; and 2. the creation of the Independent Review Panel for Defence Acquisition (IRPDA), responsible for reviewing and validating the high-level mandatory requirements (HLMR) outlined by the CAF for projects valued over $100 millions.[109] The introduction of a challenge function was seen by some as an example of the Harper government's continued mistrust of DND and the CAF.[110] Despite

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[105] Kim Richard Nossal, *Charlie Foxtrot: Fixing Defence Procurement in Canada* (Toronto, Ontario: Dundurn Press, 2016). 4-5

[106] Kim Richard Nossal. 4-5; 'Leveraging Defence Procurement to Create Jobs and Economic Growth in Canada - Canada.Ca', accessed 21 April 2023, https://www.canada.ca/en/news/archive/2014/03/leveraging-defence-procurement-create-jobs-economic-growth-canada-825559.html.

[107] Gosselin, 'Listening to the Chief of the Defence Staff: The "Blurred" Boundaries of Military and Defence Advice'. 15

[108] Public Services and Procurement Canada, 'Defence Procurement Strategy', Canada.ca, 3 November 2021, https://www.tpsgc-pwgsc.gc.ca/app-acq/amd-dp/samd-dps/index-eng.html.

[109] Auger, 'The Evolution of Defence Procurement: A Hundred-Year History'. 14; 'Leveraging Defence Procurement to Create Jobs and Economic Growth in Canada - Canada.Ca'. A third important initiative was also introduced which would increase DND's contracting authority. Due to the shear volume of contracts required by DND, and despite PSPC having "exclusive authority to buy or otherwise acquire defence supplies", in 2019, DND was granted independent authority to procure goods and services up to a total value of $7.5 million. DND sought independent contracting authority of up to $5 million as part of initiative 95 in the 2017 Defence Policy: Strong, Secure, Engaged. The intent of the initiative was to speed up the procurement process by limiting the quantity of mandated departmental interactions between DND, PSPC, and Innovation, Science, and Economic Development (ISED). This was omitted from further analysis, however, as it was more impactful to the interaction between DND, PSP, and Treasury Board, rather than responsibilities of the CAF specifically.

[110] Kim Richard Nossal, *Charlie Foxtrot: Fixing Defence Procurement in Canada*. 4-6

these claims, this challenge function did not have a significant negative impact on the CAF procurement cycle.

Interwoven throughout this transitionary period, there were simultaneous drastic changes to the DND structure. In response to the aforementioned Glassco report, in 1964, the Pearson government amended the *National Defence Act* to integrate the three CAF environment (RCN, CA, and RCAF) headquarters into a combined Canadian Forces Headquarters (CFHQ).[111] Two years later, the structure was adjusted with the following four branch heads reporting to the CDS: Vice Chief of Defence Staff, Chief of Personnel, Comptroller General, and, importantly for this paper, Chief of Technical Services.[112] In his address on the Canadian Forces Reorganization Act, Minister Hellyer described the Chief Technical Services' (CTS) responsibilities to include "engineering and development activity related to capital equipment programmes, plans and policies for the procurement, storage, distribution, inspection, maintenance and disposal of materiel; and for the design, provision and maintenance of accommodation and other military facilities."[113] The CTS also integrated the Defence Research Board for "defence research and for coordinating the military development programme."[114] In 1968, through the *Canadian Forces Reorganization Act*, the three complete armed services were merged into one service: the CAF.[115] Finally, in 1972, following the release of the *Report to the Minister of National Defence on the Management of Defence in Canada* by the Management Review Board, the last element of the Glassco commission recommendations were put in place, with the amalgamation of CFHQ and DND headquarters into a new National Defence Headquarters (NDHQ).[116] This effectively "consolidated civilian control over the armed forces by integrating civilian administration and military commands into a new organization", [117] which transferred the functional responsibilities of "planning, financial services, personnel, engineering and procurement" from senior military leaders to four assistant DMs (ADMs).[118]

This civilianization continued to propagate through the department. As highlighted in a 1986 Adelphi Papers for *The Organization for Defence and the Canadian Forces*:

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[111] Auger, 'The Evolution of Defence Procurement: A Hundred-Year History'. 8

[112] Paul Hellyer and Canada. Dept. of National Defence, *Address on the Canadian Forces Reorganization Act: The Honourable Paul Hellyer, Minister of National Defence, on Moving Second Reading of Bill C-243 in the House of Commons, December 7, 1966*, Book, Whole (Ottawa: House of Commons, 1966). 14

[113] Hellyer and Canada. Dept. of National Defence, 15.

[114] Ibid.16.

[115] Hellyer and Canada. Dept. of National Defence, *Address on the Canadian Forces Reorganization Act: The Honourable Paul Hellyer, Minister of National Defence, on Moving Second Reading of Bill C-243 in the House of Commons, December 7, 1966*.

[116] Auger, 'The Evolution of Defence Procurement: A Hundred-Year History'. 8

[117] Collins, *Defence Procurement Canada*, 5.

[118] Albert Legault et al., *Bringing the Canadian Armed Forces into the twenty-first century*, Book, Whole (Ottawa: Dept. of National Defence, 1997), 11.

> ADM(Pol) also has an interest in the Force Development Guides - the responsibility of each Chief (Maritime/Air/Land) of Doctrine and Operations - since these officers are to translate the Capabilities Planning Guidance into specific guidance for each of the operational environments.[119]

The implications of ADM(Pol)'s involvement in future defence policy has a direct impact on procurement as military planners rely on this policy and national defence strategies to identify future capability requirements for the CAF. These capability requirements are then used to justify HLMRs for program development and equipment acquisition.

Three decades after CAF unification, as the CAF embarked on an intensive battle in Afghanistan, the CDS at the time, General Rick Hillier, seized the initiative. He aggressively pursued CAF Transformation, operationalizing the CAF and expediting the procurement process to deliver equipment in the hands of CAF members fighting a real war. Recognizing that the CAF was ill-prepared for an Afghanistan-type counter-insurgency battle, Gen Hillier sought to look far ahead, anticipate future wars, and set-up the procurement system to deliver before the equipment was required. Previous military procurement cycles were reactive in nature, "basing equipment acquisition on capabilities that have been vital or unsatisfactory during previous missions."[120] Gen Hillier's transformation sought a new process: a proactive one. As part of General Hillier's Transformation initiative, he institutionalized the Force Development and Capability-Based Planning processes,[121] headed by the newly re-established Chief of Force Development (CFD) organization, "responsible to conduct future security studies and military capability analyses to be able to better shape future defence policies."[122] CFD currently functions as it was intended back in the early 2000s.

Over the years, there has been innumerable recommendations on how to "fix" defence procurement. Ex-ADM(Mat), Alan Williams, amongst others, had recommended the creation of an independent Defence Procurement Canada, with its own cabinet minister.[123] Michael Byers, the Canada Research Chair in Global Politics and International Law at the University of British Columbia, put forward the concept of strictly "off-the-shelf" defence procurement, with a view to eliminate development risk with "canadianization", while also eliminating the Mulroney IRB/ITBs and restricting

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[119] 'The Organization for Defence and the Canadian Forces', *The Adelphi Papers* 26, no. 214 (December 1986): 45–53, https://doi.org/10.1080/05679328608448762. 50

[120] Mark Rempel, 'An Overview of the Canadian Forces' Second Generation Capability-Based Planning Analytical Process', n.d. 1

[121] Debbie Blakeney et al., 'Operational Research Tools Supporting the Force Development Process for the Canadian Forces', *Information & Security: An International Journal* 23 (2009): 81–98, https://doi.org/201307310718. 1; Rempel, 'An Overview of the Canadian Forces' Second Generation Capability-Based Planning Analytical Process'. 1

[122] Gosselin, 'Listening to the Chief of the Defence Staff: The "Blurred" Boundaries of Military and Defence Advice'. 15

[123] Williams, *Reinventing Canadian Defence Procurement: A View from the Inside*, 104; Fetterly and Royal Military College of Canada. Graduate Studies and Research Division, 'Arming Canada: Defence Procurement for the 21st Century'.

sole-source contracting.[124] As expressed by MND John McCallum in the Advisory Committee on Administrative Efficiency for DND and the Canadian Forces, there is "cultural aversion to programmatic risk. . . resistance to all but the most incremental change".[125] This notion was reinforced most recently by the president of CADSI Christyn Cianfarani who suggested that DND not focus on "fixing" procurement, but just continuously improve it.[126] The problem appears to be too large to resolve all at once. Thus, the necessity to break down the problem into smaller parts. Understanding government has a role, as do other departments and government organizations such as PSPC and ISED, the CAF needs to focus internally on what is within its own control. As the owners of the operational requirements, the CAF is at the forefront of the entire procurement process. As the next section will illustrate, the CAF force development process is well developed, with ample potential to better shape the way for future procurement initiatives.

Force Development and Capability-Based Planning

Throughout the years, Canada has developed numerous defence policies from the 1971 White Paper on Defence to the most recent Strong, Secure, Engaged (SSE).[127] And there will soon be another update, with the government seeking input for a Defence Policy Update in response to the changing situation with the war in Ukraine.[128] These policies provide critical information to the CDS and DM, who then provide the strategy and direction of the CAF Future Force through the force development process. In particular, national policy allows military strategists and planners to interpret government intentions and apply them to specific military problem-sets, both current and anticipated.

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[124] Kim Richard Nossal, *Charlie Foxtrot: Fixing Defence Procurement in Canada*. 4-3

[125] Ibid. 4-3

[126] Ibid. 4-7

[127] 'Canada's Defence Policy Statements: Change and Continuity - HillNotes', accessed 30 March 2023, https://hillnotes.ca/2022/09/22/canadas-defence-policy-statements-change-and-continuity/.

[128] Canada, 'We Want to Hear from You - Canada.Ca', Canada.ca, accessed 30 March 2023, https://www.canada.ca/en/department-national-defence/corporate/policies-standards/canada-defence-policy/we-want-to-hear-from-you.html.

The complete force development process is illustrated at Figure 4.1 below. It comprises of four stages: conceive, design, build, and manage.[129] These stages are explicitly broken down into two groups: the *plan* (conceive and design) and the *programme* (build and manage). As alluded to in the previous section, the plan group is preceded by *policy*. As an instrument of the government, and exercised through ADM(Pol), this is period in which the environment is set for future CFD work. It behooves the CAF to be engaged in the determination of policy in order to ensure the boundaries of their force development efforts are realistic. As Richard Nossal illustrates in his book *Charlie Foxtrot: Fixing Defence Procurement in Canada*, civil servants are further and further removed from military service and tend to heavily rely on military advice.[130] Intuitively, this shouldn't

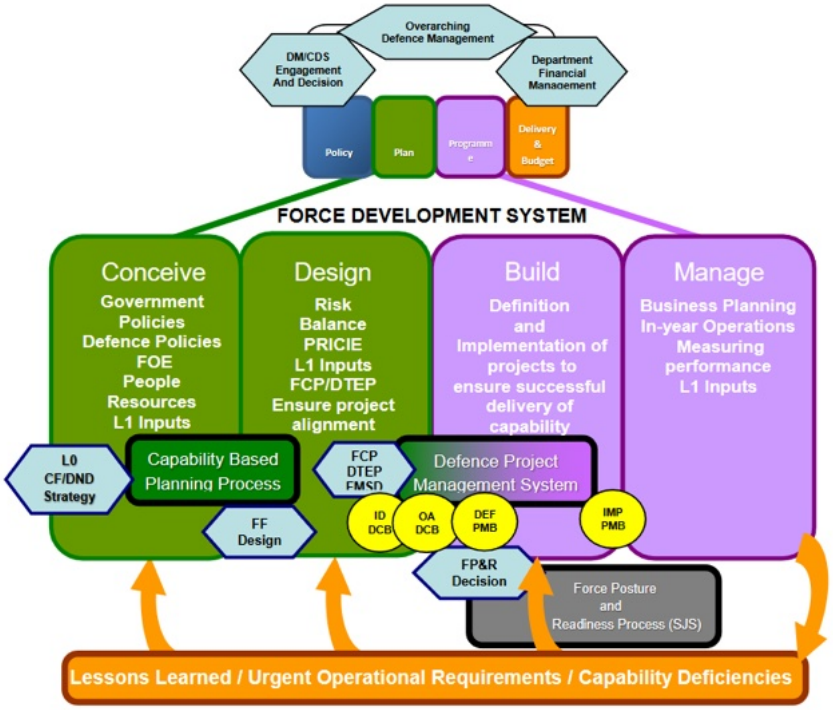

Figure 4.1 - Force Development System

Source: National Defence, 'Capability Based Planning Handbook', 2019. 13

be a problem, but as he further explains, it is after the policy is written and the CAF begins to ask for the funds to support the approved capabilities, that is when civil servants tend to recant their position.[131] Understandably, this creates tremendous risk to development programs, timely delivery of capabilities, and on a most basic level, wastes a tremendous amount of staff effort and time that could have otherwise been put to better use elsewhere. With an understanding of the importance of an enduring and

[129] National Defence, 'Capability Based Planning Handbook', 2019. 13
[130] Kim Richard Nossal, *Charlie Foxtrot: Fixing Defence Procurement in Canada*, 5-8.
[131] Ibid. 5-8,9

collaboratively developed national defence policy, appropriate and feasible plans can then be developed.

