

Creating an Acquisition Model that Delivers

La création d'un modèle d'acquisition qui donne des résultats

Vimy Paper 1
Cahier Vimy 1



Conference of Defence Associations Institute
(CDAI)

L'Institut de la Conférence des associations de la défense
(ICAD)

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**VIMY PAPER 1
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**Promouvoir un débat public éclairé
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CONFERENCE OF DEFENCE ASSOCIATIONS INSTITUTE (CDAI)
L'INSTITUT DE LA CONFÉRENCE DES ASSOCIATIONS DE LA DÉFENSE (ICAD)

The CDAI is a charitable and non-partisan organization whose mandate is to provide research support to the Conference of Defence Associations (CDA) and promote informed public debate on national security and defence issues.

The CDAI fulfills its mandate through the following activities:

Vimy Award Dinner – Benefit gala recognizing the *Vimy Award* recipient (an outstanding Canadian who has contributed meaningfully to the defence and security of Canada), and the *Ross Munro Media Award* recipient (a journalist who has made an outstanding contribution to the general public's understanding of Canadian security and defence issues).

Annual Seminar – Canada's most highly acclaimed debate on defence issues, held in Ottawa, in February.

L'ICAD est un organisme caritatif et non partisan qui a pour mandat d'offrir un soutien de recherche à la Conférence des associations de la défense (CAD) et de promouvoir un débat public éclairé sur les enjeux de sécurité et de défense nationales.

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Tables rondes et allocutions – dans le cadre desquelles des conférenciers éminents abordent les enjeux d’actualité.

Foreword

General Paul Manson (Ret'd)
President CDAI

The Conference of Defence Associations Institute is pleased to publish this, the first in a series of monographs to be called **The Vimy Papers**, each of which will offer expert opinion and factual commentary on a specific and important subject related to national defence.

This inaugural paper, although concise, lays out a comprehensive picture of the crisis in defence acquisition in Canada today. More importantly, it presents considered ways to resolve the crisis; hence its title **Creating An Acquisition Model That Delivers**.

The timing of this publication is no coincidence. Coming so soon after the election of a new Conservative Government under Prime Minister Stephen Harper, we see a window of opportunity through which the government, led by the Minister of National Defence, can initiate and execute changes to an equipment acquisition system that over the years has become quite dysfunctional, to the point where

Avant-propos

Général Paul Manson (ret.)
Président de l'ICAD

L'Institut de la Conférence des associations de la défense est heureuse de publier la première d'une série de monographies intitulée les **Cahiers Vimy**; chacun de ces documents donnera des opinions d'expert et des commentaires factuels sur un sujet précis qui est important à la défense nationale.

Le document inaugural, bien que concis, brosse un tableau détaillé de la crise dans laquelle est plongé le processus d'acquisition du secteur canadien de la défense. Avant tout, il présente des moyens censés de résoudre la crise, d'où son titre : **La Création d'un modèle d'acquisition qui donne des résultats**.

Le choix du moment de la publication de ce document n'est pas une coïncidence. Tout juste après l'élection d'un nouveau gouvernement conservateur sous la direction du premier ministre Stephen Harper, nous voyons une conjoncture propice à ce que le nouveau gouvernement, mené par le ministre de la Défense nationale, initie et apporte des changements au système

procurement cycles of 15 years or more are common.

But fixing the system, although necessary, is not sufficient. It must be put quickly to work to resolve the distressing state of the Canadian Forces' equipment holdings, some of which are beyond the critical stage, a consequence of acquisition system difficulties and political foot-dragging over the past decade or two.

The urgency is all the more acute in light of the operational challenges facing Canada's military today in a troubling and unstable world. Some Canadians may not admit it, but our country is at war. We face an insidious terrorist enemy not bound by moral restraint or geographical limits. For the first time in almost two hundred years our own territory could become a battleground. Unless the Canadian Forces are properly equipped to join like-minded allies in meeting the threat, our nation can expect difficult times.

d'acquisition de matériel qui est devenu très désorganisé, au point que des cycles d'approvisionnement de 15 ans et plus sont maintenant communs.

Bien qu'il soit nécessaire de réparer ce système, cette mesure en soi ne suffit pas. Il faut rapidement la mettre en œuvre pour résoudre l'état alarmant du matériel en dotation des Forces canadiennes, car son état a dans certains cas dépassé l'étape critique; il s'agit de la conséquence des difficultés rencontrées par le système d'acquisition, et d'un gouvernement qui traîne les pieds depuis plus d'une dizaine d'années.

Le besoin se fait encore plus pressant à la lumière des défis opérationnels que doivent relever les militaires canadiens d'aujourd'hui, face à une situation mondiale instable et troublante. Certains Canadiens ne l'admettent pas, mais notre pays est bel et bien en guerre. Nous faisons face à un ennemi terroriste insidieux qui ne fait l'objet d'aucune contrainte morale ni limite géographique. Pour la première fois depuis près de 200 ans, notre territoire pourrait devenir un champ de bataille. À moins que les Forces canadiennes ne soient correctement équipées pour se joindre à des alliés aux vues similaires et faire face à cette

menace, notre nation peut s'attendre à des temps difficiles.

This is a challenge not just for the Department of National Defence, or for other departments and agencies of government. Neither can the politicians alone be expected to resolve the acquisition problem. Ultimately it is the people of Canada (and the media who inform them) who must understand and support the changes that have to be made.

C'est un défi non seulement pour le ministère de la Défense nationale, mais également pour d'autres ministères et organismes gouvernementaux. Les politiciens ne peuvent résoudre eux-mêmes le problème d'acquisition. Il revient au bout du compte à la population canadienne (et aux médias qui les informent) de comprendre et d'appuyer les changements qui doivent être apportés.

This publication is presented as a step in the right direction, and in the hope that it will provide a stimulus to action.

Cette publication représente un pas dans la bonne direction, dans l'espoir qu'elle incitera à l'action.

General Paul Manson (ret'd)
President CDAI

A handwritten signature in black ink, appearing to read 'Paul Manson', written in a cursive style.

Le président de l'ICAD
Général Paul Manson (retraité)

Introduction

Richard H. Gimblett

The genesis of this collection of essays was the premise introduced in the Winter 2005 edition of ***On Track***, the newsletter of the Conference of Defence Associations Institute (CDAI), that “Procurement Deferred is Policy Denied.” Offering a list of “The Major Impediments to Defence Procurement”, that article concluded that the greatest gains in reducing Canada’s procurement gestation could be made by examining national acquisition strategies. CDAI quickly assembled a small team of experts to explore in greater depth the feasibility of the premise. The result is this first of ***The Vimy Papers***, entitled ***Creating an Acquisition Model that Delivers***.

Our timing is indeed auspicious, what with the publication of this volume coinciding with the recall of Parliament for the spring 2006 session. Making the acquisition process “work” has become all the more critical with the installation of a ministry committed to an ambitious rebuilding of the Canadian Forces. It is a time of

À l’origine de cette série de textes se retrouve le postulat mis de l’avant dans l’édition d’hiver 2005 du bulletin ***On Track*** de l’Institut de la Conférence des Associations de la Défense (ICAD) selon lequel « un approvisionnement reporté correspond au reniement d’une politique ». Cet article, après avoir établi une liste des principaux obstacles à l’approvisionnement de défense, conclut que la meilleure façon de réduire les longues périodes de gestation des approvisionnements en équipement au Canada consistait à travailler sur les stratégies nationales d’acquisition. L’ICAD a réuni une petite équipe d’experts pour examiner en profondeur la validité de ce postulat. Le résultat est cette première série des ***Cahiers Vimy***, intitulé ***La Création d’un modèle d’acquisition qui donne des résultats***.

Nous arrivons à point nommé dans la mesure où cette publication paraît au moment où le Parlement entame sa session de printemps. Faire en sorte que le processus d’acquisition « fonctionne » est devenu d’autant plus essentiel que nous avons maintenant un ministère décidé à réaliser un programme ambitieux

great hope. However, as someone else has noted, “hope is not a method.” If there is one major point to come out of this collection, it is that the Canadian Forces cannot, on their own, make the process work. Our readers are sure to include many in uniform and their civilian counterparts in the Department of National Defence’s materiel branch. Some of what we have written will be new to them, but not much. Instead, it is aimed more at the full range of politicians and media who must be mobilized to continue the momentum of support for reform, and the officials and bureaucrats from other government departments and secretariats whose energy is needed to instil some urgency to the implementation of our recommendations.

This slim volume does not pretend to have all of the answers, but it does give a fairly full exploration to what is wrong with the present system. Going beyond a simple recitation of woes, however, it presents some unfamiliar aspects of the acquisition problems

de reconstruction des Forces armées canadiennes. Nous traversons une période marquée d’espoir mais, comme quelqu’un l’a fait remarquer, « l’espoir n’est pas une méthode ». Et s’il y a une leçon qui se dégage de cette collection d’articles, c’est que les Forces armées canadiennes ne peuvent imposer le changement à elles seules. Nos lecteurs comprendront de nombreux militaires et leurs collègues civils de la direction générale du matériel au ministère de la Défense nationale. Certains aspects de ce que nous avons écrit ne seront pas entièrement nouveaux pour eux mais il en est bien d’autres qui le seront. En fait, ces articles ont pour cible la gamme complète du monde politique et des médias qui doivent être mobilisés pour maintenir l’appui à la réforme. Les autres cibles sont les fonctionnaires des autres ministères et agences gouvernementales dont la coopération énergique et soutenue est nécessaire pour susciter un sentiment d’urgence en faveur de la mise en œuvre de nos recommandations.

Ce mince volume ne prétend pas offrir toutes les réponses mais il fournit une analyse passablement profonde de ce qui va mal dans le système actuel. Allant au-delà d’une simple répétition des failles évidentes, ce cahier présente certains aspects méconnus des

generally facing the CF, puts into context the peculiarities of the disparate segments of the industrial base upon which the various services draw, and develops some principles to guide renewal. Our authors experienced the problems firsthand and from a variety perspectives: all were very senior players in the CF-DND establishment (notes on their biographies can be found at the end of the book), and most have gone on in retirement to careers in other related fields. There are sure to be critics who will dismiss them as shills for the military-industrial complex, if such a thing can be said to exist in Canada; a more generous interpretation would recognize that their already broad experience has become even better informed. None of them take advantage of this platform to pitch a product. Instead they write from the heart, committed to reform of an institution they love. With the twin benefits of distance and hindsight, they can offer candid advice, and in some cases speak the unspeakable.

problèmes d'acquisition auxquels font face les FC; il situe dans leur contexte les particularités des segments disparates de la base industrielle sur laquelle reposent les différents services ; enfin, les auteurs y mettent en exergue certains principes destinés à orienter le renouvellement. Ces auteurs ont fait face eux-mêmes aux problèmes identifiés et les ont vécu selon diverses perspectives : chaque auteur a occupé un poste de première importance au sein des forces armées canadiennes et du MDN – on trouvera leur biographies à la fin du cahier – et la plupart d'entre eux ont entamé une seconde carrière dans des domaines connexes. Il est évident que les critiques les taxeront de suppôts du complexe militaro-industriel comme si ce dernier existait au Canada. Une interprétation plus généreuse consisterait à reconnaître que leur expérience déjà vaste s'est affinée encore davantage. Aucun des auteurs ne se sert du podium qui lui est offert pour faire la réclame d'un produit. Ils écrivent ce que leur cœur leur dicte, reflétant leur engagement désintéressé à la réforme d'une institution qu'ils adorent. Avec l'avantage de la distance et de l'expérience, ils peuvent offrir des avis sincères et même risquer de dire des choses que l'on n'oserait pas articuler en temps normal.