The first group of stages – plan – is the principle focus of CFD whose mandate is to "[h]armonize, synchronize and integrate the force development activities of the CAF in order to develop the capabilities required to produce strategically relevant, operationally responsive, and tactically decisive military forces."[132] Although there has been a recent push to transition to a Concept-Driven, Threat-Informed Planning Process (CDTIPP),[133] over the past few decades, the preferred method of planned defence acquisition was through the deliberate capability-based planning process, led by the CFD office reporting to the VCDS.[134] The CBP consists of three phases presented in Figure 4.2 below.

The first phase is to establish context. This begins with the development of a future security environment (FSE), whereby, through detailed research and analysis of the current environment, military strategists "[describe] the likely global security

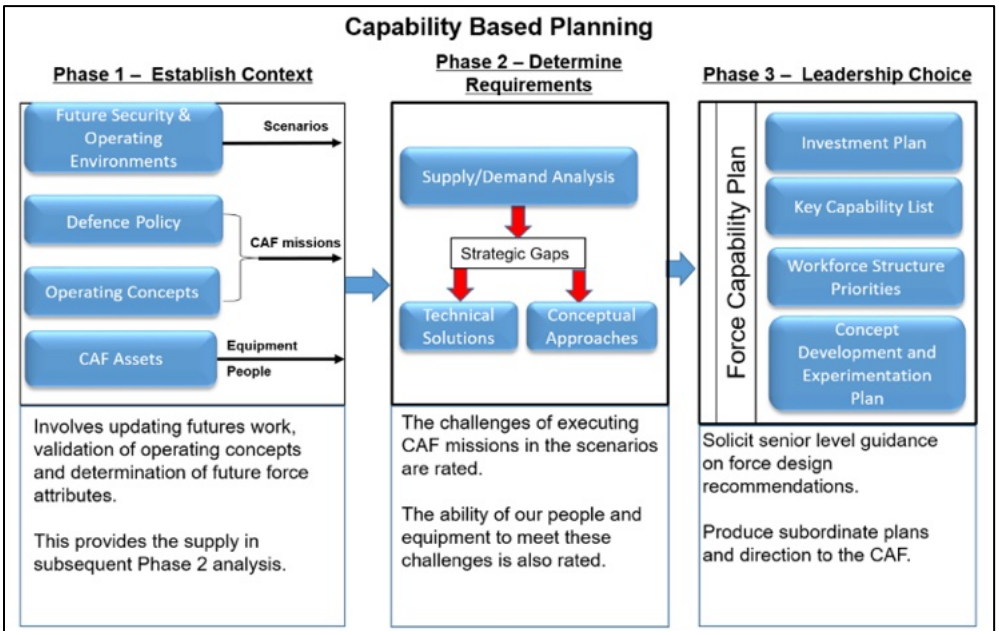

Figure 4.2 - Capability Based Planning Model from the Chief Force Development

Source*:* National Defence*. Capability Based Planning Handbook*. 4

[132] Department of National Defence, *Project Approval Directive*, version 1.1 (Ottawa: DND, 2019). 78

[133] Director of Capability Analysis, 'A PRIMER ON CONCEPTS: Concept Note 22-01', 14 November 2022. 4 This debate is principally due to the existence of a real threat from Russia, and more recently, China. The argument is that, although the concepts are still important, they can and now should be applied to known threats, as opposed to the post-Cold War era when there were no known or real anticipated threats.

[134] Loomis, 'The Impact of Integration, Unification and Restructuring on the Functions and Structure of National Defence Headquarters', 163.

environment and... military implications of that environment in terms of the CAF."[135] The next step is the development of the future operating environment (FOE), where the likely actions and capabilities of potential adversaries "in conjunction with emerging and evolving technologies" are described.[136] Lastly, using the most recently published defence policy – currently SSE – CFD then develops force development scenario sets (FDSS). Joint Capability Planning Teams (JCPT), consisting of subject matter experts and key stakeholders, conduct a tailored Operational Planning Process (OPP) to help develop an Operation Design for which capabilities will be explored to satisfy the identified mission critical tasks and decisive points.[137] At this phase, a significant amount of professional military judgement is employed to determine the optimal force element and force package requirements to solve the particular scenario.[138] The end result of the conceive stage for CFD is a CBP Final Report, which serves to inform senior military decision-makers on the "CAF capability portfolio" and options therein, including associated risks and opportunities.[139] The CBP Final Report and the efforts that were exhausted through its development help inform Future Force Design, supports the Force Capability Plan, and enhances capability management, which bleeds into the next stage: design.[140]

Overall, the CAF Force Development process is effective, as noted by the 2021 Integrated Strategic Analysis Force Development report conducted by ADM (Review Services (RS)).[141] Nonetheless, there were a few issues identified that suggest a need to dedicate additional personnel to the force development system. In particular, there were reports of a lack of understanding of the overall PRICIEG evaluation process, a lack of integration and collaboration with other government departments and multinational partners, and "limited allocation of resources to the front-end of the capability development process."[142] As part of the extended report, ADM(RS) recommended "that VCDS conduct a training needs analysis for capability development staff, which should then influence selection, assignment, training and core activities."[143] The CAF has worked to resolve some of these issues, though staffing remains an issue at all levels, as outlined in Chapter 2, and, as a biproduct, there is insufficient personnel to deliver and/or receive appropriate training, and there are too few remaining in positions to maintain the skillset. The CAF has looked to address the collaboration issue through joint-level concept documentation. Most recently, the VCDS released the Joint Intelligence Surveillance Reconnaissance (JISR) Future Concepts Environment that highlights the

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[135] National Defence, 'Capability Based Planning Handbook'. 4. This will be called CBP Handbook.
[136] Ibid. 4
[137] Ibid. 5
[138] Ibid.
[139] CBP Handbook. 39
[140] CBP Handbook. 40
[141] Department of National Defence, 'Integrated Strategic Analysis Force Development', Integrated Strategic Analysis (Ottawa: ADM(RS), November 2021), https://publications.gc.ca/collections/collection_2022/mdn-dnd/D2-610-2021-eng.pdf. This will be called ISAFD.
[142] ISAFD. 11, 13, 14
[143] Department of National Defence. Assistant Deputy Minister (Review Services), 'Evaluation of Defence Capability Development Program' (Ottawa: DND, November 2017). A4

responsibility for the "identification of evolving JISR requirements" and "to integrate and reinforce the JISR enterprise at all levels."[144] The new focus on JISR presents a new challenge and opportunity for the CAF to build a better framework for collaborative force development, one that, however, would necessitate even greater personnel and resource investment. Although the JISR concept is in its infancy, there are several projects within the framework that have moved into the *design* stage.

Defence Project Management System

It is at the *design* stage when the Defence Project Management System is introduced. The system flows from the *Defence Procurement Act*, which governs the policy behind the Project Approval Directive (PAD) and the Procurement Administration Manual (PAM). The PAD outlines five phases of a project life-cycle: Identification (ID), Options Analysis (OA), Definition (Def), Implementation (Imp), and finally Close-Out (Close), as illustrated at Figure 4.3.[145]

Figure 4.3 – Project Approval Process

Source: Department of National Defence. Project Approval Directive, 53

The first two phases, ID and OA, remain the purview and responsibility of the sponsor within the CAF. According to the PAD, projects may be initiated by four sources: 1. directed by government; 2. proposed by the operational community, through a Statement of Capability Deficiency; 3. proposed by the business community, due to imminent obsolescence or rapid technological advancement; or 4. Identified through the CBP process.[146] Since despite unification in 1968, the environments have maintained their own forward-looking organizations, the typical project initiation occurs from the bottom-up from the operational community or through their environmental future concept development process. The CA staffs a CA Land Warfare Centre (CALWC) to conceptualize the army of the future. At the joint level, the CAF has initiated a Joint Operations Fusion Laboratory (JOFL) which is intended to support the following:

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[144] Department of National Defence, *Joint Intelligence, Surveillance and Reconnaissance Future Operating Concept* (Ottawa: Chief Combat Systems Integration, 2022). 22

[145] Canada. Department of National Defence, *PAD*. 53. This will be called PAD.

[146] PAD. 78.

- Testing and confirming JISR interoperability;
- Understanding how the operator will utilize new technology;
- Operational procedures development; and
- Testing novel S&T concepts and evaluating their potential.[147]

Each environmental sub-organization works directly with their own Force Development Directorates to identify capability gaps and manners in which they could be filled. These offices tie in directly with CFD and support the capability development process as stakeholders. This ensures that all capability gaps are being considered comprehensively at the highest levels of the CAF at the Defence Capability Board. The CA employs their own Director of Land Force Development (DLFD) to "conduct detailed analysis and build of CA Force Structures and the integration of capabilities and resources into the structures."[148] This analysis includes the support to PRICIE+G analysis.[149] These considerations inform the development and evaluation of options to satisfy the capability gap. Although environmental development staff provide a valuable function and help prepare the institution for the implementation of structural changes and equipment distribution, there are several reported deficiencies. As part of the ADM(RS) evaluation of the overall CAF Force Development process, each environmental force development office was also reviewed. The report highlighted a few key issues:

> perceived limited resources and training in the [Land Force Development] LFD program. . . a perceived lack of resources (both financial and [full-time equivalencies] FTE) . . . [and] resource/capacity trade-offs were felt by LFD representatives.[150]

These observations are consistent with the assessment of CFD with a focus on the quantity and training of staff, and reinforced by an 2016-2017 Annual Report from Independent Review Panel for Defence Acquisition.[151] The first ADM(RS) observation implies a need to front-load staff in the capability development continuum to ensure that

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[147] Department of National Defence, *Joint Intelligence, Surveillance and Reconnaissance Future Operating Concept*. 22

[148] 'Director of Land Force Development', Army Collaborative Information Management System (ACIMS), accessed 7 May 2023, https://acims.mil.ca/org/DLFD/Default.aspx.

[149] PAD. 82. PRICIEG is an anagram to assist force developers carefully analyse dependencies and second and third order effects of a proposed project. PRICIEG stands for the following: P-personnel, leadership, individual training; R-research and development, operational research; I-infrastructure and environment; C-concepts, doctrine, collective training; I-information management and information technology; E-equipment, support and sustainability; and G-gender-based analysis plus (GBA+).

[150] Department of National Defence. Assistant Deputy Minister (Review Services), 'Evaluation of Land Force Development' (Ottawa: DND, November 2021). 19

[151] Independent Review Panel for Defence Acquisition, 'Annual Report 2016-2017' (IRPDA), 7, accessed 7 May 2023, https://www.canada.ca/en/independent-review-panel-defence-acquisition/corporate/reports-publications/irpda-report-2016-2017.html. The panel recommended additional support and resourcing for force development staff during the options analysis phase.

the effort dedicated later in the development cycle are working on the right things. The second is that in order for staff to conduct proper resource/capacity trade-offs, a foundational understanding of operational requirements is required, thus necessitating applicable military experience. In other words, DLFD requires more of the *right* people. For the CA, DLFD continues to do what it can and maintains involvement throughout the initial phases of a project, but the key responsibility on behalf of the sponsor rests on the Project Director (PD).

As a direct representative of the operational environment, the PD position is reserved for military members with experience operating in the space within which the capability gap exists and/or is most likely to have experience operating the system being replaced or upgraded. As the functional authority for operational requirements, the PD must exercise professional military judgement in a manner similar to the Chief Force Development officers. They report through the military chain of command in the environmental requirements directorate up to their Environmental Commanders and speak on their behalf to the project team. In reviewing the responsibilities of the PD in Annex C, it is clear that the PD role must be performed by a military member.[152]

Often, even before CFD – or DLFD for the CA – has identified a capability gap, a PD is already investigating technologies as a secondary duty beyond their responsibility of advising on a project in a later phase of the project life-cycle. This effort is considered pre-identification work and provides the opportunity to feed information from the ground-level up to the capability developers. Consider the Leopard 2 Tank Replacement Project. According to the Defence Services Program, the project was slated for Close-Out in 2018, but DLR 3 has continuously had a Project Director working on Leopard 2 tanks. From the Afghanistan Urgent Operational Requirement (UOR), to the Tank Replacement Project (TRP) charged with replacing the leased tanks, through the procurement of implements (mine rollers and ploughs), Project Directors were in the middle of it all. Now, as the TRP ends, a position is maintained at DLR to support Tank Life Extension (Tank LE), with a view to investigate future ground-based mechanized direct fire platform options and inform the capability development process. Currently, Tank LE is in the pre-identification phase, where it has not yet been prioritized for funding as part of the Capital Investment Program Plan Review (CIPPR).[153]

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[152] Many of the responsibilities of the PD may be supported by a civil servant, such as the formatting and prose required for the official project document submissions as well as the data updates to the DSP portal and requirements tracking systems. This civil servant could be either contracted for the term of a particular project or hired as an indeterminate position in support of the continuity of the Defence Services Program at the Level 1 requirements offices. To this end, the CA has acknowledged this particular dynamic and has requested civilian support in their 2024 Defence Team Establishment Plan submission. Canada. Department of National Defence, 'Canadian Army Defence Team Establishment Plan Submission 2024 (Draft)' (CA, 24 August 2022).

[153] CIPPR is a system consisting of a process by which information about potential projects is entered into an online tracking system. All projects are then reviewed by the Investment and Resource Management Committee for prioritization to be added to the Defence Investment Plan. Canada. Department of National Defence, PAD, 150.

The bulk of the PD's responsibilities take place during the Identification phase, as illustrated in the responsibilities table at Annex D. It is important to note that there are no particular barriers to entry in to the Identification phase;[154] it is generally just the state at which the requirements directorate commits the resources to complete the work associated with getting a project from the Identification to Options Analysis phase. During Identification, the PD is the project leader and is responsible for the management and submission of all project documents, including the CIPPR submission, Strategic Context Document (SCD), including the High Level Mandatory Requirements (HLMRs),[155] the Project Complexity and Risk Assessment (PCRA), the Project Management Plan etc...[156] Once a proposal has been prioritized in CIPPR and included in the Defence Investment Plan, then the PD may submit a completed SCD to the VCDS-chaired Defence Capabilities Board (DCB).[157] If endorsed, the project gains approval to transition to the Options Analysis phase.[158]

At this point, the environmental requirements directorates work to identify specific technologies that could fill the capability gap. For solutions that comprise equipment, these options generally consist of an upgrade to existing equipment, foreign military sales, commercial-off-the-shelf (COTS) procurement,[159] or a brand-new acquisition typically with Canadian design considerations. The options are evaluated against the HLMRs and presented to DND/CAF senior leaders at the DCB 2, along with a completed Business Case Analysis. DCB 2 would then be responsible for endorsing the project to enter the *Transition to Definition* phase. During this transition, the total cost of the project and overall complexity determines whether or not a Treasury Board (TB) submission is required.[160] It is after this transition phase where project leadership is transferred from the PD to the Project Manager (PM).

With a procurement strategy in place, and the PM in the lead, the project team now shifts focus from what should be done to how it will be delivered and implemented.[161] The key outputs include the Project Management Plan with a Work Breakdown Structure and subordinate project plans, a finalized Statement of Operational Requirements (SOR) and the development of the implementation phase paperwork, including the request for proposal, the statement of work, technical specification, and bid

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[154] PAD. 79.

[155] As per the PAD, "High Level Mandatory Requirements (HLMR) are foundational statements of specific capabilities required by the CAF to meet government defence policy objectives, and they thereby set out the core objectives of a project." Essentially, if the HLMRs are not attainable, then the project ceases to retain value to the CAF. Canada. Department of National Defence, 153.

[156] PAD. 79.

[157] PAD, 151.

[158] Projects with an estimated cost above $100M or with a Project Complexity and Risk Assessment (PCRA) beyond DND authorities must present to the IRPDA for confirmation of the capability gap to be filled, the HLMRs, and the procurement context both prior to transitioning to Options Analysis and in order to get through to Definition. Canada. Department of National Defence, 39.

[159] Commercial-off-the-shelf is a DND term for equipment that is not specifically designed for military application nor necessarily taking into consideration all military environments.

[160] The current cost basis for TB review is $25M.

[161] PAD, 122.

evaluation plan.[162] The typical factors of evaluation include the life-cycle cost, evaluated by PSPC, the Industrial and Technological Benefits (ITB), evaluated by Innovation, Science and Economic Development (ISED), and the capability technical factors, evaluated by the technical authority – the Project Manager – with consideration from the Project Sponsor – the PD.[163] With a successful bidder and funding confirmed in accordance with expenditure authorities, the project then moves into the Implementation phase.

During this phase, the PM and their team, along with support from the PD, works with the contractor to complete all design reviews as required and delivers the equipment in accordance with the Project Sponsor's fielding requirements. Once all project requirements have been satisfied and delivered, with the Initial and Final Operational Capabilities certified by the PD, the project then transitions into the Close-Out stage, where all final paperwork is completed and the project staff are all reallocated to other projects.[164]

Conclusion

This chapter provided a history of procurement in Canada, highlighting the increased civilian control of the process over the years. Beginning with the services each having their own independent procurement processes, to the unification of the forces and subsequent amalgamation of the Canadian Forces Headquarters with National Defence Headquarters, from which ADM (Pol) and ADM (Mat) were born.

The force development process was then reviewed, highlighting the importance of military involvement in policy decision making, while also stressing the value of professional military judgement in the determination of future capabilities. Staffing and training challenges within the CAF force development teams were also highlighted, both at CFD and subordinated environmental development teams, such as DLFD. The importance of military experience was again highlighted in the responsibilities of the PD, as the owner/representative of the SOR and HLMRs throughout the project approval process. Lastly, the responsibilities of PM were briefly analysed, highlighting the bureaucratic process through which the PM has to navigate: the development of Program Management Plans, Statements of Work (SOW), Requests for Proposals, and collaboration with PSPC and ISED to conduct bid evaluations. During the implementation, the PM responsibilities broadened into ensuring design reviews adhered to the technical specification while supporting the PD in the delivery of the final product to the end user. The PM responsibilities ended with the project close-out paperwork, another administrative yet necessary burden.

The next chapter will explore the greater ADM(Mat) organization within which the PM and the project teams operate.

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[162] Ibid. 122–28.
[163] PAD. 128.
[164] Ibid. 129–37.

CHAPTER 5 – MILITARY PERSONNEL IN ADM(MAT)

Introduction

The last chapter highlighted the responsibilities of CAF members in the overall force development and procurement process. Several ADM(RS) investigations and IRPDA annual report observations noted that despite the CAF having a functional force development system, there are still many inefficiencies in the process that could be corrected through proper training, support, and staffing. Further, upon exploring the project approval process, Chapter 4 highlighted the necessity of military experience in the force development and requirements definition process. What was not observed was the necessity for military experience in the project management portfolio. Therefore, in this chapter, the ADM(Mat) construct will be examined with a view to determine the criticality of such a large presence of military personnel within the organization.

Introduction to ADM(Mat)

ADM(Mat) is directed by a civilian at the Executive level who reports directly to the DM of National Defence. The ADM manages over 6700 positions with over 5000 civilian and over 1600 military.[165] Of these, only 3661 civilian and 1212 military positions are occupied, representing a shortage of approximately 25%.[166] As the Departmental Functional Authority for material and equipment, they are responsible for the acquisition, life-cycle management, and disposal of all DND material resources.[167]

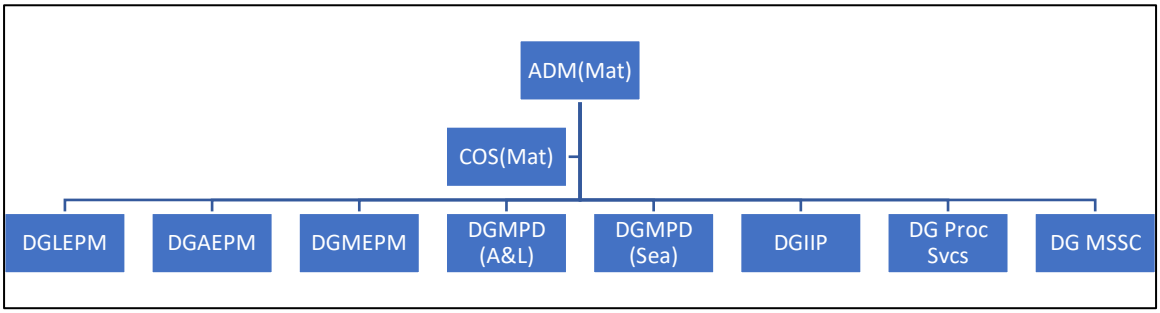

Figure 5.1 – ADM(Mat) Organizational Structure

Source: Department of National Defence Assistant Deputy Minister (Materiel), *Organization Chart – ADM (Materiel),* 8 October 2022

The organization is structured into eight Director-General (DG)-level sections, as well as a Chief of Staff section as outlined in Figure 5.1 below.[168] Each DG is responsible for the

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[165] Department of National Defence., 'Military Command Software Establishment'.

[166] Department of National Defence, 'HRMS' (Ottawa: DND, 31 December 2022).

[167] 'Senior Advisors – Overview and Priorities - Canada.Ca', accessed 22 March 2023, https://www.canada.ca/en/department-national-defence/corporate/reports-publications/transition-materials/mnd-transition-material-2021-dnd/tab13-senior-advisors-overview-priorities.html.

[168] Department of National Defence. Assistant Deputy Minister (Materiel), 'Organization Chart - ADM (Materiel)', 8 October 2022.

management of the projects under their directorship as well as the life-cycle management of the equipment within their respective portfolios. Three of the eight DGs correlate directly to the CAF environments and have responsibility for their equipment, materials, and supplies: DGLEPM is responsive to the CA; DG Aerospace Equipment Program Management (DGAEPM) is responsive to the RCAF; and DG Maritime Equipment Program Management (DGMEPM) is responsive to the RCN. Major acquisition projects for the environments are centralized into two of the other eight DGs: DG Major Project Delivery (Air and Land) (DGMPD(A&L)) and DGMPD (Sea).[169] The particularity with the latter two DGs is that they do not comprise Equipment or Weapon System Management Teams; when these major project DGs deliver the equipment, the life-cycle management and disposal responsibilities are handed over to the three environment-aligned DGs. The five aforementioned DGs are otherwise relatively similar with their responsibilities to procure and manage equipment in accordance with the Defence Procurement Policy and the processes outlined in the PAD. Military members are present throughout ADM(Mat), though they are most prevalent in the acquisition teams or as part of the in-service-support or life-cycle/weapons systems management teams.

ADM(Mat) Military Personnel Challenge

There are many arguments frequently used when insisting the necessity for CAF engineers within the ADM(Mat) project teams. Firstly, the CAF is always available to support and fill personnel gaps whenever, wherever required. Having military personnel available and dedicated to reinforce procurement staff ensures critical tasks are always achievable, even in the project environment. Secondly, civilians are reportedly unfamiliar with the operational environment within which the equipment is be employed, therefore incapable – or less capable – of visualizing the employment of the system. This could result in a civilian engineer unknowingly accepting operational risk that may have otherwise been anticipated. As operational requirements are defined in capability terms, CAF engineers are required to interpret these requirements and translate them into technical specifications. The nuance in language of operational terms may be foreign to civilian staff and therefore would necessitate the CAF engineer to act as an interpreter. Thirdly, CAF engineers are required to define the supportability as well as the reliability, availability, maintainability, and durability (RAMD) requirements of the system during the Definition phase. Fourthly, CAF engineers require the exposure at ADM(Mat) as part of their career development. Lastly, CAF engineers provide a fresh viewpoint as they are newly posted into a project every two to three years. All five of these potential advantages will be explored.

From deployments in response to natural disasters at home or around the world, to pandemic support, to full-on war, the CAF is always ready. This degree of readiness, however, presents un unrealistic expectation of the overall military capacity. In a speech at the Kingston Conference on International Security in October of 2021, Acting CDS at

[169] The three remaining DGs are DG International Industry Programs (DGIIP), DG Procurement Services (DG Proc Svcs), and DG Material Systems and Supply Chain (DGMSSC). These DGs are staffed principally with non-military engineering personnel and were therefore not further investigated within the scope of this paper.

the time, General Wayne Eyre, stated openly, "the CAF has in recent years gone from being the force of last resort to often a force of first choice."[170] He further questioned if Canadians needed to review the roles and responsibilities of the defence institution, with a view to allowing the CAF to "prioritize [their] force development, training, and readiness."[171] Military members can no longer afford to be employed as *the easy button*. This dependency has been applied to institutional support; in this case, augmentation to ADM(Mat). The last chapter presented a general timeline for the establishment of a Project Management Plan, which includes the determination of the staffing options (quantify and qualifications) of the project team. At Figure 5.2 below, ADM(Mat) contractor Denis Bertrand designed a New Project Organization Design Process diagram to help guide the project leadership in designing their team. With support from the Project Management Support Office, the PM and PD can determine who they may require with more fidelity as the project transitions through Options Analysis and into Definition. The challenge for the PM is in the sequencing of the arrival of staff in consideration of the lengthy bureaucratic process of pushing the project through a phase gate.