Our authors explore a number of options, many running counter to received wisdom. Paul Manson and Howard Marsh, respectively the President of CDAI and senior analyst of the Conference of Defence Associations, look at the constraints under which the CF, DND and industry must labour, and graphically illustrate that “the consequences of continuing down the current path are serious, real and untenable.” Pierre Lagueux, now a senior partner of a major consulting firm, draws upon his time at the helm of the materiel branch to define a defence acquisition strategy touching upon issues that cross departmental boundaries and impact on how industry responds to requirements. The remaining chapters develop aspects of this strategy. As President of the Shipbuilding Association of Canada, Peter Cairns dispels many of the myths surrounding what is in reality a vital and innovative strategic industry with the capacity to meet the challenges ahead. Howard Marsh returns for a closer look at army acquisitions, concluding that the major decisions regarding weapon systems already have been made and that the focus now must be on the complex “human-equipment interface” to support the soldier in the field. Paul Manson also explores the challenges and opportunities in air force acquisitions that, without recognition of the many significant

Nos auteurs envisagent diverses possibilités, souvent jugées dans le passé comme allant à l'encontre de la logique intuitive. Paul Manson et Howard Marsh, respectivement président de l'ICAD à l'époque et l'Institut de la Conférence des Associations de la Défense, analyste principal de la Conférence des Associations de la Défense, examinent les contraintes sous l'empire desquelles les FC, le MDN et l'industrie doivent fonctionner, et illustrent de façon graphique que « les conséquences d'une continuation de la politique actuelle sont graves, sérieuses et insoutenables ». Pierre Lagueux, aujourd'hui associé chez une grande société de consultants, puise dans son expérience à la tête de la direction générale du matériel pour définir une stratégie d'acquisition en matière de défense qui recouvre les questions de coordination interministérielles et leur impact sur la façon dont l'industrie répond aux exigences. Les chapitres suivants élaborent les différents aspects de la stratégie. En tant que Président de l'Association de la construction navale du Canada, Peter Cairns évacue les nombreux mythes qui entourent ce qui est en réalité une industrie stratégique novatrice et vitale, à même de relever les défis que lui réserve l'avenir. Howard Marsh examine à nouveau les acquisitions pour l'armée de terre et conclut que les grandes

niche competencies of our viable aerospace sector, are too often dismissed as off-the-shelf purchases from foreign suppliers. Brian Macdonald has been a regular contributor to past CDAI efforts and will be replacing Howie Marsh as senior analyst; in order to underscore the criticality of time delays imposed by the present “intended rationality” acquisition process, he looks at two case studies in joint acquisitions that have gone awry, and argues that it now makes increasing sense to adopt an alternate “satisficing” model. Finally, the concluding chapter presents a defence acquisition template that balances the various military, political and industry expectations.

décisions en matière de systèmes d’armement ont déjà été prises et qu’il faut maintenant faire porter tous les efforts sur la relation entre la facteur humain et l’équipement commandé pour mieux appuyer le soldat sur le terrain. Revenant sur le sujet à son tour, Paul Manson approfondit les défis comme les possibilités qui se présentent en ce qui concerne les équipements de la force aérienne, thèmes que l’on a tendance à trop simplifier comme s’il suffisait d’acheter « à l’étalage » ce qu’offraient les fournisseurs étrangers, sans prendre le moindre compte les créneaux de compétence significatifs de notre propre secteur aérospatial. Brian Macdonald est un artisan et collaborateur assidu de l’ICAD et remplaçant de Howie Marsh comme analyste senior; il examine deux études de cas d’acquisitions interarmées qui sont allées de travers pour bien marquer combien les délais imposés par « la rationalité voulue » dans le processus d’acquisition ont un impact délétère. Il soutient qu’il est grand temps d’adopter un modèle plus satisfaisant d’approvisionnement. Enfin, le dernier chapitre présente un modèle ou forme de référence qui établit un équilibre entre les attentes des militaires, du monde politique et de l’industrie.

As admitted at the outset, and notwithstanding the provision of the template in the concluding chapter, this volume cannot hope to be conclusive. Discussions amongst the authors, as we arrived at some solutions in the course of our investigations, pointed to many new avenues for further research. Especially promising are the possibilities for war gaming and modeling and simulation at the strategic level, to determine if the national industrial base can really support the Canadian Forces or how best to deliver capabilities through an as-yet unwritten national procurement strategy. Indeed, the “elephant in the room” of this study is the absence of such a national strategy. If there is an unfulfilled logic to the arguments presented here, it is the need to re-establish an organization resembling the Department of Defence Production, which in the 1950s enjoyed the benefits of such a strategy and what seems to have been a better relationship between DND and its contracting department, supported by the full political weight of the central government and the strategic engagement of industry.

Nonobstant l'existence d'un modèle, comme on l'a admis dès le départ, ce cahier ne peut espérer fournir toutes les réponses. Les discussions que les auteurs ont eues au cours de l'élaboration de solutions au fil de nos recherches démontrent qu'il existe de nombreuses pistes d'investigations additionnelles. Nous avons trouvé que les possibilités les plus prometteuses se situaient au niveau des jeux et modèles de guerre ou des simulations à l'échelle stratégique, afin de déterminer si la base industrielle nationale peut véritablement soutenir les Forces canadiennes ou fournir les capacités nécessaires dans le cadre d'une stratégie nationale d'approvisionnement qui reste encore à concevoir. En effet, le noeud gordien de cette étude, c'est le constat de l'absence totale d'une telle stratégie nationale. Et s'il existe une logique intuitive découlant des arguments présentés ici, c'est la nécessité de rétablir l'ancien ministère de la Production de Défense qui existait dans les années 50 quand le Canada avait adopté une telle stratégie. Ou encore, songeons à l'instauration d'une meilleure relation entre le MDN et son secteur des contrats et approvisionnements, avec l'appui plein et entier du gouvernement dans son ensemble et l'engagement stratégique de l'industrie.

But waiting for the perfect solution to the Canadian military acquisition conundrum is not, as Brian MacDonald would observe, a very “satisficing” stance. Time is critical. If the process is ever to be fixed, there is no better time to start than now.

Mais attendre la solution idéale aux tribulations des acquisitions militaires canadiennes, comme le fait remarquer Brian Macdonald, n'est pas une attitude particulièrement satisfaisante. La situation est urgente et si nous voulons créer un processus rentable, c'est le moment idéal pour commencer.

Chapter 1

Recognizing the Problem

Prendre conscience du problème

Paul Manson and Howard Marsh

Abstract: *The acquisition of military equipment is a hot topic, one that has brought Canada's military to a critical stage. Previous governments have for too long deferred replacement of deteriorated equipment, with the result that operational capabilities have suffered. Faced with a backlog of expensive equipment replacement decisions, today's Government must contend with an old procurement dilemma: Which player should the process favour - Canadian industry, the federal bureaucracy, politicians or the military? Designing a new process that satisfies the expectations of the first three of these players without negatively affecting those of the fourth requires strong and innovative leadership.*

Résumé: *L'acquisition d'équipement militaire est une question brûlante qui a atteint des proportions de crise pour les forces armées canadiennes. Les gouvernements précédents ont reporté pendant trop longtemps le remplacement d'équipements dont l'état est devenu déplorable au point de miner les capacités opérationnelles des forces. Faisant face à une accumulation de décisions à prendre en matière de remplacements d'équipements coûteux, le gouvernement doit aujourd'hui traiter du problème classique d'approvisionnement: quel intervenant le processus doit-il favoriser – l'industrie canadienne, la bureaucratie, le monde politique et les forces armées? La conception d'un processus nouveau qui réponde aux attentes des trois premiers sans faire du tort au quatrième exige un leadership à la fois novateur et déterminé.*

The acquisition of equipment and related services for the Canadian Forces has become one of the hottest subjects in town. The reason is simple: the situation, long deteriorating, has now reached the critical stage. Failure to fix the process might result in a breakdown in military operations, at a time when these are especially demanding and vitally important to national security.

The problem and its symptoms are well known. Bringing complex new systems into service is taking much longer than it used to, typically 15 years or more from government go-ahead to operational employment by the military. This is the result, in large part, of an increasingly burdensome bureaucratic process, not just within the Department of National Defence (DND), but also within the federal government at large. The problem within DND is compounded by other factors,

however. Competition is usually a good thing, but in Canada, it is fierce within the defence industry, each component of which sees as its rightful share a substantial portion of the \$2.5 billion allocated yearly to the purchase of new equipment and services.

Then there is the difficult question of political involvement. This utterly necessary component of the procurement process is often motivated by petty regional considerations, not to mention unreasonable fear of public and media reaction, especially in regard to “big-ticket” items like ships and aircraft. When a federal election intervenes, the ‘politics’ of procurement often brings the system to a state of near paralysis.

Fortunately, not all new equipment takes 15 years to enter service. All too often, however, the Canadian Forces do experience lengthy delays in the introduction of necessary replacements, the result of which is an extra burden of high cost and physical risk in keeping the old equipment in service long after the “use before” date has expired. The C-130 Hercules air transport aircraft and the Sea King helicopters, whose replacements will enter service some 30 years after the need to do so was established, are often cited as examples of a seriously flawed procurement system.

What can be done about this state of affairs? Research and analysis undertaken recently provides a clear picture of some of the “root causes” of dysfunction in the military equipment acquisition process.¹

These studies reveal that the gradual evolution of a very cumbersome bureaucratic process is a major source of difficulty, if only in its delaying effect. Much of the complexity lies within DND, but to be fair that department must guide its capital projects through a plethora of interdepartmental processes involving the Treasury Board Secretariat, Public Works and Government Services, the Department of Industry, the Finance Department, other government departments, regional agencies and, ultimately, the Privy Council Office. Bringing numerous key senior government officials together for an interdepartmental review can be a frustratingly slow process. Furthermore, given that a significant number of government departments and agencies have veto power over DND procurement proposals, each of them must be treated with considerable deference.

Within DND, risk-aversion has resulted in “Statement of Requirements” documents consisting of many thousands of pages.² In effect, the department’s

¹ See for example Douglas L. Bland (ed.), *Transforming National Defence Administration* (Kingston: Queen’s University, 2005), prepared with the Conference of Defence Associations Institute.

² Glaring examples are the engineering specifications for the Light Armoured Vehicle family (Bison, Coyote and LAV III) running to 760 pages, and for the Canadian Patrol Frigate that weighed-in at nearly

technical experts all too often produce detailed design specifications for the required new item of equipment when they should rather be telling industry, in simple operational terms, what the new equipment is required to do. Not only is the existing approach time-consuming, it also constrains industry's ability to respond and can open the door to accusations (as have recently been made in the Sea King replacement competition) that the technical specifications have been manipulated in such a way as to favour one equipment solution over another.