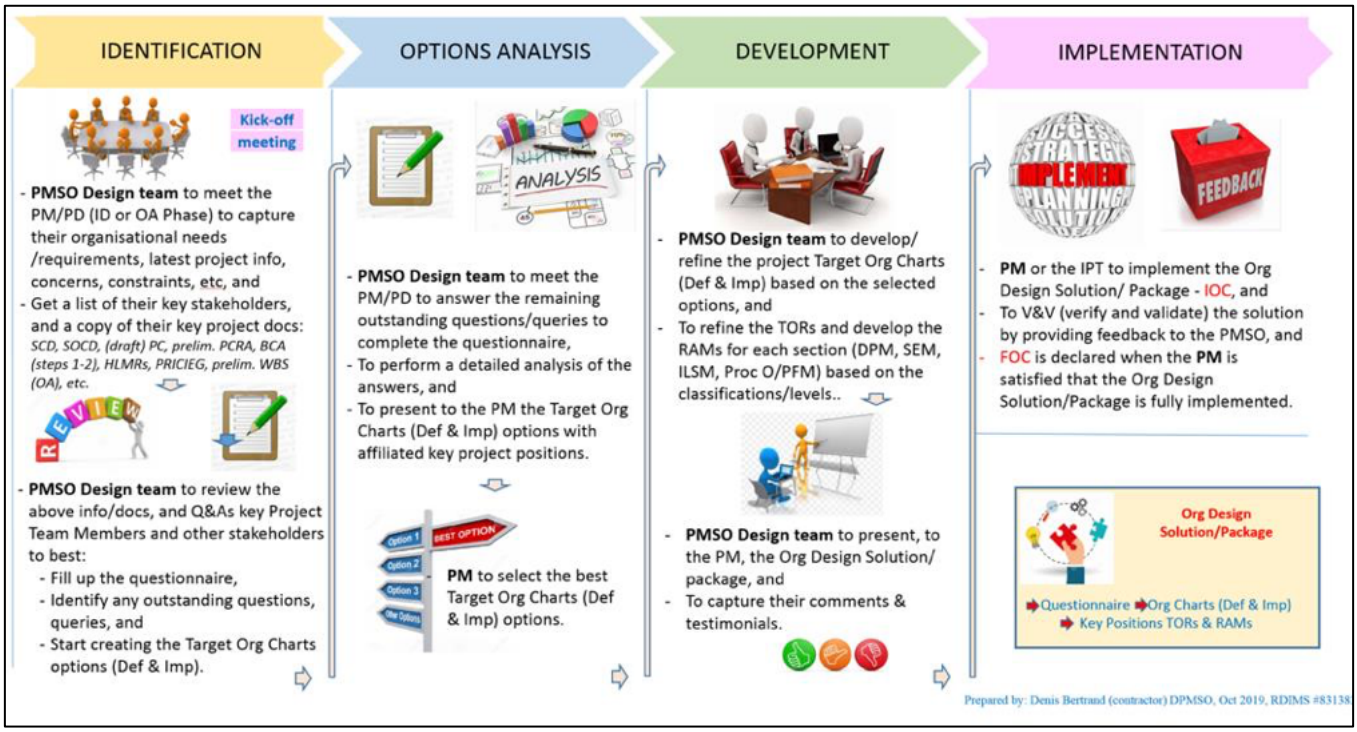

Figure 5.2 – New Project Design Process

Source: ADM(Mat), PMSO PMO Org Design Tool (RDIMS WME#879450)

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[170] Gen Wayne Eyre, CDS, 'Speech by Acting Chief of the Defence Staff, General Wayne Eyre, at the - Canada.Ca' (Kingston Ontario, 25 October 2021), https://www.canada.ca/en/department-national-defence/news/2021/11/speech-by-acting-chief-of-the-defence-staff-general-wayne-eyre-at-the-kingston-conference-on-international-security.html.

[171] Gen Wayne Eyre, CDS.

Although the gating process to get from one phase of the procurement process to another provides a great vector check for senior decision-makers, it impedes the ability of the project to flow smoothly through the conceive, design, build, and manage stages of the force development process. As projects make their way through each gate, the project solution becomes more and more clear; however, until a project actually gets through the gate, the project timelines are nothing but estimates and regularly shift quite considerably. This indeterminate schedule prohibits the establishment of appropriate staffing levels for each stage of the project's development. And this is where the CAF absorbs the risk. By design, in response to frequent happenstance, the CAF is able to manage its personnel in the manner to best achieve its overall objectives. Since procurement is notoriously a challenge, the CAF reserves the flexibility to strategically post military members into ADM(Mat) as project staff so the project does not have to depend solely on ADM(Mat) to ensure the availability of staff at the right time.[172] This self-sacrifice of the CAF to augment ADM(Mat) is now proving to be detrimental to the overall efficiency of both organizations: ADM(Mat) and the CAF. Since the CAF has made their personnel available to support projects, they have created a procurement system dependency, whereby ADM(Mat) knows that CAF members can be made available and therefore they have less pressure to devise a solution to leverage civilian engineers. The CAF continues to seek to solve government problems within their own means rather than support the government with the identification of alternatives to CAF member employment. A potential solution in this case could be to contract project staff while maintaining matrixed positions of functional experts within ADM(Mat), through whom the contracted project staff could be managed and supported.[173]

Unless they have served in the military previously, civilians will definitively have a degree of inexperience with military equipment in an operational environment. The reality, however, is there is no guarantee that CAF engineers have operated similar equipment in an operational environment either. For example, a RCEME officer working on a 155mm howitzer replacement who has never served with an artillery regiment would not necessarily understand the tactical and operational considerations of employing and maintaining that equipment in the field. Through the *strategic* employment of CAF engineers, ADM(Mat) could try to facilitate employing CAF engineers in areas of familiarity, but this should not be necessary. The CA formally trains PDs for employment at their requirements directorate, DLR. PDs undergo the Army Technical Staff Officer Program, which is a year-long post-graduate-level course through the RMC's Department

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[172] As part of the management of human resources plan, the JUSTAS project team acknowledged the need for "strategic use of the Canadian Forces career management process." Canada. Department of National Defence, 'Project Profile and Risk Assessment - Joint UAV Surveillance Target Acquisition System (JUSTAS)' (Department of National Defence, 25 May 2010), 28.

[173] ADM(Mat) has already incorporated a similar system through their Project Management Support Office; however, this should be applied by design, not reactionary to a temporary gap in personnel availability. 'Project Management Support Organization', Assistant Deputy Minister Materiel, accessed 7 May 2023, materiel.mil.ca/en/business-functions-project-management/project-management-support-office.page.

of Applied Military Science.[174] This program educates them on relevant military technologies, it teaches them to critically analyze technological claims, and it introduces them to the procurement process. By default, the PD is the operational requirements voice of the project. If there is an employment consideration or design flaw, it is up to the PD to recognize this risk, confer with operational or support experts within their respective environment and work with the project team to devise a solution. Without the operational experience, CAF engineers are unable to provide this critical feedback and thus their explicit military experience is redundant.

In accordance with the PAD, requirement identification and maintenance are the responsibility of the Project Sponsor and not the Project Implementer, thus CAF engineers employed as PMs are out of place if they are defining requirements.[175] The optimal scenario is that they effectively translate capability requirements into technical requirements. But in the worst-case, CAF engineers could over-reach and impart ill-conceived military judgement on an operational issue, without having the oversight of the Project Sponsor. A particular example is the definition of requirements for a maintenance variant of a vehicle platform. As RCEME officers, members of the project staff would generally have intricate knowledge of the vehicle capability requirements; however, these may not align with the overall capability gap to be filled as identified by the environmental force developers. There is a danger in this scenario that the Project Implementer devises a solution without the authority or approval of the Project Sponsor. The one particular aspect that CAF engineers are essential, as well as logisticians for that matter, is the identification of the supportability requirements of new systems. Nonetheless, these are still requirements and, as such, are the purview of the Project Sponsor. The solution, therefore, would be to ensure proper CAF engineer and logistics representation within respective environmental requirements directorates. Currently, in the CA's DLR, there is only one serving RCEME officer.[176] Requirements staff play an essential role throughout the development of the project. Further, as defence procurement reform initiatives such as evolutionary acquisition, incremental acquisition, and spiral development are entertained,[177] requirements staff will have to be formally integrated and

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[174] Canada, 'Programmes - Department of Applied Military Science of the Royal Military College of Canada', Royal Military College of Canada, accessed 1 May 2023, https://www.rmc-cmr.ca/en/applied-military-science/programmes-department-applied-military-science-royal-military-college.

[175] PAD. 45

[176] The only DLR position assigned to the RCEME Career Manager to manage is the PD Enhanced Recovery Vehicle (ERV).

[177] Fetterly and Royal Military College of Canada. Graduate Studies and Research Division, 'Arming Canada: Defence Procurement for the 21st Century', 327–40. Evolutionary acquisition would see the delivery of a capability, with additional planned improvements taking place in through a defined period. Similar to Evolutionary Acquisition, Incremental Acquisitions would see the delivery of a capability, though the project would be established to accept additional capabilities over time as technologies improve to a planned end state. Spiral development also accepts incremental changes, however, in this process, the end state is unknown. In all three processes, the requirements need to be addressed on a continual basis, thus the necessity for integrated requirements staff.

actively participate in all project team activities. Without a requirement definition function, the requirement for a PM's military experience is negligible.[178]

As presented in great detail in Chapter 3, the RCEME Corps relies heavily on ADM(Mat) for the career progression of their officers, which is similar if not even more pronounced in the AERE and NAV ENG occupations. If RCEME officers, for example, were to focus on their occupational group alongside logisticians, vice project management, they could continue to progressive actively within the CAF system. Although there would be more competition for these higher-level positions, it would force the better officers to perform. This avenue would also permit CAF engineers to remain collocated with their formations and divisions (wings, ships, etc. . .), vice being pulled to and from the National Capital Region to work at ADM(Mat). As highlighted in Chapter 2, the reality of the modern-day CAF is that there are insufficient mid-rank officers to fulfill all the current responsibilities, and there is marginal risk of complete CAF mobilization to the extent of requiring four hundred plus RCEME officers with procurement experience. Further, increased recruitment to fill existing vacancies at senior Capt and junior Maj positions requires long-term vision and commitment. Due to the nature of the CAF experience and promotion system, it would take at least eight years to for a new RCEME Officer Cadet (OCdt) to gain sufficient training and experience to manage a project.[179] Establishing a career model that entrenches CAF Engineers or Logisticians in an administrative role is thus not in the best interest of the CAF, not the members in question.

The argument of adding fresh ideas to a project team is not without some merit as project staff may be prone to stagnate in their approach. However, relying on CAF engineers to provide this input is not a solution. There are ample ways to inject new ideas into a project team, to include rotating select civilian staff between projects at specific intervals. Further, the PD is not likely to remain consistent for the life of a project. In many projects, the PD is informally seconded to the project team and, as such, has ample opportunity to continuously inject a fresh perspective.

CAF engineers definitely provide value to the project teams and their participation in projects certainly provides value back to themselves and the military organizations they serve. This *value*, however, comes at a cost. There is a lack of personnel throughout the CAF ranks and, as explained above, new recruits do not become Majs overnight.

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[178] There are many qualities of military members that are transferable to project management. With a proper civilian personnel development and training process in ADM(Mat), acquisition staff could also build the same or similar qualities as their military counterparts, thereby negating the military factor advantage.

[179] The eight-year estimate assumes the OCdt graduated through the DEO system, spends the minimum time in rank and in each position, dedicates themselves to both military and professional development on their own time, and performs each job at a mastered level.

CAF Member Drawbacks

With the five expected advantages of CAF officers refuted, this section presented four additional drawbacks from their employment in ADM(Mat). The biggest challenge is the constant posting process of military staff, which has three sub-impacts. First, changing positions every two or three years creates a large stress on an organization already struggling to maintain expertise. Second, the military posting process impedes on the members' ability to become true program management professionals; it constantly disrupts the continuity of the portfolio management and creates seams in the passage of information and corporate knowledge, which consequently draws more effort from the supporting staff. Third, an undesired posting outside of the military environment may inadvertently influence an earlier retirement than the institution desires, or requires. A final concern with CAF officers in ADM(Mat) is that their presence in the ADM(Mat) chain of command creates ambiguity in the responsibilities and accountabilities of each Branch or level 1 organization.

As popularized by Malcolm Gladwell in his book *Outliers*, to be a professional requires ten thousand hours of experience and training.[180] On a full-time basis at 2000 hours per year, that would approximate to five years of full-time employment. For a military officer employed as procurement or engineer support staff in ADM(Mat), that would be separate and in addition to their time serving in a military environment. Based on the RCEME career path outlined in Chapter 3, that would be achieved at the thirteen-year mark or so.[181] Further, their employment in the program management realm would likely be broken up into several two to three-year postings, leading to memory dump/currency invalidation and requiring retraining or re-familiarization. David Perry, the president of the Canadian Global Affairs institute and a leading Canadian procurement expert, suggested that military postings be extended within ADM(Mat) and that they be synchronized with project milestones.[182] The issue would that option is that trained military personnel would spend even less time within their active military careers actually performing *military* tasks. Lastly, one of the biggest problems identified with procurement has been the lack of qualified staff. Project management is such a complex endeavour necessitating continuous training. When CAF members undergo this training, they are either absent from the position within the CAF prior to their posting to ADM(Mat), or they conduct their training while at ADM(Mat), thus creating a vacancy and requiring other staff to cover off their responsibilities.

One of the most significant drawbacks identified by program management staff is the loss of corporate knowledge when a military member is posted away, as reported in the 2021 ADM(Mat) Organizational Assessment conducted by Competency-Based

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[180] Malcolm Gladwell, *Outliers: The Story of Success*, 1st ed., Book, Whole (New York: Little, Brown and Co, 2008).

[181] This assumes at least two postings to ADM(Mat): one as a junior officer, and another as a Maj.

[182] Dave Perry, 'Putting the "Armed" Back into the Canadian Armed Forces: Improving Defence Procurement in Canada', Vimy Paper (Ottawa, ON, CA: CDA Institute, January 2015), 18, https://www.macdonaldlaurier.ca/files/pdf/MLIdefenceprocurement.pdf.

Program Management Organization [183] There are initiatives being led by ADM(Mat) to centralize information management; however, the nuanced experience in interpreting specific SOWs and technical specifications is not easily replaced by reading reports or lessons learned. Thus, when a member is posted away, there is a detailed handover required between the incoming and outgoing individuals. This, however, is insufficient in covering all elements of the project, which then necessitates active engagement of the rest of the project team, thereby taking these members away from their own primary duties, leading to an overall decreased efficiency. Beyond the posting process, military members are also frequently required to undertake professional military education, such as AOC for Capts or the RCEME Advanced Officer Course as outlined in RCEME career path in Chapter 3. These courses take the individual away for six months for the former and one month for the latter, with no guarantee they will be returning to the project once their course is complete. This forced vacancy has a similar effect on the remainder of the project team as would a full posting. In a 1998 Chief Review Service report on *Lessons Learned and Acquisition Management Issues*, ADM(Mat) acknowledged that "continuity of project knowledge has been a long-standing issue.[184] They also acknowledge that "revisions to policy governing the rotation of key project management staff may be required."[185] The importance of consistent and stable acquisition team leadership was also highlighted in Col (retired) Ross Fetterly's doctoral thesis: *Arming Canada: Defence Procurement for the 21st Century*.[186] After a review of the United States, United Kingdom, and Australia's procurement processes, Col (retired) Fetterly presented several "Enduring International Themes," which included the requirement for "clear responsibility and accountability, effective project governance. . ., configure technology to meet military needs, [and] stable acquisition leadership."[187] After 25 years of continued procurement challenges, staff rotations and military postings have yet to be addressed. An impactful first step would be to replace the military members with civilians, thereby eliminating the posting process, rather than having to modify it.

Civilians join the military for an experience unlike no other. Their initial training is quite extensive and completely inculcates them into the military environment and lifestyle. After an initial posting to an operational unit, the engineers are then thrust into a completely foreign environment: bureaucratic Ottawa. Although the change of the day-to-day pace could be welcome for some, the requirement to uproot their families and move to Ottawa is not necessarily desirable for all CAF Engineers and Logisticians. In the same aforementioned CBPMO report, there was some bias against postings to

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[183] Barnes, Mary, 'CBPMO Initiative - Phase 1: Organizational Assessment', n.d., 28.

[184] Dept. of National Defence. Chief Review Services and Canada. Ministère de la défense nationale. Chef - Service d'examen, 'Lessons learned and acquisition management issues: close-out/termination of major Crown projects = Leçons retenues et problèmes de gestion d'acquisition : clôture/résiliation de grands projets de l'état' (Ottawa: Dept. of National Defence, 1998), 11.

[185] Dept. of National Defence. Chief Review Services and Canada. Ministère de la défense nationale. Chef - Service d'examen, 11.

[186] Fetterly and Royal Military College of Canada. Graduate Studies and Research Division, 'Arming Canada: Defence Procurement for the 21st Century', 303.

[187] Ibid.

ADM(Mat) and Ottawa.[188] Further, once their families acclimatize to the Ottawa environment, it is likely to be more difficult to re-post the members and their families elsewhere, leading to higher attrition rates and further exacerbating the staff shortage.[189]

Lastly, ever since unification, there has been debate on the effectiveness of a unified headquarters and holistic DND, with recommendations dating back to 1997 for its reorganization.[190] In a report to the Minister of National Defence at the time, the defence community raised concerns on civilian versus military accountability and operational responsibility.[191] The report further suggested that a split NDHQ would provide civilians with the accountability and responsibility for "strategy and policy formulation," whereas the military component would be responsible for "the implementation of policy, not its formulation."[192] Minister Young dismissed these concerns, however, opting instead to focus on clarifying roles of the DM and CDS as well as senior officials, vice the intricate roles and responsibilities of subordinate organizations and members within these structures.[193] In the procurement context, military and civilians employed within ADM(Mat) introduces ambiguity in responsibilities. As outlined in the responsibilities of the PM, there is an expectation that the PM supports the PD in the development of sustainment requirements. Although the PD is ultimately responsible for the SOR, on behalf of the Commander of the CA, the PM has direct influence on the supportability of the equipment being procured. As the project transitions into Definition and through Implementation, the PM, who works for ADM(Mat) but could be a serving member of the CAF, accepts responsibility for the delivery of the final product. If a military PM accepts deviations to sustainability requirements they defined, it is no longer clear if those decisions were made on behalf of the sponsor or on behalf of the technical authority at ADM(Mat). This issue is avoided by strictly employing civilians within ADM(Mat) and maintaining CAF engineers employed within the requirements staff to define and support the sponsor's perspective.

In summary, military postings to ADM(Mat) have significant drawbacks that meaningfully impact military members and their families, the project management staff and their efficiency, as well as the projects themselves and the secondary impact of project delays on the end user who requires the systems in support of the defence of Canada in accordance with the CAF mandate.

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[188] Barnes, Mary, 'CBPMO Initiative - Phase 1: Organizational Assessment', 29.

[189] CAF Retention Strategy, 69. In the 2019 CAF Retention Survey, 14.7% of respondents indicated posting dissatisfaction as a likely reason to leave the CAF.

[190] Thomas Dimoff, 'The Future of the Canadian Armed Forces: Opinions from the Defence Community', Report to the Prime Minister (Ottawa: Canada, 1997), 14.

[191] Dimoff, 5.

[192] Ibid. 6.

[193] M. Douglas Young and Canada. Department of National Defence, *Report to the Prime Minister on the Leadership and management of the Canadian Forces* (Ottawa: DND, 1997), 30.

Conclusion

This chapter presented and subsequently refuted five arguments for continued CAF engineer employment in ADM(Mat). The *strategic employment* of CAF engineers to fill gaps in civilian engineering staffing was rebutted by the current CAF disposition and shortage of personnel to fulfill primary CAF functions. CAF engineer military experience and the perceived advantage provided to the project team was negated by the presence and engagement from the PD, as an integrated Defence Team member. The argument that CAF engineers are required to define supportability and RAMD requirements was invalidated as all requirements are the responsibility of the Project Sponsor in order to ensure that all elements of the capability being procured are consistent with the concept of employment as conceived by the force development staff. The CAF engineer career progression model was contested through the reiteration of the personnel shortage elsewhere in the CAF while also challenging engineers to compete for positions in common occupation groups. Lastly, the fresh viewpoint provided by newly posted CAF engineers was countered via the presence of a PD, who could also provide that function as they are likely to change positions as frequently as the CAF engineer and whose presence affects all elements of the project.

Subsequently, four additional drawbacks of CAF engineer employment in ADM(Mat) were presented. The CAF engineer posting cycle is paramount to three drawbacks in that it limits the members' ability to truly become professional procurement or engineering support officers, it creates a knowledge vacuum when the member departs, and the forced posting process has been proven to be a cause of increased attrition in the CAF. Further, a mixed structure within an organization creates ambiguity, which challenges responsibilities and accountabilities, thereby placing projects at risk.

Although this chapter has provided ample reasons for the CAF to cease employing engineers in ADM (Mat), this could only be feasible if there was an appropriate solution to backfill all these positions. The next chapter will explore the employment of civil servants in ADM(Mat) and assess if they could effectively fill the void.

CHAPTER 6 – CIVIL SERVANTS

Introduction

Chapter 5 explored the possibility of eliminating all CAF engineer positions within ADM(Mat) and provided ample reasons to do so, not the least of which being that CAF members are required elsewhere to perform their primary role. As part of the joint CDS/DM Reconstitution Directive, Level 1 Commanders and Branch Directors were challenged with trying to find areas in which tasks and responsibilities could be handed over to civilians or contractors.[194] Thus, the purpose of this chapter is to support that effort by first identifying the advantages of civil servants over military members. An analysis of the risks and drawbacks of relying solely on civil servants in ADM(Mat) will follow along with mitigation strategies.

ADM(Mat) Civilians Solution

A United States Business Executives for National Security paper from 2009, found that Personnel was one of three key shortcomings of the United States military acquisition process.[195] Specifically, they argued "[t]he acquisition process, unlike most government pursuits, is a business function. It demands skills and talents that are far more common to the business world than to government and military operations."[196] Civilians in DND are positioned to bridge that gap between business and military operations. Their advantages to the institution are plentiful. They include quicker qualification timelines to perform the same function and the ability to be hired directly at various levels of the organization. More specifically as related to procurement and acquisition, replacing CAF engineers with civil servants permits the broadening of the recruitment pool, including recent university graduates, civilian deployments from another government departments, civilian contractors to perform specific duties, and even retired CAF engineers. Fundamentally, all the disadvantages of employing a military member in a project management position in ADM(Mat) are countered by simply replacing them with a civil servant. On the surface, this seems ideal, though too simplistic to the skeptic – and to the individuals who benefit from the status quo. The ability to professionalize in a concerted manner, the possibility to maintain structural project continuity and to retain corporate knowledge, and the appeal of being employed in a position for which the member applied are all possible with civil servants vice CAF members. As with any substantial organizational change, there are some drawbacks, such as a complex personnel management process; however, holistically, the CAF to civil servant swap appears to be an obvious choice.

Recruitment has proven to be a great challenge for both the CAF and ADM(Mat). Despite the difficulties experienced in both organizations, as demonstrated in Chapter 3, the CAF requires significantly more time to train an officer to be ready for employment

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[194] CAF Reconstitution Directive, 24.

[195] Business Executives for National Security, *Getting to Best: Reforming the Defense Acquisition Enterprise* (Washington: Business Executives for National Security, 2009), 7.

[196] Business Executives for National Security, 7.

at ADM(Mat), from the initial stage of recruitment to functional Systems Engineering. ADM(Mat) could recruit from any part of society to fulfill the responsibilities of their engineers at any level. If scarcity in qualified civilians exist, it would still only require three years to train a Systems Engineer through the proven Engineer-in-Training (EIT) program.[197] This particular initiative hires a brand-new engineering graduate as an ENG-02.[198] Over the next two years, they conduct a series of on-the-job-training opportunities and associated exams to finally graduate from the program as ENG-04 and a fully independent member of the project team.[199] The other advantage is that ADM(Mat), as a civilian organization, has access to an external hiring pool from which they can employ personnel at any level in their organizational hierarchy, pending the applicant holds the appropriate qualifications and relevant experience. The military is a closed structure in which one can only be promoted through a hierarchical rank structure.[200]

Perhaps the greatest advantage of hiring civilians is that there is near unlimited flexibility in hiring as long as the staffing requirements are met. If an applicant has the requisite knowledge and experience then they can be hired through the interview process. Unlike the CAF, there is no age limitation, there is no fitness standard, and there are no necessary geographic deployability standards to maintain: the only elements that matter are the individual's knowledge, communication skills, and general competence. The possibilities are endless. For example, a recently retired military personnel with operational experience with legacy equipment could be employed on a project team to replace that equipment and provide insight to the rest of the project team. ADM(Mat) could even standardize the job description for certain key positions and ensure the applicants have the requisite military experience, without necessitating an active service CAF member.

Canada has long had issues with its procurement policy and the consistent solution is to professionalize DND procurement staff. In SSE, the Government of Canada through initiative 98, dedicated financial resources and authorized the growth and further professionalization of procurement staff.[201] Many efforts have been undertaken to do so, even the creation of the CBPMO, which seeks to support project managers and their staff in the fulfilment of their duties. The advantage of civilians in this regard is that they have time to dedicate themselves to conduct all required training, apply the skills regularly, and continue to increase their aptitude through training at a higher level. One such example of progressive training opportunities is the Project Management Competency Development (PMCD) programme. The programme consists of three levels, each having particular requirements "in terms of work, experience, training and education, indicators

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[197] Canada, 'Materiel Acquisition and Support Officer Development Program - Canada.Ca', Canada.ca, accessed 7 May 2023, https://www.canada.ca/en/department-national-defence/corporate/job-opportunities/civilian-jobs/civilian-job-opportunities/students-and-new-grads/materiel-acquisition-support-officer-development-program.html.

[198] Canada.

[199] Canada.

[200] In the current recruitment process, a civilian cannot join the CAF as a RCEME Maj. They must join as an officer cadet and undergo the required training and gain the requisite experience for promotion.

[201] Canada. Department of National Defence, *Strong Secure Engaged*, 75.

of performance, and leadership capacity."[202] Level one is experience and course-based, whereas levels two and three require a simulation exercise culminating with a 25-minute presentation to either a Director (for level 2) or Director-General (for level 3).[203] Although this training and simulation testing is available to both military and civilians, as Maj Whalen highlighted in his paper "Capital Defence Procurement: Training Is Not The Problem", the experience requirements are a barrier to military personnel as they may not have the three years in an eligible position.[204] Further, there has been a significant investment in additional training for ADM(Mat) staff, with 200 personnel gaining the Certificate in Procurement and Project Leadership and another 36 gaining a Masters in Complex Project Leadership over eleven months from the Telfer Business School in Ottawa.[205] This training is a significant part of the solution; maintaining the personnel with the training is a separate challenge.