Making matters worse is DND's deficit in personnel qualified in preparing statements of requirement and in managing equipment procurement programs. That deficit adversely affects the department's ability to move quickly in developing equipment Statements of Requirement and Concepts of Employment (both of which lead to the production of the Request For Proposal), to the evaluation of industry responses, and to the staffing of projects through the bureaucratic maze leading to the federal cabinet where acquisition decisions are made.

Canadian industry, for its part, is frustrated by what it sees as an insensitivity within DND towards the capacity of Canadian companies to meet the equipment needs of the Canadian Forces. Increasingly, believing they are about to lose a given competition, companies will resort to lobbying politicians or to launching legal challenges, actions that sometimes lead to lengthy delays in procurement decision-making.

To be sure, when hundreds of millions or billions of dollars are involved, military equipment procurement decisions have a political dimension. In recent decades, federal politicians have been acutely aware that the Canadian public, even if favourably disposed to the CF (and this has not always been the case), frankly rates the expenditure of tax dollars on major military equipment as a lower priority than social services that more directly impact their daily lives. The media, for their part, never miss an opportunity to play up this angle for a good story, to the extent that the federal cabinet tends to be gun-shy about such purchases and will hedge, sometimes for years, without making a decision. It is no wonder, in this environment, that a 15-year procurement cycle has become common. This situation has recently become even more problematical with the practice of publicizing the life-cycle costs of major crown projects (that is, lumping in lifetime support and operating costs with the purchase cost). Although this is sensible from an accountability perspective, the general public does not understand the

2000 pages. An encouraging sign of reform is the recently released Statement of Requirement for the Joint Support Ship (JSS SOR), at a concise 4 pages:
http://www.forces.gc.ca/admmat/dgmeprm/pmojss/docs/JSS_SOR_V3_18-May-05.pdf

distinction, and sees only the huge numbers that result. (If the lifetime cost of a typical family car were calculated this way, it would appear to be about \$195,000!)

Can the system be fixed?

It has to be. The consequences of continuing down the current path are serious, real and untenable. Successive political delays over the past three decades have led to a bow wave of unfulfilled equipment requirements so large that catch-up is out of the question. Most of what has to be bought right now is not readily available. Interim solutions exist, but even they take time. Consider the case of the Fixed Wing Search and Rescue (SAR) replacement. Even if a contract were signed today for an in-production aircraft, delivery would still be 3-5 years away. In the meantime, aircraft are being grounded for safety reasons.

General recognition of the urgent requirement to reform the Canadian Forces presents an opportunity to get things back on track. This will succeed only if the systemic problems facing defence procurement are corrected very quickly. Accomplishing this will take political leadership of the highest order. The Prime Minister and his cabinet colleagues must lead this process by ensuring that all measures required to make the defence procurement system work effectively, efficiently and speedily, are taken.

Chapter 2

A National Defence Acquisition Strategy

Pour une stratégie nationale d'acquisition d'équipement de défense

Pierre Lagueux

Abstract: *Defence acquisition is complex, but it can be managed better. The chapter begins by identifying five core objectives that any acquisition strategy must satisfy to ensure a more consistent and timely outcome. These objectives are not unique to Canada, but tend to be universally accepted, although perhaps unevenly managed, in most western Defence Departments. The last objective, facilitating government's ability to use defence procurement as a lever to achieve other worthwhile wider objectives, is often most controversial, but no less necessary. The chapter then presents a number of key attributes that should define a Defence Acquisition Strategy that respects the previously discussed core objectives. While many of the recommendations focus on internal Department of Defence processes, they also touch on issues that cross-departmental boundaries and impact on how industry responds to requirements. If implemented, significant benefits in terms of timeliness and predictability will accrue to all parties involved in defence acquisition.*

Résumé: *L'acquisition en matière de défense est une question éminemment complexe mais rien n'empêche de mieux la gérer. Cinq objectifs de base sont au cœur de toute stratégie d'équipement pour obtenir des résultats plus probants et plus respectueux des échéanciers fixés. Ces objectifs ne sont pas spécifiques au Canada. En fait, ils sont universellement acceptés par la plupart des ministères de la Défense en occident, même s'ils ne sont pas gérés de façon constante. Le dernier objectif des cinq évoqués, qui consiste à permettre au gouvernement de se servir de l'approvisionnement de défense comme un moyen de réaliser des objectifs plus vaste est celui qui soulève le plus de controverse tout en étant aussi nécessaire que les autres. Sont ensuite décrits dix attributs que devrait respecter une stratégie d'équipement de défense pour prendre en compte les objectifs de base. Bien que bon nombre des recommandations portent sur les processus internes dans le ministère de la Défense, elles couvrent également les points de jonction interministérielles et la façon dont l'industrie répond aux exigences et critères imposés. Si ces recommandations étaient mises en œuvre, tous les intervenants dans le domaine de l'approvisionnement en équipement de défense y gagneraient tant au plan des échéances qu'en termes de prévision.*

I once travelled in a country where the locals spoke neither English nor French. At one point, as I was trying to obtain directions, my interlocutor, sensing that I did not understand the language, tried to help me by repeating the instructions *louder*. I am not sure what logic drove the rise in decibels, but obviously it did not work. I have since witnessed many occasions when two parties, having difficulty in understanding each other, resort to louder levels of the same rhetoric. And I also believe that what I witnessed on that occasion is one of the major reasons why the many voices, on all sides of the Defence Procurement Reform issue, are speaking *louder and louder*. Why is that, and what is missing to make the discussion more productive?

Defence acquisition by its nature is a complex, expensive and technology intensive business. Procurements are uncertain, both in terms of schedule and requirements, with a small pool of suppliers dependent on winning the relatively few contracts to survive. The process is financed by a government that understands little of the military requirement, must divert dollars from other pressing needs to support defence procurement, and therefore seeks to achieve many other non-defence objectives simultaneously from the same dollars. It is inherently a very risky process, overseen by a government that is extremely risk-averse. That it delivers anything at all should be quite surprising. Nonetheless, it does, but in a most inefficient and time-consuming manner.

With dollars at a premium and the rapid pace of technological change, a new strategy is needed that fundamentally changes how defence acquisition is carried out. This chapter will attempt to identify the major attributes of such a new approach, but before that can be done, there must be agreement on the objectives desired.

Fundamentally, there are five core objectives that a defence acquisition strategy must satisfy:

- the strategy must ensure that the Armed Forces receive the equipment that meets *their* approved and defined operational requirements;
- it must do so in a timely manner;
- value for money must be, and be seen to be, obtained;
- risk must be managed equitably with industry; and,
- the strategy must facilitate government's ability to use defence procurements as a lever to achieve other worthwhile "wider" objectives (industrial benefits, technology transfer, regional development, and so on).

While the first three of these objectives seem to be well understood and accepted, the last two objectives deserve further discussion.

Insufficient analysis and understanding of the risk inherent in large defence procurements is the leading reason why so many acquisitions take so long and cost so much. Indeed, in a recent report, the United States Defense Acquisition Performance Assessment Committee recommends that the US Department of Defense (DOD) move to a “risk-based” source selection process.³ In other words, the approach to effectively manage risk should not be to attempt to avoid it by moving it entirely on the contractor’s shoulders. That only leads to escalating unrealistic demands and expectations from the defence department, which instead (at least from their perspective) considers the project to be risk free. In consequence, the contractor, being uncomfortable with the risk distribution, mitigates his position through significant price buffers. To avoid these distorting effects, the procurement and contracting regimes must allow for the equitable distribution and management of risk between the contractor and the government throughout the project’s life. Risk (in terms of cost, schedule and performance) is always present. The key is to assign the management of the particular risk to the party who is best positioned to manage it.

The last objective is perhaps the most controversial: recognizing explicitly that a defence acquisition strategy must cater to the legitimate prerogative of the government to use defence procurement as a lever to achieve other objectives. All nations, including the United States, to some extent use defence procurement to help achieve other government objectives. In its recently released White Paper on a Defence Industrial Strategy, the United Kingdom government makes explicit mention of “wider factors” that will impact on its defence procurement.⁴ Some of the factors mentioned in the White Paper include industrial participation (or industrial benefits as it is called in Canada), industrial regional activity, generation of high value economic activity (jobs), and technology transfer. Because including such wider factors as part of defence procurement can in fact have a financial cost, it is often argued that other government budgets – not the defence budget – should pay for them. However, as all funding comes from the same government, it is really a zero sum game. There is only so much money in the government coffer, and because the dollars are limited and the demands much greater, it is good government policy to satisfy as many demands as possible from the same dollar. DND, as one of many departments of government, must contribute to wider government policies. However, in

³ US Department of Defense, *Defense Acquisition Performance Assessment* (January 2006); at: www.acq.osd.mil/dapaproject

⁴ United Kingdom, *Defence Industrial Strategy, Defence White Paper* (December 2005); find by using the “search” function on the Mod UK home page: <http://www.mod.uk/DefenceInternet/Home/Index.htm>

achieving wider objectives, care must be taken that they must never be allowed to interfere with the accomplishment of the first two over-riding objectives.

So what should be the attributes of a Defence Acquisition Strategy that would respect the five core objectives?

Acquisition is more than just procurement. The acquisition process begins at the requirements definition stage and goes right through to award of contract, product acceptance and final payment. To be successful, a defence acquisition strategy must ensure that the entire end-to-end process flows smoothly, and delivers on the objectives previously stated.

At the start then, no acquisition should proceed without a clear, understood and accepted statement of the capability deficiency that is to be rectified, and how that capability will fit into the overall Canadian Forces requirements. Equally important, and what is not done now, it should be clearly stated what the newly acquired capability is *not* intended to rectify, in order to prevent requirement creep and the lead to a need for costly Canadian unique solutions. However, in order to be able to produce such statements of capability deficiency in the future, DND must immediately start to develop and train requirement determination staffs with the necessary skills.

The strategy should encourage detailed communication with industry at the earliest stages of a new acquisition, with discussion focusing on how to satisfy the required capability as opposed to discussing specific equipments. Indeed, the solution to satisfy the capability deficiency may not be an equipment procurement at all.

Once the capability deficiency is well defined and the approach to rectifying it also defined, integrated government acquisition teams should be assembled to determine a procurement approach. These can be stand alone, or in the case of very large acquisitions they can be matrixed. They must include various DND players, as well as members from other government departments who have a legitimate role to play in ensuring wider objectives are considered. However, for such teams to work effectively there must be a clear recognition of the role of each player in the team, and each player must be equipped with the detailed skills and knowledge necessary to allow him to fulfill his specific role. The lack of experience, skills and knowledge across all departments is a major deficiency that exists today; it will need significant attention, time and interdepartmental co-operation to correct.

In defining the procurement strategy to be used, the approach should not simply be to identify the risks associated with the strategy and then determine how to mitigate those risks. Rather, the risks should first be identified and then a procurement strategy that minimizes risk adopted as a risk mitigator in and of itself. Residual risk should then be assessed as to how it will be managed, not viewed as something that can be avoided somehow in the future. An off-the-shelf procurement strategy, for example, can clearly reduce much (but not all) risk.