Investment in training provides tremendous value to an institution. It breeds confidence and productivity in staff and galvanizes the co-beneficial employer-employee relationship. This investment, however, needs to be harnessed and optimized for continuous return. To do so, the organization needs to ensure that those with the required training are employed in a manner to best utilize this knowledge and skill for the overall benefit of the organization. Investing in a year-long program with but a two or three-year organizational commitment afforded by the military posting process may not provide the value sought. Having this training cost amortized over a longer commitment period would provide much greater return on investment. Although civilians are not forcibly posted every two-to-three years, there is still an expectation for mobility with ADM(Mat) and the greater public service team. In fact, a 1986 study on United States University Administrations found that a healthy mix of new leadership and mixed degrees of staff continuity were beneficial to institutional effectiveness.[206] There is always a risk that public servants may seek alternative employment at any time; however, this is a leadership and management responsibility to ensure their staff are properly supported and talent-managed appropriately within the public service personnel management system processes. What must be taken into consideration in this case is that public servants can choose to deploy to another position if there is reason to leave. For example, if there is a higher-level opportunity elsewhere, public servants can compete for the new job. The advantage in this case, conversely to military personnel, is that the competition for civilian positions necessitates the greatest qualifications amongst applicants. Military

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[202] 'Project Management Competency Development Programme', Assistant Deputy Minister Materiel, accessed 8 May 2023, materiel.mil.ca/MAT_Intranet/business-functions-project-management/project-management-competency-development-programme.page.

[203] 'DND Project Manager Qualification', Assistant Deputy Minister Materiel, accessed 8 May 2023, materiel.mil.ca/MAT_Intranet/business-functions-project-management/project-management-competency-development-programme.page.

[204] Major Paul P Whalen, 'Capital Defence Procurement: Training Is Not the Problem' (Canadian Forces College, 2021), 13.

[205] MGen Derek Basinger to Dr. Craig Stone, 'Telfer Quals', 19 January 2023; 'Complex Project Leadership - Telfer School of Management', accessed 21 March 2023, https://telfer.uottawa.ca/en/programs/complex-project-leadership/.

[206] Gagnon, 'An Examination of the Assumptions Behind Attempts to "Civilianize" DOD Acquisition Process'. 95

postings focus primarily on the need to fill positions with personnel with adequate qualifications and relevant experience, though by no means an expert in the role. In the case where a civilian does deploy outside of a project team, the void would be similar to that left by a military member. The difference, however, is that the public servant will most likely continue to contribute to the greater project management team, leveraging the experiences gained from the project work.

As public servant hiring is competitive, applicants are generally motivated to get the employment. The nature of the job may not be 100% clear at the time of their application, as it rarely ever is until someone works through the day-to-day process, but they understand the environment within which they are expected to perform, which is contrary to military members exposed to ADM(Mat) for the first time. Further, since public servants apply for their position, they inherently understand the location of their employment and have the ability to negotiate the working conditions as required. This process greatly reduces the risk of job dissatisfaction from a posting perspective.

In order to optimize the professionalism of the project management and procurement staff, ADM(Mat) needs to civilianize all functional positions. Having an organizational structure built for consistency and continuity breeds efficiency. The institutional benefits include a quicker implementation plan which sees civilians become public servants within nine months and contributing immediately vice CAF members who have to progress through a rigid rank structure.[207] Lastly, ADM(Mat) can recruit from the whole of society, without discriminating against physical abilities or age, which opens the possibility for retired CAF members to join the civil service.

Civilian Drawbacks

Although civilianizing all ADM(Mat) functional positions could provide great benefit to the institution, there have been significant reservations from the military community on the impacts of civilianization. The most common argument against the civilianization of defence is the fear that military advice will be lost through the overwhelming presence of civil servants and their "consensus-based policy."[208] Three other drawbacks or limitations would need to be overcome and/or mitigated. The first is that civil servants are not subject to the National Defence Act (NDA) and the CAF Code of Service Discipline. This could limit ADM(Mat)'s ability to mandate specific actions or workloads. The second builds upon the first; it is the impact of a large and vocal labour union that serves to protect all members. There is a risk, however, that the union's priorities could conflict with national interests. The third differentiator is that, unlike military members, civil servants are not bound by a contract and can quit anytime. Although these main differentiators between military and civilians could be cause for

[207] Department of National Defence. Assistant Deputy Minister (Review Services), 'Evaluation of Defence Civilian Human Resources Management Staffing' (Ottawa: DND, June 2016), 22.

[208] J. L. Granatstein et al., *For efficient and effective military forces*, Book, Whole (Ottawa: Dept. of National Defence, 1997), 6.

concern, each one of them can be mitigated through various degrees of policy adaptations or shifting of certain responsibilities.

In a paper for the Minister of National Defence, Canadian historian and retired military member J.L. Granatstein argues for the separation of the military and civilian components of NDHQ, with "policy and communications, materiel, civilian personnel, and finance and audit" should be under the DM with the remainder falling under the CDS.[209] He suggests that this would enable better accountability for decision-making and counter the narrative at the time that a civilianized NDHQ causes military advice to matter very little."[210] He goes on to argue that this would not prevent military members from being employed within DM organizations, nor civilians from being employed under the CDS, and he explicitly states that military personnel would be essential within the Materiel group, though he fails to explain why.[211] The structure proposed was enacted for the most part with the advent of Strategic Joint Staff during the General Hillier era; however, the argument for military members' presence in the Materiel Group is not addressed, though assumedly his concerns align with the arguments presented in

Chapter 5. Following a public service career of over 33 years,[212] ex-ADM(Mat) Alan Williams published *Reinventing Canadian Defence Procurement: A View from the Inside*, in which he argues for an independent Defence Procurement Canada.[213] He also argues that since many ADM(Mat) have prior military service, there is a tendency for ADM(Mat) to be "deferential to the leaders of the military", therefore calling for ADM(Mat) to be explicitly civilian without prior service.[214] The argument of a biased view may be overstated; however, it provides additional consideration for the importance of the civilian *challenge* function and the risk that it erodes based on the organizational structure.

The NDA and Code of Service Discipline provide the legal framework that permits the CAF chain of command to compel subordinates to obey lawful orders, up to and including advancing in the line of fire.[215] From an institution perspective, these legal documents provide the framework that permits the active management of military members' careers including their postings. If a member was to refuse a posting, they could be in breach of section 83 of the NDA, which is to disobey a lawful command.[216] It is through this mechanism that the CAF can move military personnel quickly to fill essential positions within ADM(Mat). This coercive tool does not exist with public servants. In order to move a public servant from one position to another, management must incentivize the move, and the challenge is that there are little incentives available to

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[209] Granatstein et al., 6.
[210] Ibid. 7.
[211] Ibid. 6.
[212] 'Alan Williams | David Pratt & Associates', David Pratt and Associates, accessed 15 June 2023, https://dpa.ltd/alan-williams/.
[213] Williams, *Reinventing Canadian Defence Procurement: A View from the Inside*.
[214] Williams, 88.
[215] 'NDA', 68.
[216] 'NDA', 58.

middle management at ADM(Mat). At the end of the day, it is up to the individual managers within ADM(Mat) to use their soft skills to motivate their staff to deploy into a different position under the members' own volition. This last part is critical, as otherwise the labour unions would be quick to object, which leads to the second differentiator between military and civil servants: labour unions.

It is paramount that any adjustments to the work setting, work descriptions and expectations, or expected work hours, be actively communicated to all public servants and to their union representatives. This is not inherently an issue; however, it does require more consideration than typically expected for military members. This should have a negligible impact on project outcomes.

The last differentiator is the lack of a binding contract between public servants and the Government of Canada. Public servants are free to pursue any opportunity that suits them at any given time. This is a risk to projects, considering the alternative is military personnel who are actively managed by the CAF. The nuance is that civil servants "may" leave at any time, whereas CF member "will" leave after two to three years. The former cannot necessarily be planned for by the project team, whereas the latter will definitively cause a disruption in the organization on a cyclical basis. Neither solution is ideal; however, with proper mentorship, oversight, and support, public servants should be less likely to move on from a position unless it is to pursue a greater and more challenging opportunity, which should be foreseen and planned. Another solution is through active career management, which has proven to contribute greatly to employee job satisfaction and retention.[217] In fact, a DND Civilian Pilot Exit Survey conducted by Defence and Research Development Canada (DRDC) through the Director General Military Personnel Research and Analysis (DGMPRA) reported that "aspects related to their career mobility and opportunities for advancement were areas of concern.[218] Using DGLEPM as an example, of the nine directors, four are occupied by military members, thereby restricting advancement opportunities for civilians by 44%.[219]

The solution to mitigate each one of these differentiators or risks is active engagement by management. If the project managers and directors are directly engaged and supportive of their personnel, they will be more likely to continue to support the organization in any way possible. In their Reconstitution Directive, the CDS and DM acknowledged that both military and public servants need to continue to be supported,

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[217] Ingrid L. Potgieter, Melinde Coetzee, and Nadia Ferreira, 'The Role of Career Concerns and Workplace Friendship in the Job Embeddedness–Retention Practices Satisfaction Link', *SA Journal of Industrial Psychology* 44 (30 April 2018), https://doi.org/10.4102/sajip.v44i0.1519.

[218] Department of National Defence. DGMPRA., 'Department of National Defence Civilian Exit Survey: Pilot Study Findings', Exit Survey, n.d., http://cmp-cpm.mil.ca/assets/CMP_Intranet/docs/en/support/dgmpra/dgmpra_pub_civilian_exit_survey.pdf.

[219] Department of National Defence., 'Military Command Software Establishment'. The four military director positions in DGLPEM are Director Armoured Vehicle Project Management, Director Land Communications Systems Program Management, Director Land Equipment Program Staff, and Director Armament Sustainment Program Management. The author acknowledges that these positions present opportunities for RCEME and SIGS officer progression; however, as argued in Chapter 3, there are ample vacancies throughout the CAF that could be filled by either RCEME and SIGS as a specialty or as a GSO.

reemphasizing initiatives such as “flexible work arrangements” and “new possibilities for remote work”.[220] This is a positive step and continued focus on the matter will mitigate the risks of mass public servant exodus from ADM(Mat).

Conclusion

This chapter explored the possibility of replacing all CAF engineers in ADM(Mat) with civil servants. Several convincing arguments were presented, including reduced recruitment and training times, the ability to employ new hires at any level of the institution, and the flexibility to draw from a limitless talent pool. In addition, by virtue of a more static employment model, civil servants can be provided the time and requisite training to actually become professional engineers and acquisition experts. Further, they can maintain continuity in the project teams, and, since civilians select their employment, they are more likely to appreciate their position.

Several potential drawbacks were also highlighted, such as the inability of management to enforce particular working conditions to expedite a process in the same manner they could with a military member. There is also a risk that civil servants may opt to frequently change their employment as they are not beholden to a military service contract.

Overall, there are residual risks with a change of this magnitude; however, removing CAF members from ADM(Mat) empowers the organization to backfill the positions in the most efficient manner possible. There will evidently be challenges with hiring sufficient personnel and getting them qualified in a timely fashion, but the alternative of maintaining the service shortage in the CAF is no longer an option.

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[220] Canada. Department of National Defence, *CAF Reconstitution Directive*.

CHAPTER 7 – FINAL CONCLUSION AND RECOMMENDATIONS

The goal of this paper was to support the CAF Reconstitution effort and present an option to divest some CAF responsibilities with a view to consolidating military members so they can be reallocated to fulfill more pressing, critical, and core military responsibilities. Chapter 2 outlined the severity of the problem, with a CAF shortage of over 10,000 personnel. Focusing on administrative functions, ADM(Mat) was selected as a target to investigate due to the size of the institution and the percentage of military representation within it at approximately 25%. In order to focus the analysis, CAF engineering officer occupations were analysed, which resulted in a potential recapitalization of 806 positions, which would be sufficient to address all personnel shortages within the engineering occupations, and there would still be 377 additional officers available to backfill other positions. Although, the quantity of CAF officers within ADM(Mat) represents less than 10% of the total personnel shortage, if this strategy were to be extrapolated across all ADMs, the CAF could reduce their overall personnel demand, and thus decrease the personnel shortage.

Chapter 3 presented the officer career path, using the RCEME Officer development program to expose the intricacies of the CAF training system and highlight the total training time invested in each officer. This analysis revealed a total military-specific training time of 114 weeks to progress from OCdt to LCol. This amounts to over two full years of training, which is a significant investment to ensure CAF members are prepared to execute their military tasks.

With the military career progression model foundation set, Chapter 4 changed course and explored the evolution of procurement in Canada, the force development system, as well as the project approval process. The key observation was that civilian oversight and management of the CAF grew significantly over the last century. And in order to ensure the CAF is ready with the capabilities required for whatever the future may bring, DND needs to embrace their role within the government framework and work with our civilian counterparts to conceive, design, build, and manage a successful CAF for tomorrow. As responsibilities of the PD were compared to those of the PM, the distinct expectations for CAF experience was highlighted. The application of professional military judgement was deemed essential in the force development realm as well as in requirements definition; however, the requirement of this experience was not as apparent for the PM role.