Where it is determined that solving the capability deficiency is best done through acquiring a service as opposed to equipments, the requirement should be expressed to the maximum extent possible in terms of performance specifications. This entails a contracting regime quite different from one where exact technical specifications are the selection criteria. Evaluation methodologies and contract compliance measures must be developed and employed that support a performance specification approach. Such a regime is, at best, ill-defined today.

When considering the selection of a supplier, corporate past performance should be a considered factor in the contract award. This has always been a difficult concept to implement, as it is argued that evaluation of past performance can be too subjective or that it effectively limits the ability of new entrants to compete. Subjectivity can be significantly controlled by having government and industry together develop a past performance evaluation matrix that is then available for use in future competitions. As for new entrants into a competitive field, they should rightly be viewed, until proven otherwise, as more risky. Again, a collaboratively developed template that would be the basis of new entrants' potential performance evaluation should be possible.

Inevitably, the aim of all acquisitions is to ensure that industry satisfies the contractual obligations. Hence an acquisition strategy must realistically recognize industry as a partner in the process – not as an adversary to be defeated – with legitimate expectations, whether financial or otherwise. While the government should get value for money, industry should get value for participating. Procurement strategies must be realistic and made clear as early as possible so neither side wastes time and resources. There is nothing wrong with a sole source approach *per se*. Competition is not always the best strategy. Each has its place. What is important is to be logical and consistent in deciding, and making the decision early in the process.

A defence acquisition strategy should be linked to a defence industrial base strategy, such as the previously mentioned UK White Paper on Defence Industrial Strategy. The acquisition strategy would then be clear on what

capabilities and technologies are to be sourced from within Canada, how acquisition will support research and development investment, and what skills need to be maintained indigenously. Unfortunately, there is no defence industrial base strategy in Canada; hence the approach to the above issues is inconsistent, to the detriment of industry.

The acquisition strategy should be based on positively providing incentives to industry to perform (or outperform) rather than negatively penalizing for non-performance. Liquidated damages may hurt the non-performer, but they do not put “rubber on the ramp”. That is not to say that penalties should never be used, but a more explicit use of positive incentives may be more productive, recognizing that the ultimate objective is to deliver the good or service on time, at cost, and as per specification. Like it or not, once the contract is signed, industry and government are in it together, often without either having full knowledge of what to expect.

Finally, the defence acquisition strategy must prevent any project from entering the departmental strategic investment plan if it does not have a realistic cash flow profile. Identification of a capability deficiency in the investment plan must remain the starting point for expending resources on rectifying that capability deficiency. Resource expenditure must proceed with the expectation of a timely, successful outcome. Projects should be “gated” under specific timelines, subject to cancellation unless extenuating circumstances dictate otherwise. Acquisitions that take 15 years to first delivery consume significant resources that might be better spent on getting the “good enough” in service in a fraction of the time.

The prescriptions described above for a revitalized Defence Acquisition Strategy are not entirely new. Some are actually part of the existing process. Indeed, as far back as April 1992, in a document entitled *Canadian Defence Policy 1992*, the government gave clear indication on how it would simplify acquisition, essentially by focusing on off-the-shelf equipment and reducing the number of types of equipment in service. However, these guidelines were never applied in an effective, consistent manner, and they seem still to be missing today. For the most part, large acquisitions currently are handled in an *ad hoc* manner; compromises are made as necessary to advance the acquisition with little consideration of the downstream risk implications or the impact on industry. Lurching from crisis to often-foreseeable crisis, acquisitions muddle along, saved only by huge contingency fund reserves, or they collapse amidst acrimonious finger pointing.

Defence acquisition indeed is complex, and the environment under which it exists makes it even more complex. But it can be better managed.

Chapter 3

Naval Shipbuilding

La construction navale

Peter Cairns

Abstract: *Canada's Navy requires vessels with global reach and capable of going in harm's way. This high degree of technical sophistication is within the capacity of our small but very capable and innovative shipbuilding industry. Adopting a continuous build strategy (e.g. one new vessel every two years) offers a number of positive outcomes for all partners – the Navy, the federal government and industry. A fair comparison reveals that within the major warship market, Canadian industry is cost-competitive. Canada is in the unique position where its shipbuilding capacity and its domestic requirements, both government and commercial, just about match. It should be just a matter of applying the present shipbuilding policy and smoothing out the procurement cycles to ensure the navy has the industry capacity it needs to build, convert, refit and repair its ships at a competitive price.*

Résumé: *La marine canadienne a besoin de vaisseaux capables de naviguer dans le monde entier et de faire face au danger. Ce degré de sophistication technique est tout à fait à la portée de notre industrie de construction navale dont les capacités et le caractère novateur compense largement ses dimensions réduites. L'adoption d'une stratégie de construction permanente – par exemple, un vaisseau tous les deux ans – offre de nombreuses possibilités à tous les partenaires – la Marine, le gouvernement fédéral et l'industrie. Quand on effectue une comparaison sérieuse, on constate que dans les grands marchés de la marine de guerre, l'industrie canadienne est concurrentielle. Le Canada occupe une position unique dans la mesure où la capacité de ses chantiers navals et ses besoins internes, gouvernementaux et commerciaux s'équilibrent plus ou moins. Il suffirait d'appliquer la politique actuelle de construction navale et d'ajuster les cycles d'approvisionnement pour faire en sorte que la marine dispose de la capacité dont elle a besoin pour construire, convertir, reconditionner et réparer ses vaisseaux à des prix compétitifs.*

Introduction

Canada is a maritime nation with a continental mentality. Few Canadians see the world's oceans or maritime affairs as relevant to their daily lives. Nevertheless one cannot deny the fact that we are surrounded on three sides by oceans giving us the longest coastline in the world, our offshore Exclusive Economic Zone (EEZ) represents an ocean area more than two thirds that of our landmass⁵ and our inland waterway is as long as the Atlantic Ocean is wide.

Since the First Gulf War and then the tumultuous events of 9/11 there has been increased concern about maritime security. Canada's dependence on trade requires in excess of three million TEU (twenty-foot equivalent unit) containers to move through Canadian ports each year. Ever-larger cruise liners present lucrative terrorist targets. Coupled with the requirement to train for hostilities, to meet international obligations, to protect offshore oil, gas, mineral and fish resources, to guard against illegal immigration, and to maintain arctic sovereignty, there is no shortage of work for Canada's navy.

Given these requirements and the Navy's experience of the past 15 years, it follows that it must be equipped with blue water vessels that are equally at home operating in the cold harsh environment of the North Atlantic and Pacific as they are also in the hot, humid, sand-laden atmosphere of regions like the Red and Arabian Seas. These ships of the 21st century will have a degree of technical sophistication and firepower that will be hard for the average Canadian to comprehend. The capabilities required will be costly but they will be absolutely necessary if Canada requires its sailors to go in harm's way.

Canada is fortunate, as the country possesses a small but very capable shipbuilding and marine industry with a long history of successful innovation in the construction of ships for the Navy.

During the Second World War Canada developed a shipbuilding industry that constructed 529 ships for war against the Axis. Canada went on to design and build the St. Laurent class destroyer escorts that came into service in the 1950s and served until the end of the First Gulf War. The Operational Support Ships and the Tribal (DDH-280) class destroyers followed them in the mid-sixties and early-seventies. Several of these ships are still serving with distinction today.

After a gap of about 10 years and after considerable hard-gained experience was lost due to inactivity, the domestically designed and constructed Canadian Patrol

⁵ *Leadmark: The Navy's Strategy for 2020* (CMS, 2001), at: http://www.navy.dnd.ca/mspa_news/news_e.asp?id=11

Frigate (CPF) was contracted. The CPF, like the St Laurent and Tribal classes, were considered the finest and most innovative warships of their day.

The small Maritime Coastal Defence Vessels (MCDV) followed the CPF. There has not been a major warship constructed in Canada since the last patrol frigate, HMCS *Ottawa*, was delivered in 1996.

The astute reader will have noted gaps of 10 to 15 years between building programs. With their attendant loss of experience and expertise, these gaps add a degree of complexity that does not need to be, and can be resolved when the right processes are put in place.

The Defence Industrial Base

The Defence Industrial Base is not a term that is used much today, but the requirement for a solid defence industry to support the Canadian Forces is still relevant. Maintaining an industrial base is a strategic issue that needs to be addressed at the highest level.

In the National Partnership Report of 2001 on the Canadian shipbuilding industry, the authors recommended that “the federal government formally recognizes the strategic importance of the shipbuilding and industrial marine sector.”⁶ The federal government’s response recognized the shipbuilding and industrial marine industry as an important contributor to national and regional economies,⁷ but fell short of considering it a strategic industry. If nothing else, this response can be viewed as indicative of how governments to date have viewed the importance of procuring equipment for the CF.

To address procurement issues confronting the CF as a whole and naval shipbuilding in particular, a fundamental long-term strategic decision must be taken that addresses the role of Canadian industry (Defence Industrial Base) in the acquisition, maintenance and life cycle support of CF weapons, vehicles and equipment.

Working With the Maritime Industry

The days of the great naval dockyards that repaired and maintained the Navy’s ships are over. The funding no longer exists to provide the wide variety of service that was once commonplace. There is no reason, however, that the

⁶ *National Partnership Project Report* (Canadian Shipbuilding Association, 2001), p. 52; link at: <http://www.shipbuilding.ca/policy.shtml>

⁷ *A New Policy Framework for the Canadian Shipbuilding and Industrial Marine Industry* (Ottawa: Industry Canada, 2001), pp. 16-17; at: <http://www.shipbuilding.ca/graphics/response-nc.pdf>.

commercial shipbuilding industry should not now be incorporated into the Navy's plans for future procurement and support. The time for partnership and utilization of commercial facilities has arrived. It is the only logical solution.

"Partnership with industry" has been a buzz-phrase for some time now. In almost every briefing from government it is mentioned as a desirable outcome. Yet the reality falls short of the goal. A partnership is just that. Both parties must share the risks and the rewards. It cannot happen when one party is risk-averse. The government is notorious for "talking the talk" but not "walking the walk", instead falling back on the old saw that "the regulations do not allow it". If partnership with industry is desirable, then the rules must be changed to allow it to happen. For government and industry to work together successfully there must be trust and support on both sides and risks and rewards must be equally shared.

The FELEX / INDUSTRY working group is an example of an incipient partnership with considerable potential. The work done by this group will allow the Frigate Life Extension (FELEX) program managers to put proposals to their superiors that they know have the support of industry. This close working association must now be carried through the whole project. Working in harmony with industry is a significant risk mitigation strategy that in the end will produce a superior product.

It is self-evident that the Navy needs commercial shipbuilding, repair and industrial marine support and should be considering it as a significant part of their building, repair and life cycle support requirement. What is not so clear is why the Navy has not hoisted this in and acknowledged it as part of their ongoing procurement strategy?

Unique Canadian Requirements – Why Not?

The accepted wisdom is that unique Canadian requirements escalate the costs of projects and therefore must be eliminated. Unproven solutions are discouraged at all costs. A proven design and a proven hull form are the order of the day.

It has been stated that our navy should be more like the Dutch navy. Those making this kind of statement need to be reminded that the Netherlands' area of ocean responsibility can be fitted neatly into Hudson's Bay. A strong argument can be made that the very much larger expanse of our offshore estate determines that our maritime requirements are unique. Should that not be acknowledged?

In reality there is no such thing as a pure off-the-shelf solution. Every proven vehicle will be altered in some way to meet the Canadian Forces' particular (i.e.,

unique) requirement. In extreme cases the end result will resemble a NASCAR racing car where only the form and name are off-the-shelf. This is not wasteful if the requirement is legitimate.

The keystone of any procurement is the requirement. The requirement must reflect the CF's maritime strategy. It goes without saying that it must be analyzed, re-analyzed and analyzed yet again until, as much as is humanly possible, it accurately delineates the Navy's need. The logic trail must be clear so that questions such as "why do we need to have this ship?" are unnecessary or easily answered.

Canadians are renowned for their innovative skills. The CPF, the Tribal, and the St. Laurent classes of ships were all leading edge technological marvels and the innovative equipment inside them too numerous to mention. The requirement must not prevent innovative solutions to be adopted when they clearly make sense.

The Acquisition Cycle

The fundamental problem with the acquisition cycle today is simply that it takes too long. Using the Joint Support Ship (JSS) as an example, from conception to reality, it will be about 18 years before the first ship enters the fleet. The building of the vessel is the easy part. It is in the definitions and approval process where delays occur, and it is this process where efficiencies must be achieved.

A Build Strategy for the Navy

Since the St Laurent class ships were brought into service in the 1950s there has been approximately 10-plus years between major building programs. During this down time experience and expertise have been lost. This has led to the inevitable question, at the start of each new building program: does Canada still have enough experience to build its own ships?

The simple way to deal with this is to build more often. The core of the recent Canadian fleet has been the 4 Tribal class and the 12 CPFs – 16 vessels in total. Building one of these ships every two years in a continuous build program would ensure that no ship is older than 32 years, vice the 40-plus years of the Tribals today with no replacement in sight. Decreasing the building interval to 1.5 years would reduce the age of the oldest ships by a further 8 years.

Adopting this kind of program would provide positive outcomes for the Navy, the federal government and the shipbuilding and industrial marine industry:

- naval ships would be more modern and thus more able to meet the ever changing requirements of modern warfare;
- federal government outlays and the DND budget and cash flows (including Army and Air Force) would be more predictable and manageable;
- the defence industrial base as it relates to maritime security would be maintained and strengthened;
- shipbuilders and industrial marine companies would be able to maintain their highly trained and specialized workforce, and leverage this expertise into commercial market opportunities;
- continuous work would lead to increased industry investment in R&D, new technology and production processes, and workforce training and renewal;
- Canada would reap the economic and social benefits from the high technology skills and jobs that accrue;
- new designs and engineering changes would be iterative in nature; and
- through production efficiencies, the cost per unit would decrease.

For this strategy to be successful, a significant culture change within DND and the Navy will be required. Most important of all, it will require the government in power to look beyond its present 4-year mandate. This is a strategy that has worked in other countries and can work here if there is the will.

Capability, Capacity and Competitiveness

For some the grass is always greener on the other side of the fence. “Why must we pay a premium? Surely it would be cheaper to build our naval vessels offshore.” This has almost become accepted wisdom. It is in fact perverted and specious reasoning. When comparing costs of building in Canada to offshore, one must ensure that apples are being compared with apples. In most comparisons this is not the case. Canada will not build its sophisticated warships in China or Viet Nam. Where we might build them (Europe and the United States) we are competitive. A few examples: cruise ships are converted and refitted in Canada because we are cost competitive; cargo vessels are being constructed in Canada for European owners because we are cost competitive; and sophisticated tugs are designed, built and sold internationally because Canada is cost competitive.

Another twist to the offshore argument points only to repair services as essential, so building should be able to be done anywhere. This argument fails to address where the highly skilled technicians that will repair the Navy’s ships will come

from. It is difficult to imagine that bright young engineers, naval architects and technicians will flock to an industry based solely on repair. The evidence is that they will not. For the last 10 years the shipbuilding industry has been operating at 35 per cent capacity and the core of the industry revenue has been from repair. One can see the detrimental affect of this when comparing the percentage of workers under age 25 in shipbuilding to other manufacturing sectors in Canada. In the other manufacturing sectors, 16 per cent of the workforce is under age 25, while in shipbuilding that number falls to 3 per cent.⁸ Canadian yards must build and repair to remain healthy and competitive.

The other question that is continually on the naysayers' minds is whether the Canadian shipbuilding and industrial marine industry has the capacity to meet the projected demand. There is no doubt that the demand is real. Projections to the year 2015 show that the industry has the capacity to meet the demand.

It is only in the years 2009 through 2011 that the projected demand approaches capacity. To be healthy the industry needs to operate consistently at a level between 65 per cent and 75 per cent capacity.

Conclusion

It is interesting that the United States, United Kingdom and Australia are now looking at sole sourcing versus competitive building strategies. This is mainly because lower production volumes have led to increased production costs and subsequently less efficient use of equipment and resources. Fundamentally these nations have an excess of capacity over demand that has to be resolved.

Canada is in the unique position where its shipbuilding capacity and its domestic requirements, both government and commercial, just about match. Given this it should be just a matter of applying the present shipbuilding policy and smoothing out the procurement cycles to ensure the navy has the industry capacity it needs to build, convert, refit and repair its ships at a competitive price.

⁸ *A Long Way Back* (Praxis Research and Consulting, 2003), p. 30.

Chapter 4

The Acquisition of Army Systems

Le processus d'acquisition des systèmes de l'armée de terre

Howard Marsh

Abstract: *Army acquisition differs from the other services in that the soldier is central to mission success. The Army equips the soldier while the other services man the equipment. Over the last several years, the Army has adopted a doctrine of integration of combat activity, a doctrine that has facilitated the attainment of commonality in a variety of weapon and other platforms, Information Age technologies, software and hardware. Convinced of the importance of clearly defining its future, it has, for some time now, successfully identified and established links to national providers - a strategy that will support the procurement of army equipment well into the next decade. The Army currently needs few decisions to complete its acquisition plan.*

Résumé: *Les acquisitions de la Force terrestre se distinguent de celles des autres services en cela que le soldat est essentiel à la réussite de la mission. L'armée équipe le soldat tandis que les autres services équipent en personnel le matériel. Au cours des dernières années, l'Armée a transformé sa doctrine et évolue vers une doctrine d'intégration. Cette approche a entraîné la communauté d'une diversité de plateformes, des technologies de l'ère de l'information, des logiciels et du matériel informatique. L'armée est résolue à éclaircir son avenir. Par conséquent, elle s'efforce d'établir une stratégie de fournisseurs nationaux qui appuient l'approvisionnement en matériel de l'armée pour les 10 prochaines années. L'armée ne dépend que de quelques décisions pour mener à bien son plan d'acquisition.*

The Nature of Army Acquisition

In addition to being shaped by the factors described in the opening chapter, land force acquisition must take cognizance of the special nature of the Canadian Army's situation. Three realities shape it:

- army commanders extol the value of the soldier and view the soldier as being central to mission success;
- real-time situational awareness, the capacity to respond quickly, and the means to achieve this command zenith are bringing about the doctrine of "integration"; and,
- the soldier is one of the greatest critics of military equipment and modern communication technology. This allows him to enter the equipment acquisition debate at the outset.

Soldier-Centric – It has been said that the Army equips the soldier whereas the other services (the Navy and the Air Force) man the equipment. The soldier is the most important asset of land combat, especially in this era of asymmetric warfare in urban terrain. As a result, the nature of army equipment is, for the most part, the assemblage of many relatively inexpensive items in support of soldiers rather than major weapon systems. It is the human-equipment interface and the integration of many components that render land force acquisition complex.

The ongoing Clothe the Soldier project is illustrative. This multi-million dollar project serves to enhance every soldier's performance through the acquisition of many items of clothing, load carrying and protective apparel. Many suppliers not routinely associated with the full range of soldier's equipment do not appreciate its complexity. The successful integration and interface of the 20-plus items that is achieved during soldier trials can easily be undone when suppliers optimize production of their item without consideration of the whole system. Complex soldier systems require performance objectives and specifications to ensure the delivered items do not create additional hazards. For example, experience has taught that modern textiles, when optimized for one performance objective (such as cold weather), can create static electricity hazards. Likewise, protective vests optimized for ballistic protection limit a soldier's movement. Supervision of products and constant liaison with manufactures is a hallmark of soldier-centric projects. The desire to spread the acquisition of many items amongst several suppliers needs to be tempered with the cost of post-delivery integration.

Doctrine of Integration – The Canadian Army is in a long period of transformation that started in the 1990s and is likely to continue well into the next decade. The central theme of this transformation is the reduction and integration of combat activity to five operational functions that better combine military capabilities. The long-term objective is the integration of all functions into one structure:

For the Future Army, [the operational functions of] *Command, Sense, Act, Shield and Sustain* will be integrated within a single structure. The focus will be on integration rather than on co-location. The operational functions, with Command as the nexus, will form a battlefield operating system.... The integration of capabilities into continua stretching from the strategic to the tactical level will be most prevalent within the functions of *Sense, Shield and Sustain*.⁹

Although armour and infantry units are likely to retain their identities, the relationship between manoeuvre, firepower and information continues to evolve, becoming increasingly integrated and inter-dependant. Within a few years the equipment found in armour and infantry units will have a high commonality, if not be nearly identical. The 8X8 wheeled, Light Armoured Vehicle (LAV) chassis already provides a common platform for all armour and infantry fighting vehicles. The products of the billion-dollar Tactical Command, Control & Communication System (TCCCS) project of the 1990s have established commonality in headquarters, intelligence and reconnaissance.

Combat power is becoming more the product (synergy) of the integration of capabilities. As a result new equipment is assessed more by its contribution to the whole than by its relative performance to like-equipment in its class. Decisions taken last decade led to greater integration, such as the adoption of a common 8X8 chassis, TCCCS and the electronic and command protocols that underpin the Intelligence Surveillance Target Acquisition and Reconnaissance (ISTAR) architecture. These decisions will dominate army acquisition out to 2020. The effect is that DND and Canadian industry have, for the most part, already determined the national acquisition strategy for current and future Land Force capabilities.

Soldier as Critic – The third principle that is likely to shape army acquisition is the experience of those serving. Government attempts to establish truck manufacturing plants in Quebec, Ontario and British Columbia have proven commercially unsuccessful and have left the Department of National Defence with expensive-to-maintain truck fleets (to say nothing of the soldiers' criticism of some trucks). The positive side of this experience is that the life cycle managers

⁹ *Future Army Capabilities* (DND, January 2001).

and others have 30 years of cost data on manufacturing and operating Canadian (built under licence) light, medium, and heavy military trucks. Senior officers and officials are now well positioned to provide accurate cost options to government. Given the immense database publicly available through access to information (ATI) and Treasury Board guidelines, it would be increasingly difficult to justify the manufactured-in-Canada (under licence) option. Governments prefer not to be the butt of the media inflammatory headlines such as “Government spends \$800,000 on a truck that others buy for \$150,000”.