With a deeper analysis of the roles and responsibilities of CAF engineers in ADM(Mat) as well as the challenges and limitations of their employment, Chapter 5 revealed that CAF engineers may be better served operating under the CAF umbrella. This solution would only be feasible if there was an appropriate replacement for these engineers, which was investigated in Chapter 6.

Despite some current challenges facing ADM(Mat) in staff hiring, opening up all positions within the organization to civil servants would provide tremendous flexibility in determining optimize path forward. With a multitude of options for hiring from across

society, ADM(Mat) is in a much better position to fill its internal capability gap then the CAF otherwise would be.

Due to the limited scope of this paper, several elements of the ADM(Mat) dynamic could not be investigated to the fullest extent. In particular, a more detailed analysis of the CAF engineers in life-cycle or weapon systems management roles could be conducted. Further, the employment of NCMs in ADM(Mat) should be analysed, as removing officers from the organization would eliminate their military leadership cadre. Lastly, if CAF engineers were to be reallocated from ADM(Mat), their optimal employment would need to be analysed further, with a particular focus on augmenting the force development and requirements definition organizations with engineers.

Recommendations

Recommendation 1: All Level 1 Commanders and Branch Directors within the Deputy Minister's responsibilities should conduct a detailed review of *all* military positions in their respective organizations, carefully analysing the criticality of military *experience* for each specific position. For positions assessed as requiring military experience, Level 1 Commanders and Branch Directors must then determine the currency requirement of that experience (i.e. could a retired member provide that experience, or do they need to still be serving members). The results of these assessments would then be annotated on formal work descriptions and terms of reference for each position. The list of potential positions to be recapitalized by the CAF would then be reviewed by Chief Military Personnel/Director General Military Personnel Strategic in conjunction with Chief of Programme/Director Defence Force Planning and Strategic Joint Staff/Director General – Strategies Effects and Readiness. The intent would be to reconcile future CAF requirements while ensuring that Force Posture and Readiness in support of Strong Secure Engaged and the upcoming Defence Policy Update is achievable as early as possible.

Recommendation 2: CAF engineer and logistics trades must be included in capability development and requirements staff. Professional military judgement is essential in the early stages of a project, and the establishment of operational requirements that are grounded with the realities of maintenance and logistics support are far more likely to be successful. Having CAF engineers and logisticians in the process early allows for immediate and direct engagement throughout the Project Sponsor chain of command, leading to quicker decision-making. Some augmentation to the capability development and requirements staffs will be required simultaneous to the transition out of ADM(Mat) to ensure the appropriate level of sustainment and maintenance requirements oversight.

Recommendation 3: CAF Engineers and Logisticians should be considered for all senior command positions within the organization, at an equal footing with their Special Forces Operator, Combat Arms, Naval Warfare, and Pilot counterparts. Diversity in background and experience is likely to provide diversity of thought at senior levels, which may permeate positively throughout the ranks. Further, eliminating opportunities for CAF Engineers and Logisticians within ADM(Mat) and potentially other ADMs will present an even greater pool of highly qualified senior leaders within the CAF writ large.

Recommendation 4: Changes to the ADM(Mat) structure are recommended immediately within the Major Project Delivery organization, since they do not have the responsibility of life-cycle management. Gradually, civilian staff may then be hired to backfill all positions vacated by military personnel.

APPENDIX 1 – CAF POSITION SHORTAGES RELATIVE TO ADM(MAT)

Table A1.1 – Sub-Lieutenant to Lieutenant (Navy) / Lieutenant to Captain residual staffing deltas

Trade	Lt(N)-SLt/Capt-Lt		
	ADM(Mat)	**CAF Shortage**	**Delta (Overage)**
Aerospace Engineer (AERE)	180	62	(118)
Communications Electronics Engineer (CELE)	21	30	9
Royal Canadian Electrical Mechanical Engineer (RCEME)	48	12	(36)
Logistics (LOG)	40	-3	(43)
Marine Systems Engineer (MS ENG)	41	38	(3)
Naval Engineer (NAV ENG)	N/A	N/A	
Naval Combat Systems Engineer (NCS ENG)	61	22	(39)
Signals Officer (SIGS)	30	35	5
			(225)

Table A1.2 – Lieutenant-Commander / Major residual staffing deltas

Trade	LCdr/Maj		
	ADM(Mat)	**CAF Shortage**	**Delta (Overage)**
Aerospace Engineer (AERE)	87	24	(63)
Communications Electronics Engineer (CELE)	12	15	3
Royal Canadian Electrical Mechanical Engineer (RCEME)	56	24	(32)
Logistics (LOG)	25	73	48
Marine Systems Engineer (MS ENG)	47	19	(28)
Naval Engineer (NAV ENG)	N/A	N/A	
Naval Combat Systems Engineer (NCS ENG)	38	21	(17)
Signals Officer (SIGS)	16	40	24
			(65)

Table A1.3 – Commander / Lieutenant-Colonel residual staffing deltas

Trade	**Cdr/LCol**		
	ADM(Mat)	**CAF Shortage**	**Delta (Overage)**
Aerospace Engineer (AERE)	23	11	(12)
Communications Electronics Engineer (CELE)	3	0	(3)

Royal Canadian Electrical Mechanical Engineer (RCEME)	19	1	(18)
Logistics (LOG)	13	5	(8)
Marine Systems Engineer (MS ENG)	N/A	-1	
Naval Engineer (NAV ENG)	24	1	(23)
Naval Combat Systems Engineer (NCS ENG)	N/A	N/A	
Signals Officer (SIGS)	3	5	2
			(62)

Table A1.4 – Captain (Navy) / Colonel and above residual staffing deltas

Trade	Capt(N)+/Col+		
	ADM(Mat)	**CAF Shortage**	**Delta (Overage)**
Aerospace Engineer (AERE)	5	-2	(7)
Communications Electronics Engineer (CELE)	1	-2	(3)
Royal Canadian Electrical Mechanical Engineer (RCEME)	5	0	(5)
Logistics (LOG)	2	0	(2)
Marine Systems Engineer (MS ENG)	N/A	N/A	
Naval Engineer (NAV ENG)*	7	1	(6)
Naval Combat Systems Engineer (NCS ENG)	N/A	N/A	
Signals Officer (SIGS)	1	-1	(2)
			(25)

Source: Department of National Defence, DGMPRA Establishment Status Report effective November 2022

APPENDIX 2 – EVOLUTION OF PROCUREMENT IN CANADA TABLE

Year	Federal Organization	Remarks	Environment/Group Organizations	Precipice for Change	Commission or Study
Pre-1914	Shell Committee	Shell Committee was a civilian organization operating at the national level to supply Britain	Department of Militia and Defence (CA) Department of Naval Service (RCN)	Defence product price discrepancies between services	Royal Commission on War Supplies (1915)[221]
1915	War Purchasing Commission; and Imperial Munitions Board	Two independent departments, with the latter reporting directly to Britain	CA, RCN, Air Corps	End of the War	
1919	Nil	No federal department oversight on Defence Procurement.	Department of Militia and Defence (CA) Department of Naval Service (RCN) Air Board (RCAF)	Cost-effectiveness	*National Defence Act* (1923)
1923	National Defence Headquarters	Amalgamation of administration and policy arms of the military services. Procurement processes remained at Services level.	CA, RCN, Air Corps	Allegations of corruption	Royal Commission on the Bren Machine Gun Contract (1938) *Defence Purchases, Profits Control and Financing Act*
1939	Defence Purchasing Board (*reporting to*		CA, RCN, RCAF (1924)	Second World War	*Department of Munitions and Supply Act*

[221] Auger, 'The Evolution of Defence Procurement: A Hundred-Year History'. 1

Year	Federal Organization	Remarks	Environment/Group Organizations	Precipice for Change	Commission or Study
	Minister of Finance)				
1939	War Supply Board (*reporting to Minister of Finance* then to *Transport*)		CA, RCN, RCAF		Order in Council
1940	Department of Munitions and Supply		CA, RCN, RCAF	End of Second World War	*Department of Reconstruction and Supply Act*
1945	Department of Reconstruction and Supply	Merger of Department of Munitions and Supply with the Department of Reconstruction		Reductions in defence spending in post-war era	
1948	Industrial Defence Board (IDB), and Canadian Commercial Corporation	Previous department was de-centralized: production with IDB and procurement with CCC, which reported to the Department of Trade and Commerce		Creation of NATO and the Korean War	*Defence Supplies Act*
1950	Department of Trade and Commerce	Minister of Trade and Commerce was granted the powers of Defence procurement, vice their subordinated CCC.		Intensification of the Korean War	*Defence Production Act*
1951	Department of Defence Production (DDP)	Essentially the re-establishment of the Department of Munitions and Supply under a different name. The CCC remained in place but reported to the DDP.		Desire for increased government efficiency	Glassco Commission, *Canadian Forces Reorganization Act*

Year	Federal Organization	Remarks	Environment/Group Organizations	Precipice for Change	Commission or Study
1964	Department of National Defence		CAF Unification into a Canadian Forces Headquarters	Implementation of Glassco Commission recommendations	
1968	Department of Supply and Services (DSS)	Renamed from the DDP as it absorbed other department responsibilities		Implementation of Glassco Commission recommendations	
1972	NDHQ	Amalgamation of Civilian DND and military CFHQ	ADM(Mat)	Economic development	
1986	PSPC, ISED	Industry Canada included in procurement to ensure 100% of investment returned to Canada			

Source: Auger, 'The Evolution of Defence Procurement: A Hundred-Year History'

APPENDIX 3 – RCEME POSITIONS BY WORK ENVIRONMENT

Serial	Job Title	Rank	Path	Workplace
1	Engineer 202 Workshop Depot (Engr 202 WD)	Lt-Capt	Institutional	Office
2	Platoon Commander (Pl Comd)	Lt-Capt	Operational	Field
3	Sub-Unit Administrative Officer (Sub-Unit AO)	Lt-Capt	Operational	Field
4	Training Platoon Commander (Trg Pl Comd)	Lt-Capt	Operational/ Institutional	Field
5	A4 Electrical and Mechanical Engineering 2 (A4 EME 2)	Lt-Capt	Institutional	Office
6	Ammunition Engineering Officer (Ammo Engr O)	Lt-Capt	Institutional	Office
7	Land Equipment Management System Integrated Logistics Support Officer (LEMS ILS O)	Lt-Capt	Program Management	Office
8	Land Equipment Management System Life Cycle Materiel Manager (LEMS LCMM)	Lt-Capt	Program Management	Office
9	Land Equipment Management System Project Control Officer-Equipment Management Team Coordinator (LEMS PCO-EMT Coord)	Lt-Capt	Program Management	Office
10	Land Equipment Management System Staff Officer (LEMS SO)	Lt-Capt	Program Management	Field*
11	Land Equipment Management System Systems Engineer (LEMS Sys Engr)	Lt-Capt	Program Management	Office
12	Maintenance Officer (Minor Static Workshop) (Maint O (Minor Static Wksp))	Lt-Capt	Operational/ Institutional	Office
13	Unit Maintenance Officer (Unit Maint O)	Lt-Capt	Operational	Field
14	Electrical and Mechanical Workshop Second-in-Command (EME Wksp 2IC)	Lt-Capt	Operational	Field
15	G4 Maintenance (G4 Maint)	Lt-Capt	Operational	Field

16	Observer Controller Maintenance (OCT Maint)	Lt-Capt	Operational/ Institutional	Field
17	School Adjutant (School Adjt)	Lt-Capt	Operational/ Institutional	Office*
18	Instructor (Instr)	Lt-Capt	Operational/ Institutional	Field
19	School Operations Officer (School Ops O)	Lt-Capt	Operational/ Institutional	Office*
20	Standards Officer (Stds O)	Lt-Capt	Operational/ Institutional	Field
21	Training Company Second-in-Command (Trg Coy 2IC)	Lt-Capt	Operational/ Institutional	Field
22	Training Staff Officer (Trg SO)	Lt-Capt	Operational/ Institutional	Office*
23	Corps Adjutant (Corps Adjt)	Lt-Capt	Institutional	Office
24	G4 Maintenance Senior Staff Officer (G4 Maint SSO)	Maj	Operational	Field
25	Land Equipment Management System Deputy Project Manager (LEMS Dep PM)	Maj	Program Management	Office
26	Land Equipment Management System Equipment Management Team Leader (LEMS EMT Leader)	Maj	Program Management	Office
27	Land Equipment Management System Integrated Logistics Support Manager (LEMS ILS Mgr)	Maj	Program Management	Office
28	Land Equipment Management System Senior Integrated Logistics Support Officer (LEMS Sr ILS O)	Maj	Program Management	Office
29	Land Equipment Management System Senior Staff Officer (LEMS SSO)	Maj	Program Management	Field*