On the other hand, experience has created a favourable climate of cooperation in several regions of the country. Defence Research and Development Canada and high-tech companies in the National Capital Region have built world-class military information architectures, and imagery and data fusion systems. The Kelowna-based protective ensemble expertise is sought by allied armies and their special forces. The success and reliability of the Swiss-Canadian LAV III has established Ontario as a premier manufacturer of light to medium armoured vehicles. The army is likely to continue to acquire soldier systems, information technology, and light to medium armoured vehicles from established Canadian sources.

Procurement by Operational Function

As seen above, the Army uses the generic terms of *Command, Sense, Act, Shield and Sustain* to guide the integration of military capabilities within a single structure.

Command – Command is the centre of all activities, integrating the other four operational functions toward the attainment of specific goals. Information technology facilitates a comprehensive understanding of mission, environment and forces, the use of which results in dynamic and accelerated mission command.

As previously mentioned, most of the procurement decisions that have brought into existence today’s command and communication architecture have already been taken. Canadian industrial expertise in command, control, communications and computers has built the current army command capability that, with upgrades, should serve until 2020. Attention has now shifted to command support, especially the enhancement and integration of data flowing from sensors to commanders.

Sense – The reconnaissance assets of the Army best illustrate the function of sensing. Several years of operational experience with Canadian and allied sensors have brought the Army into an enviable position. The Coyote reconnaissance vehicle, with its mast of sensors and the recently acquired tactical Unmanned Aerial Vehicles (UAV), provides a stream of imagery to command posts. The implementation phase of the ISTAR project circa 2007-2009 is being further refined by recent trials and experience with the integration of tiered UAV: formation-level for dimensional orientation; unit-level for situational awareness; and vehicle-level (dedicated UAV sensor feed to one vehicle) for target interrogation. Given the involvement of several Canadian companies and Canadian based international corporations, the likely suppliers of ISTAR are well known.

Canada and the Army are likely to be the beneficiaries of experience on international operations and investments in defence research and development. Due to its ability to adapt quickly and the expertise of its technical staff, the Canadian Army is well positioned to field a *Sense* capability – ISTAR – that will be sought by many. One Canadian electronics company has already won contracts worth more than a billion dollars as a result of the Army fielding high-tech communications. *Sense* is a Canadian initiative that is a jewel in the national acquisition strategy. The temptation to re-locate the Canadian centres of *Sense* expertise in order to stimulate economic activity in low-tech areas is the major threat to this success story.

Act – An army must do more than command information; there needs to be the capability to act upon knowledge. *Act* is that component of the structure that physically or morally affects the situation. It is fundamentality manoeuvrist in design, and presumes precision in application. Most see the *Act* function as represented by soldiers on foot patrol, armoured vehicles on reconnaissance missions, and artillery firing on distant targets. Within the operational function of *Act*, the capital projects of most interest are the Integrated Soldier System, the Mobile Gun System, and the Multi Mission Effects Vehicles. All of these projects are either at a mature definition or early implementation stage.

The Integrated Soldier System has been well researched by the human science hub at Defence Research and Development Canada in Toronto. DRDC Toronto has provided many Canadian and North American companies with the expertise of human science to the integration of soldier electronics, weapon accessories and apparel suited for peace support operations. Again, Canada and the Army are poised to reap the benefits of their vision and investment.

The Mobile Gun System (MGS) and Multi Mission Effects Vehicle (MMEV) are based on the LAV III 8X8 chassis made in London, Ontario. The issue of the

direct fire capability, range and rate, gun or missile has now been subcontracted to a Canadian prime contractor in Quebec. Value for money is a serious factor in this project. Canada's solution will be in direct competition with several other world class companies. If the Canadian Forces cannot afford the life cycle costs of the current Air Defence Anti Armour (ADATS) solution, a similar approach on a different chassis may not be competitive when the Treasury Board acquisition criteria for life-cycle costs are applied. After an expenditure of \$200 million to define the solution, there may not be adequate funds in the project to acquire the solution. Light armoured fighting vehicles that cost more than \$20 million apiece are twice the cost of main battle tanks. A light armoured MMEV that offers marginal performance over the LAV III might not secure command approval. The search for an affordable, protected, mobile, direct fire vehicle to replace the Leopard C2 and ADATS may eventually require looking elsewhere. The Canadian acquisition strategy for MMEV and MGS is likely to come under scrutiny.

Shield – This operational function, for the most part, has already been integrated and specified as protection requirements in the other four operational functions. There are no stand-alone large acquisitions to meet the *Shield* function.

Sustain – The easiest *Sustain* project to identify is that directly related to force generation — the Canadian Manoeuvre Training Centre. This project, based at CFB Wainwright, Alberta, provides simulated battlefield conditions for collective training at the unit-level (650 soldiers). The three test phases were accomplished in 2004-2005 and the facility is quickly becoming the means to prepare units prior to deployment.

Sustaining units also requires tactical lift, the bulk of which is provided by trucks. The Army historically has provided the project leadership for truck replacement, as it is the largest user of this type of tactical lift. However as the new Canadian Forces command structure matures, it is likely that truck replacement will move to a directorate of joint support requirements. In any event, the aging truck fleets are proving to be more expensive to maintain than replace. The Medium Load Vehicle Wheeled (MLVW) is now 25 years old and will cost on average \$40,000 per vehicle per year to sustain from 2005-2015.

Historically the national acquisition strategy for truck replacement has been to build a manufacturing-under-licence plant in Canada. This approach has not been commercially successful; neither has it always been militarily successful. Invariably, shortly after the delivery of the last truck, the plant and the vehicle expertise depart Canada. The departmental truck fleet managers are then forced to pay non-competitive prices for spare parts and technical knowledge from the Original Equipment Manufacturer (OEM). The OEM is not much interested in

solving special-to-Canada problems, such as operating a European designed truck in a Winnipeg winter, and as a result soldiers lose confidence in one of their prime load carriers.

Conclusion

From a national acquisition perspective, the Canadian Army has jumped over most hurdles. The doctrine of integration is bringing commonality to hardware and software, and in the process it is making acquisition less complex. Decisions taken in the last several years have already determined most parameters for acquiring army equipment. Aside from the direct fire solution and truck replacement, few major acquisition decisions will need to be made in the next ten years. The Army's high-value, short-production-time equipments should demand procurement logistic-cooperation solutions, ideally with close allies such as the United States. Canada's financial success in wheeled armoured vehicles and military communication technology, when viewed through the trade surplus lens, should generate reciprocal acquisitions with implicated allies.

Chapter 5

Air Force Acquisition

Le processus d'acquisition de la Force aérienne

Paul Manson

Abstract: *Air force acquisition is characterized by relatively high cost and very long life systems. Canada does not attempt to maintain a full spectrum of airpower, but the current and longer term strategic scene dictates the need for maintaining certain core capabilities, namely control of the air, strategic airlift, tactical airlift, helicopter battlefield mobility, shipborne helicopter operations, strategic intelligence, surveillance and reconnaissance, and tactical air reconnaissance. Although not critical to future operations, there are benefits also in maintaining the quasi-military roles of search and rescue, Snowbirds, humanitarian assistance and VIP transport. Delays in aircraft procurement, in large measure the result of a dysfunctional acquisition system, have led to serious aging and the urgent need for acquiring certain key fleets. Although offshore, off-the-shelf procurement is the norm, the federal government should make maximum use of Canada's substantial aerospace industry to participate in these programs, thereby ensuring a viable life cycle support base for the new fleets and a thriving industry. A national industrial strategy for defence procurement is essential.*

Résumé: *Le processus d'acquisition de la Force aérienne se caractérise par des coûts relativement élevés et l'extrême durabilité des systèmes. Le Canada n'essaie pas de maintenir un large échantillon de puissance aérienne; cependant, l'argument stratégique présent et à long terme impose le besoin de maintenir certaines capacités fondamentales, notamment le contrôle aérien, le transport aérien stratégique, le transport aérien tactique, la mobilité opérationnelle des hélicoptères, les opérations des hélicoptères embarqués, le renseignement, la surveillance et la reconnaissance stratégiques, et la reconnaissance aérienne stratégique. Bien qu'ils ne soient pas essentiels aux opérations futures, il faudrait également maintenir les rôles quasi-militaires de recherche et sauvetage, les Snowbirds, l'aide humanitaire et le transport VIP. Les retards en approvisionnement d'aéronefs, qui sont dans une large mesure le produit d'un système d'acquisition désorganisé, ont causé un vieillissement grave du matériel et un besoin pressant d'acquérir des flottes d'aéronefs essentiels. Bien que les achats faits à l'étranger de produits disponibles dans le commerce représentent la norme, le gouvernement fédéral devrait profiter au maximum de l'important secteur aérospatial canadien pour participer à ces*

programmes; il assurera ainsi une base viable qui soutiendra la durée de vie du matériel des nouvelles flottes et une industrie florissante. Il est essentiel d'adopter une stratégie industrielle nationale pour l'acquisition de matériel dans le secteur de la défense.

Introduction

Two related factors characterize the acquisition of aircraft and other major capital systems for the Air Force. The first is that the equipment, and therefore the acquisition process, is especially complex. Second, it is expensive.

These usually mean that air force capital programs are “big-ticket” items and thus prone to controversy, intense competition and resistance to decision-making. In consequence, change in the make-up of the Air Force’s inventory of major equipment does not come easily. On one hand, it builds on what it has to the greatest extent possible. On the other hand, the high cost of procurement is mitigated by extraordinarily long service life (note, for example, the Sea King and the C-130 Hercules fleets that entered service in the 1960s, and the CF-18s in the early 1980s).

Canada’s Air Force is small. Once (at the end of the Second World War) the world’s fourth largest, it has gradually shrunk to the point where it currently has fewer than 100 fighters, a diminishing fleet of ancient transport aircraft, 40-year old maritime helicopters, and 18 maritime patrol aircraft greatly in need of updating. Few aircraft in the current inventory can be called reasonably modern.

Since 1945 Canada has not attempted to maintain a full spectrum of airpower, having gradually eschewed such capabilities as heavy bombers, aircraft carriers, strategic reconnaissance, strategic airlift, helicopter gunships and medium/heavy lift helicopters. Over the postwar years, although the basic air roles have been relatively stable, changing circumstances at the strategic and tactical level have occasionally led to alterations in the available array of capabilities. Indeed, the remarkable shifts in the global scene since 1990, and the transformational response of military forces in the West, seem to indicate that changes to the roles and missions of Canada’s air force may well be necessary at this juncture. Although it is beyond the scope of this chapter to provide a definitive answer to this complex question, certain rational conclusions can be drawn, as will be seen below.

There is an important industrial dimension to the equation. In the 1950s and 1960s the RCAF ambitiously encouraged the domestic design and manufacture

of military aircraft. With the demise of the Avro Arrow project, for obvious reasons this gave way gradually to the acquisition of foreign designs built under license in Canada, through to the current common practice of buying aircraft off-the-shelf from foreign suppliers. However, because there is a viable aerospace industry in this country, one that focuses on high-tech systems and services in niche markets, air force procurement should take advantage of domestic sources wherever practicable, to the mutual advantage of DND and Canadian industry.

Present Situation

As a matter of practical reality, the starting point in assessing the acquisition needs of the Air Force is the current array of equipment holdings. Given the advanced age of several existing fleets, it is not surprising that these and the roles they serve are largely a legacy of the Cold War, as may be seen in Table 5-1.

Table 5-1: Existing Aircraft Fleets

| Capability | Aircraft | Number | Acquired | Est. End Life | Remarks |
|----------------------------|--|---------------|-------------------|----------------------|---|
| Air Superiority | CF-18 Hornet | 80 | 1982 | 2017 | 48 aircraft operational |
| Medium Airlift | CC-150 Polaris | 5 | 1993 | 2025 | Limited freight cap. 2 air refueller |
| Tactical Airlift | 1. C-130E 2. C-130H Hercules | 19 13 | 1964 1975-97 | 2010 2020 | 5 air refueller |
| Tactical Helicopter | CH-146 Griffon | 75 | 1995 | 2020 | |
| Maritime Helicopter | CH-124 Sea King | 27 | 1963 | 2005+ | To be replaced by 28 CH-149 Cyclone |
| Maritime Patrol | CP-140 Aurora | 16 | 1980 | 2015 | |
| Sovereignty Patrol | CP-140A Arcturus | 3 | 1991 | 2020+ | |
| Search & Rescue Fixed Wing | 1. C-130E 2. CC-115 Buffalo | 10 6 | 1964-97 1967 | 2010 u/k | From Tac Airlift |
| Search & Rescue Helicopter | CH-149 Cormorant | 15 | 2002 | 2020+ | |
| VIP/Utility Airlift | 1. CC-144 Challenger 2. CC-Twin Otter | 6 4 | 1982-2002 1970 | 2015 | |

This table is useful, also, as a concise review of the current roles and missions of the Air Force. Of particular note is the fact that some of the older aircraft in today's inventory were more or less designed for and limited to specific roles. Very importantly, also, Table 5-1 indicates that certain fleets are approaching the end of their service lives, and will therefore either have to be replaced soon or their missions be deleted. Brian MacDonald has observed that fully 71 per cent of major air platforms already are beyond the Treasury Board's definition of Life Expectancy.¹⁰

Factors Affecting Air Force Acquisition

The strategic scene has changed dramatically since the end of the Cold War, with the emergence of state-sponsored terrorism, the instability created by the existence of failed and failing states, the direct threat from Islamist terrorists, shifts in the international balance-of-power structure, environmental change, energy challenges, pandemics, and the inevitable surprises that the future always brings. In the face of this greatly altered strategic environment, the usefulness of airpower has to be reassessed, to ensure that it is employed by Canada to best advantage. Fortunately, an inherent quality of airpower is its flexibility; more and more, thanks to technological advance, aircraft and mission systems can be brought to bear effectively in a wide array of operational circumstances. The CF-18 Hornet, for example, has been employed in NATO Europe and in the Persian Gulf in both the air combat and ground attack roles, in NORAD as a counter to Soviet strategic bombers, in the Arctic to assert Canadian sovereignty, and as a deterrent and response to terrorist hijacking of airliners. There is an important lesson here: the Hornet was deliberately acquired as a multi-role aircraft. To the greatest extent possible, future air fleet acquisitions should reflect the same sort of multi-role flexibility. This need is all the greater, given the combination of long in-service life of modern military aircraft and the certain prospect of changing strategic requirements during that extended lifetime.

An interesting feature of modern air force systems is the increasing degree to which on-board equipment contributes to overall system effectiveness. More and more, the aircraft itself has become simply a platform for the carrying of very sophisticated high-tech systems, the effective life spans of which are considerably shorter than that of the aircraft (a consequence, of course, of the rapid pace of change of military systems technology). Systems upgrades, therefore, are the order of the day in many cases, with obvious cost advantages over complete aircraft replacement.

¹⁰ Brian MacDonald, "The Race with Rustout: Can we Close the Procurement Gap?," in *Royal Canadian Military Institute (RCMI) SITREP*, November-December 2005, p. 3; at http://www.rcmi.org/archives/sitrep_november_2005.pdf.

Strategic Requirements

It is not necessary to read (or write) a White Paper on Defence to understand what capabilities the Canadian Air Force will likely have to bring to bear in the decades ahead. Much thought has gone into this question both within and without the Department of National Defence, and the broad lines are generally understood. To be sure, there are capabilities that in all probability are beyond the reach of the Canadian Forces for either budgetary or policy reasons. Yet other capabilities may be rendered borderline or out of reach, depending upon available financial resources and competing priorities.

Here is a reasonable estimate of the aircraft mission requirements that should be met by the Air Force over the next several decades, more or less in order of priority.

1. Control of the Air – This is the original and fundamental use of military aircraft. Without “fighters” (a misnomer), there is no *force* in air force. Control of the overhead airspace is vital to the effective operations of army and naval formations in combat, and to the provision of tactical air support of these formations through ground and anti-ship attack, interdiction, and reconnaissance. At home, control of Canadian airspace is an essential requirement for defence against hostile incursions, whether by foreign nations or terrorists, and for the enforcement of national sovereignty.

2. Strategic Airlift – Recent operations have demonstrated the pressing need for assured access to very long range, large load capacity transport aircraft. Even North American operations frequently involve “strategic” distances, a fact that is too often missed. The need is all the more acute in overseas operations.

3. Tactical Airlift – Tactical transport aircraft are essential to the support of both domestic and global operations, for the initial rapid deployment of troops and equipment, and for sustaining in-theatre operations.

4. Helicopter Battlefield Mobility – The modern battlefield, in Afghanistan-type situations, demands a high degree of tactical mobility by land forces, as provided by light, medium and heavy lift helicopters.

5. Shipborne Helicopter Operations – Canada’s fleet of patrol frigates and support ships would lose much of their operational capability without a modern helicopter on-board. It is a vital element of the total weapon system.

6. Strategic Intelligence, Surveillance and Reconnaissance (ISR) – Canada, as a vast three-ocean nation with the world’s longest coastline and a sparsely populated northern region, needs the capability currently provided by the Aurora and Polaris fleets. Forecasts of global warming and related sovereignty challenges in the Arctic suggest that ISR will be increasingly important in the coming decades. Satellite-based surveillance should be considered as a complementary element of the system.

7. Tactical Air Reconnaissance – Unmanned Air Vehicles (UAVs) are increasingly useful in the so-called Three-Block War environment, as a means of securing fast tactical intelligence at minimal cost.

8. Search and Rescue – Although not strictly a military role, this has traditionally been carried out by the Canadian Forces with great skill and effectiveness.

9. Snowbirds – Canada’s world-renowned Air Demonstration Team does not provide a direct military capability, but its contribution to pride and morale cannot be discounted.

10. Humanitarian Assistance – This important and traditional role will in all likelihood be carried out by existing equipment, in that no major procurement could be considered for this role alone, if only for cost reasons. Nevertheless, the utility of CF airlift and helicopter resources in this role needs to be taken into account in future acquisition of these fleets.

11. VIP Transport – Again, this is a non-military role performed by the Canadian Air Force.

In addition to these aircraft-oriented missions, the Air Force will have to consider the retention or creation of a number of related capabilities having capital acquisition implications, but generally on a lesser scale than the aircraft systems mentioned above. These include long-range air surveillance radars, coastal radars, air traffic control systems, and communications systems, including space-based systems. Although not discussed in detail here, they are a part of the total acquisition picture.

Note also that flying training in Canada is a contracted-out operation. It is therefore not considered in this appraisal, even though it requires relatively modern aircraft.

Industrial Imperatives

Given the fact that defence acquisition can have a significant impact on the national and regional economies in this country, it is a matter of political necessity and practical reality that large capital expenditures be conducted in such a way as to bring substantial benefit to industry. At the same time, however, this requirement must not be allowed to override the essential needs of the Canadian Forces, either by adversely influencing the selection of equipment, or by unduly adding cost, risk and time to a given acquisition program. Achieving this delicate balance is not easy. Naturally enough, the Canadian aerospace industry seeks a share of the procurement dollar, either directly through involvement in the development, production and life cycle support of the system being acquired, or indirectly through offsets, especially those having high-tech content.

Much experience has been gained over the years in achieving a reasonable balance between the sometimes conflicting objectives of DND and the Canadian aerospace industry. Some real successes have been achieved: a number of companies owe their creation and continuing existence to Industrial Regional Benefits associated with major aircraft and system purchases. Even so, the absence of a national industrial strategy for defence procurement is a debilitating factor that can lead to conflict, interdepartmental wrangling and delay.

Recent attempts to create a viable national strategy need to be pursued so that all parties work from a common and open baseline. Because Canadian aircraft procurement now is generally limited to off-the-shelf purchases from foreign suppliers, any offset policy must be carefully defined early in the project definition process, and employed to best advantage.

There is another trend related to industry that needs to be pursued vigorously. The use of Performance-Based Requirements (PBR) by DND is essential if there is to be any hope in reducing procurement times. Given the great complexity of modern aircraft systems, the temptation to dictate design specifications to industry must be avoided. This being said, considerable effort is needed to produce a clear and unambiguous definition of the performance being sought, and the means by which options are to be evaluated.

Options For Canada

The principal determinant in sorting out the air acquisition picture is, of course, cost. Since the available defence budget is always finite, the acquisition of aircraft fleets not only has to be based on rational priorities within the Air Force, but important judgments also have to be made about air priorities relative to the

needs of the Army, Navy and support elements. Because the future will see “jointness” in CF operations to a degree never before encountered, every procurement decision must take into account the total picture. Similarly, decisions have to be made as to whether the Canadian capability in each case is to be stand-alone or dependent to some degree upon allied nation support.

On the matter of cost, it often happens that capital budget limitations preclude what would otherwise be more efficient solutions. For example, the early procurement of an aircraft fleet might well result in a lower long-term cost and greater operational effectiveness, yet these benefits would have to be foregone if sufficient near-term cash were not available. Similarly, a lease-to-buy option might be the only way to bring in the desired capability, even though this might be more expensive over the life cycle of the system.

These and other tough decisions will have to be made by defence planners and ultimately by the government, which might well have to consider a substantial “bump” in the capital budget, sooner rather than later because of the critical aging of certain aircraft fleets. What follows is a set of proposed decision rules that could be useful in the conduct of capital equipment acquisition for the Air Force over the next 10 to 15 years. These are arranged rather subjectively in their order of perceived importance. No attempt is made here to recommend specific solutions, such as to identify particular aircraft. That is the job of the Department of National Defence.