30	Land Equipment Management System Senior Systems Engineer (LEMS Sr Sys Engr)	Maj	Program Management	Office
31	Officer Commanding Maintenance Company (OC Maint Coy)	Maj	Operational	Field
32	Officer Commanding Training Company (OC Trg Coy)	Maj	Operational/ Institutional	Field
33	Senior Ammunition Engineering Officer (Sr Ammo Eng O)	Maj	Institutional	Office
34	A4 Electrical and Mechanical Engineering (A4 EME)	Maj	Institutional	Office
35	Executive Assistant to Director General Land Equipment Program Management (EA DGLEPM)	Maj	Institutional	Office
36	Land Equipment Management System Advisor (LEMS Advr)	Maj	Program Management	Office
37	Land Equipment Management System Liaison Officer (LEMS LO)	Maj	Program Management	Office
38	Land Equipment Management System Project Manager Minor Projects (LEMS PM Minor Proj)	Maj	Program Management	Office
39	Career Manager (CM)	Maj	Institutional	Office
40	School Chief Instructor (School CI)	Maj	Operational/ Institutional	Field
41	School Deputy Commanding Officer (School DCO)	Maj	Operational/ Institutional	Office*
42	Deputy Commanding Officer 202 Workshop Depot (DCO 202 WD)	LCol	Institutional	Office
43	Land Equipment Management System Integrated Logistics Support Manager Major Projects (LEMS ILS Mgr Maj Proj)	LCol	Program Management	Office
44	Land Equipment Management System Project Manager Major Projects (LEMS PM Maj Proj)	LCol	Program Management	Office

45	Land Equipment Management System Section Head (LEMS Sect Hd)	LCol	Program Management	Office
46	Land Equipment Management System Systems Engineering Manager Major Projects (LEMS Sys Engr Mgr Maj Proj)	LCol	Program Management	Office
47	Military Program Advisor Defence Research and Development Centre (Mil Pgm Advr DRDC)	LCol	Institutional	Office
48	School Commanding Officer (School CO)	LCol	Operational/ Institutional	Office*
49	Land Equipment Management System Senior Advisor (LEMS Sr Advr)	LCol	Program Management	Office
50	Commanding Officer 202 Workshop Depot (CO 202 WD)	Col	Institutional	Office
51	Director Force Development (DFD)	Col	Institutional	Office
52	Land Equipment Management System Director (LEMS Dir)	Col	Program Management	Office
53	Land Equipment Management System Senior Project Manager (LEMS Sr PM)	Col	Program Management	Office
54	Director Land Equipment Program Support (DLEPS)	Col	Program Management	Office

Source: The Canadian Armed Forces Military Employment Structures Manual, Volume 2 - Occupational Specifications, Part 1 - Officer Occupations, Occupation - Electrical and Mechanical Engineering (EME MOS ID 00187

APPENDIX 4 – PROJECT MANAGEMENT POSITIONS AND RESPONSIBILITIES

The Project Approval Directive articulates the responsibilities of each member of the project team in intricate detail. The purpose of this appendix is to provide an overview of these responsibilities while highlighting the elements which may necessitate military experience.

Position	Phase	Serial	Responsibility
Project Director	General	1	The Project Director (PD) is the functional authority for the operational requirement and leads the effort to identify and obtain approval for the preferred option to satisfy the operational requirement. The Project Director (PD) acts on behalf of the Project Sponsor's organization.
	Responsibilities	2	− Represent and report through the normal Chain of Command to the Group Principal of the sponsoring organization;
		3	− Acting as the functional authority for operational requirements and as the link between the Project Organization and the user organizations;
		4	− Overall guidance and coordination of project activities on behalf of the Project Sponsor, including the preparation and staffing of the documents necessary to obtain Departmental Approval and resource allocation;
		5	− Coordinate Project/Program activities, when delegated, including the preparation and staffing of program decision documents; and
		6	− Retain functional authority for the Statement of Operational Requirements (SOR) and approve operational and cost/capability trade-off decisions subject to the approval and direction of the functional authority and Chain of Command on operational priorities; and
		7	− Maintenance of the Defence Services Program Portal (DSPP)/ Defence Resource Management Information System (DRMIS) data until Project Approval for Definition (PA (Def)).
		8	− Plan and schedule activities in support of Project/Program objectives within the National Defence Headquarters (NDHQ) functional matrix;
		9	− Represent the Senior Review Board (SRB) Chairperson or functional superior as appropriate in working level discussions, negotiations, etc. during the sponsor leadership period;

Position	Phase	Serial	Responsibility
		10	− Arrange for the preparation and approval of decision documents and their supporting documentation as required, including Statement of Operational Requirements (SOR), Strategic Context Document (SCD), Business Case Analysis (BCA), Project Complexity and Risk Assessment (PCRA), Project Approval (PA) for Definition (PA(Def)), Project Approval (PA) for Implementation (PA(Imp)) and Project Closeout Report (PCR). As part of project documentation review, ensure that the Gender-Based Analysis Plus (GBA+) and Strategic Environmental Assessment (SEA) is conducted and integrated into project documentation;
		11	− Prepare or assist in the preparation of other Government documentation (e.g. Memoranda to Cabinet, Project Brief, Treasury Board Submission, Treasury Board Progress Reports, Interdepartmental Memoranda of Understanding (MOU) as directed by the appropriate Project/Program committee or the Project Leader; and
		12	− Prepare and submit intra/inter-departmental Project/Program status/progress reports as required during the sponsor leadership period.
	Identification and Options Analysis	13	− In conjunction with the Project Manager, determine the total personnel resources required to carry out the Identification (ID), Option Analysis (OA), and Definition Phases of the Project/Program, and also specify those personnel resources (positions/person years) that cannot be provided by the sponsoring organization;
		14	− Conduct, have conducted, or draw from, relevant studies and analyses, to define and support project related statements of the threat, the mission, the operational deficiencies, Force Development, the options, the concept of operations, the operational requirements, and their compatibility with departmental policy, Capability Based Planning, etc.;
		15	− Ensure that, in general, any planned request for resources is based directly or indirectly on a valid requirement (or in the case of R&D, is directed toward established departmental objectives); and, more specifically, that any relevant Business Case Analysis (BCA) and Statement of Operational Requirements (SOR) are accurate reflections of the operational deficiency and the resultant capability that is to be achieved or maintained;
		16	− Provide direction as appropriate to project officers regarding the character and extent of the assigned activities during the sponsor leadership period, particularly the conduct of Development Studies;
		17	− Ensure that members of the matrix Project Team prepare and provide relevant studies and analyses, as appropriate, that define and support Project/Program related statements of the technical options, specifications, costs, Implementation schedule, development activity, tests and evaluation, personnel ramifications, training, logistic and maintenance support; ensure their compatibility with departmental policy and the approved operational requirements that are to be satisfied. This may include the supervision of funded contracts during the sponsor leadership period;

Position	Phase	Serial	Responsibility
		18	− Monitor the trade-off analysis of each option affecting schedule, cost and performance objectives, which is conducted during the Option Analysis Phase, and consult the Functional Authority for direction on priorities for the selection the preferred option which best meets the operational requirements within Project/Program constraints; and
		19	− Refine and re-validate the Draft Statement of Operational Requirement (SOR) and obtain endorsement prior to commencing the Definition Phase
	Definition	20	− Make or seek approval on decisions which affect achievement of time, cost and performance objectives established for a Project/Program;
		21	− Refine and re-validate the Statement of Operational Requirement (SOR), in an iterative process, and obtain its approval prior to the Implementation Phase, using the knowledge gained from the Definition Phase studies to make it realizable (i.e. technically feasible and financially affordable);
		22	− Ensure that the final Project Approval for Definition (PA(Def)) represents a manageable Project/Program from the viewpoint of the Project Manager and other involved staffs; and
		23	− With the cooperation and advice of the Project Manager, act as a focal point, through Director General Public Affairs, for public relations and dealing with the media when directed by the Project Leader.
	Implementation and Close-out	24	− Monitor the Implementation Phase activities and provide support to the implementing organization as necessary;
		25	− Approve decisions with respect to changes which impact the satisfaction of the operational requirements;
		26	− Participate in decisions which impact the project cost, schedule and performance objectives;
		27	− Represent the Sponsor organization in Project Team discussions and report to the committee(s) for resolution of problems which are beyond the mandate of the Project Directive as detailed in the Charter; and
		28	− Approve the Project/Program Completion Report prepared by the Project Manager.
	Duties	29	− Prepare and obtain approval of all mandatory Project/Program documents; − Ensure all necessary functional organization inputs are incorporated in the Identification of resources and activities required for Project/Program Definition;

Position	Phase	Serial	Responsibility
			− Produce the Statement of Operational Requirements (SOR) and obtain its approval; − Manage resources during Identification (ID) and Options Analysis (OA) Phases; − During Definition: participate in decisions with respect to the fulfillment of Project/Program objectives; provide concurrence to all changes concerning cost, schedule and performance; approve and document all operational requirement changes; re-validate the Statement of Operational Requirements (SOR); and − Monitor the Implementation Phase and participate in decision making with respect to changes which impact on operational requirements, cost, schedule or performance objectives.
Project Manager	General	30	The Project Manager is responsible for the overall direction and of coordination of activities during the implementer leadership period of a project. The Project Manager coordinates and integrates activities across multiple, functional lines to acquire the option selected by the Defence Capabilities Board (DCB) and achieve project objectives in terms of scope/performance, cost and schedule. Early involvement of the Project Manager to support the Project Director in the conduct of Options Analysis (OA) and project planning activities while project leadership which rests with the sponsoring organization is critical to ensure project success.
	Responsibilities	31	− Represent and report through the normal Chain of Command to the Group Principal of the implementing organization;
		32	− In the sponsor leadership period, provide support to the Project Director and ensure that planning activities necessary for the Implementation of the Project/Program are undertaken;
		33	− Manage the team of management specialists engaged in carrying out the activities of a Project/Program; and
		34	− Manage project management activities during the implementer leadership period of the Project/Program.
		35	− Provide assistance to the Project Director in the production of, and changes to, the Sponsor's mandatory documents;
		36	− Recommend endorsement of changes to the decision documents and major contractual arrangements to the Project Implementer; and
		37	− Prepare and submit intra/interdepartmental Project/Program status/progress reports as required during the Project/Programme.

Position	Phase	Serial	Responsibility
	Identification and Options Analysis	38	− Provide the Project Director with the costing and technical estimation of each option and assist in the determination of Project/Programme management resources (e.g. funding, materiel, etc.) required;
		39	− Ensure that members of the matrix Project Team prepare and provide relevant studies and analyses as appropriate that define and support Project/Programme related statements of the technical options, specifications, costs, Implementation schedule, development activity, tests and evaluation, staffing ramifications including training, logistic and maintenance support; and ensure their compatibility with departmental policy and the approved operational requirements that are to be satisfied;
		40	− Ensure the requisite Implementation documents are prepared and contracts let as necessary;
		41	− Ensure that defence industrial preparedness considerations (sustainment planning) are adequately addressed by the Project/Programme;
		42	− Lead for Defence Procurement Strategy (DPS) / procurement matters with the support of applicable procurement organizations;
		43	− In conjunction with the Project Director, ensure the necessary Definition and coordination of all project management personnel requirements and validate requests for incremental personnel presented by NDHQ agencies tasked to support the Project/Program; and
		44	− Coordinate the distribution of Project/Programme plans, ensuring appropriate preparations are made for the end product's successful introduction into the In-Service stage in accordance with the Lifecycle Management System (LCMS).
	Definition and Implementation	45	− Manage activities in accordance with the approved Project Management Plan (PMP) and ensure that the Project Director is advised immediately of any developments which could lead to changes to Project/Program performance, schedule or cost;
		46	− Ensure problems and differences are resolved at the lowest possible level;
		47	− Coordinate functional organization inputs and prepare requisite Implementation documentation;
		48	− Coordinate all requests for Implementation support from the NDHQ functional organizations and from the ECS(s);

Position	Phase	Serial	Responsibility
		49	− Advise the Project Director, Project Leader and Senior Review Board (SRB) of any significant developments which may affect a Project/Program in meeting its objectives and identify what corrective actions have been or should be taken;
		50	− During the Implementation Phase only, with the cooperation and advice of the Project Director, act as a focal point, through Director General Public Affairs, for public relations and dealing with the media when directed by the Project Leader;
		51	− Ensure that all approved Project/Program objectives are met, within assigned resources;
		52	− Ensure the end product meets the technical specification derived from the Statement of Operational Requirements (SOR) as coordinated with the Project Director;
		53	− Ensure effective transition to the In-Service stage; and
		54	− Responsible to prepare the Project/Program Completion Report.
	Duties	55	− Manage all Project/Program resources through the tasking of functional organizations in accordance with the authority delegated to him; − Coordinate inputs from functional organizational units to studies and analyses that define and support Project/Program related specifications, costs, Implementation schedule, tests and evaluations, training, facility, logistics, engineering and maintenance support; − Provide assistance to the Project Director in the production of and changes to all mandatory Project/Program documents; − Coordinate the preparation of the Project Management Plan (PMP), with the concurrence of the concerned functional organizations, ensuring appropriate preparations are made for successful introduction of the capability packages that constitute the Project/Program; − Manage the resources assigned to the Project/Program; and − Advise Senior Management of any significant developments which may affect the Project/Program in meeting its objectives and what corrective action has been or should be taken.

Source: Department of National Defence, Project Approval Directive version 1.1

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