- **CF-18 Fleet** – The current upgrade program gives the Hornet fleet a substantial boost in effectiveness across a wide range of missions and roles, including interoperability with allied air forces. Although the recent decision to suspend the air-to-air ASRAAM missile acquisition will leave a capability void, the CF-18 upgrade program will keep the fleet in other respects operationally effective through to the end of its life around 2017. In the meantime, studies should be conducted to determine the best projected replacement option, including the Joint Strike Fighter (JSF). Eleven years is not a long time to prepare for this important decision. If history is any guide, the unit cost of high performance aircraft like the JSF and its contemporaries will escalate to the point where low-cost, lower-performance alternatives may also have to be considered. Suggestions that UAVs may supplant manned fighters altogether in air superiority roles by 2017 seem highly unlikely.
- **Airlift** – Strategic and tactical airlift must be considered together. In recent years budget constraints have led some to think in terms of “one or the other”, but to fall into this trap would be a serious mistake. The CF has an imperative requirement for both forms of military air transport. As it

happens, although the roles themselves are distinct, there are aircraft in the marketplace that have the potential for performing both missions effectively. Both the C-17 and A400M lay claim to the ability to deliver large, outside cargo loads over strategic distances, delivering personnel and material directly into the tactical battlefield environment. The cost-effectiveness of a single-fleet solution therefore deserves careful study. Furthermore, the recent practice (budget-induced) of leasing foreign strategic airlifters is an unsatisfactory solution. It presents the great risk to Canada of being low on the totem pole of bidders in times of greatest need, which at best would limit our operational response to crises, both domestic and international. Over the long term the cost of such a makeshift arrangement may well be greater than it would be for an outright purchase, depending upon such indeterminate factors as the frequency of operational incidents, reliability of suppliers, and leasing costs in the long term. To a lesser extent, the arguments against the leasing option can be invoked against the case that is sometimes made for a “pooling” solution. In this scenario, Canada would join allied air forces in a joint acquisition of strategic airlifters (in particular), thereby spreading the cost to some extent. Again, shared use in time of crisis would be problematical. Basing and maintenance problems can also be foreseen. All things considered, two options present themselves: the outright purchase of modest fleets of both strategic and tactical airlift aircraft; or the acquisition of a single fleet of strategic airlifters capable of performing both roles. Either option has the potential to give Canada the ability to play a reasonable role internationally, in addition to an assured and effective response to domestic crisis situations, whether of a military or non-military nature. The ultimate decision must be made on the basis of a rational comparison of key factors, including life-cycle cost. But the decision must be made soon.

- **Medium/Heavy Lift Helicopters** – Reliance on foreign (specifically American) helicopters in Afghanistan-type operations is severely limiting. The acquisition of approximately 15 medium/heavy lift helicopters is an urgent requirement. These should be responsive to the needs of forces operating in a combined maritime-land theatre as well as purely army operations. The changing threat picture also suggests that medium/heavy lift helicopters will be employed operationally in North America as well as in overseas hot spots. Their utility in humanitarian support operations must likewise not be overlooked, as witnessed in recent global episodes such as tsunamis, hurricanes, and earthquakes.

- **Maritime Helicopter** – The current program to replace the Sea King helicopters must proceed with all due haste. Any further delays in phasing out the Sea Kings would have serious implications for operational effectiveness, flight safety and fleet maintenance costs.
- **Fixed Wing Search and Rescue Aircraft** – The program to replace the Buffalo and Hercules in this role has been shamefully delayed. A new SAR aircraft needs to be selected quickly, if only to clear the way for other much-needed acquisitions.

Conclusion

Following through quickly on the programs described above will allow the Canadian Forces to perform effectively across the full range of operational undertakings foreseen in any likely defence policy statement. It will help to get rid of the dangerous backlog of much-needed upgrades of air assets that has build up over the last decade, and it will open the way for a rational, phased acquisition program in the longer term, thereby avoiding the fleet obsolescence problem that currently plagues the Canadian Forces.

To be sure, solving the problem will take a generous measure of political courage, quick analysis and teamwork within DND, government as a whole, and industry.

Failure to act will have dire consequences for Canada's ability to employ airpower effectively in meeting the tough challenges of the future.

Chapter 6 – Joint Acquisitions

Acquisitions interarmées

Brian MacDonald

Abstract: *Three critical factors will limit the ability of the new government to implement defence policies proposed during the election campaign. The first is the age of key equipments. For example, by the time the Joint Support Ships are completed their predecessors will be 47 years old – 17 years beyond the end of their life expectancy by Treasury Board standards. Second, is the speed of technological change and, according to the Auditor-General, “the likelihood of technology overtaking projects” if the current acquisition cycle cannot be speeded up. The third is the excruciatingly slow, 17-year procurement cycle. Alternatives to the cumbersome, slow moving, risk-averse acquisition system that has created intolerable levels of operational risk, must be found. Such alternatives might include a change to sole sourcing of replacements for major equipments past their life ends, as well as the restoration of the Department of Defence Production.*

Résumé: *Trois facteurs essentiels vont limiter la capacité du nouveau gouvernement de mettre en oeuvre les politiques de défense mises de l'avant au cours de a campagne électorale. Le premier est la vétusté d'équipements clés. Par exemple, d'ici à ce que les navires de soutien interarmées seront construits, leurs prédécesseurs auront 47 ans, soit 17 ans de plus que leur espérance de vie normale selon les critères du Conseil du Trésor. Deuxièmement, il y a la rapidité du changement technologique et, selon la Vérificatrice générale, il est fort probable que la technologie aura rattrapé le projet si le cycle actuel de 17 ans ne peut être accéléré. Le troisième facteur est le cycle d'approvisionnement de 17 ans qui est tout simplement trop lent. Il va falloir trouver une autre façon de gérer l'approvisionnement et se débarrasser d'un système lourd, lent, prudent à l'excès qui a suscité des niveaux de risque opérationnel intolérables. On peut songer au passage à l'approvisionnement de source unique pour le remplacement d'équipements qui ont déjà dépassé leur durée de vie utile, de même que le rétablissement du ministère de la Production de Défense.*

The Joint Acquisition Basket

The Capital Equipment Annex of the Canadian Forces' Strategic Capabilities Investment Plan (SCIP) was last updated publicly on 27 July 2004.¹¹ This is the document that lists strategic capital projects for which spending authority has not yet been given, but for which authority is being sought.

At that point there were three major areas for "joint" projects. The first was the Joint Support Ship project, with a forecast cost of \$1.97 billion. The second was a National Military Support Capability, "a Joint Support Group that will be staffed and equipped to provide support to CF deployed operations... capabilities to activate an operational theatre, to set up and take down camp infrastructure and to provide support to a deployed force of up to 1500 personnel" with a forecast cost of \$0.53 billion. The third was a group of smaller projects designed to provide the CF with a national surveillance, intelligence fusion, and national command and control system with a collective price tag of about \$1.1 billion, which otherwise went under the general rubric of "C4ISR" (Command and Control, Communications, Computing, Intelligence, Surveillance, and Reconnaissance).

The total Joint Acquisition bill thus came to approximately \$3.58 billion. Of this \$87 million was planned to be spent by 31 March 2006, \$520 million between 31 March 2006 and 31 March 2009, and the remaining \$3 billion after 31 March 2009. This represents about 6.5 per cent of the total planned capital spending after 31 March 2009, for which authority was being sought.

Presumably this Strategic Capabilities Investment Plan will be updated once the new government consults with senior department officials; however, we can draw some useful insights from the existing plan.

The Blinding Flash of the Obvious

Three critical factors will limit the ability of the new government to actually implement the new defence policies that were proposed during the election campaign. All can be seen clearly in the equipment proposals made with respect to joint capabilities. They are, first the age of key capabilities that have to be replaced. This means that the new government has very little time to act before key elements of the department simply grind to a halt, since their equipment cannot be made to function any longer. The Joint Support Ship project provides a good mini-case study of this, as will be discussed in detail below.

¹¹http://www.vcds.forces.gc.ca/dgsp/pubs/rep-pub/ddm/scip/annex04-05/intro_e.asp

Second is the impact of the shortness of the technology cycle, compounded by the massive United States investment in new network-centric systems that have proved to be such effective force multipliers in the Afghan campaign, and again in the second Iraq campaign. This means that the new government has frighteningly little time to act before the ability of the Canadian Forces to remain interoperable with their United States and NATO counterparts simply disappears. The set of “C4ISR” projects related to national surveillance, intelligence fusion, and national command and control thus provides the mini-case study (also discussed further below) of the task of coping with the velocity of the technology cycle — what we might think of as Clausewitz’s concept of “friction” in reverse.

And third is the uneasy hand of a ponderous acquisition system whose lethargy spans vastly beyond the very narrow time window that the new government has to avoid catastrophic failure of the Canadian National Security System. The fact of a procurement cycle of 15 years or more, facing a technology cycle of 5 years or less, is simply impossible to cope with.

The Sorry Saga of the AOR/ALSC/JSS Project

This classic Canadian defence acquisition story began with the need to replace the Navy’s three Auxiliary Oiler and Replenishment (AOR) ships — vessels that carry the extra fuel and supplies required to keep a Naval Task Group at sea for extended periods. Commissioned respectively in 1964, 1968, and 1970, they should have been replaced in the 1994 to 1999 time frame, when they reached the end of their Canadian Navy 30-year service life, that being the life expectancy set forth in the JSS project System Requirement Document,¹² itself five years longer than the life expectancy determined by the Canadian Treasury Board.¹³ That they were not replaced on schedule was the consequence of the effective end of the Cold War in 1987, and the subsequent period of general disarmament, which in Canada extended in the Dandurand tradition (“Canada lives in a fireproof house”) even beyond the reality of 11 September 2001. This period of Canadian general disarmament saw the defence budget halved from 2.2 per cent of GDP in 1987, to 1.1 per cent of GDP in 2005. It saw an even sharper slashing of the defence equipment share of the budget, from 20 per cent in 1987, to 8.2 per cent of the emaciated defence budget in 1999 — a de facto cut of 75 per cent in the defence capital budget in that period.¹⁴

¹² DND, SRD-499, JSS System Requirement Document (16 January 2006);

http://www.forces.gc.ca/admmat/dgme/pm/pmojss/docs_presentations/SRD_PD_SOW_e.asp

¹³ Treasury Board of Canada Secretariat, *Treasury Board Accounting Standard 3.1 - Capital Assets: Amortization of Capital Assets* (2004);

http://www.tbssct.gc.ca/pubs_pol/dcgpubs/acstd/capasset1_e.asp#_Toc510490914

¹⁴ NATO, “NATO-Russia compendium of Financial and Economic Data relating to Defence: Defence Expenditures of NRC Countries (1980-2004)” (2005);

<http://www.nato.int/docu/pr/2005/p050609e.htm>

While it can certainly be rationalized that the AORs were not replaced in a period when there were far too many high priority defence re-capitalization projects chasing far too few defence capital equipment budget dollars, that does not alter the fact that the AORs had passed, like so many other critical Canadian defence capability platforms, beyond the end of their effective service lives. It was critical, therefore, that, when money finally became available in the defence budget, the defence capital procurement process be accelerated in order to get the AOR replacement ships into operation and at sea as quickly as possible.

In the long dark night of the defence capability “rustout decade,” if we may borrow former Defence Minister Perrin Beatty’s colourful term for a similar earlier period, the Navy AOR project morphed into the “joint” Afloat Logistics and Sealift Capability (ALSC) project, which intended to add a second capability to the replacement AORs in providing sealift for army equipment, in a modern day echo of the dual-use practice that had been proven when the Navy still had an aircraft carrier during the early “peacekeeping” years (those vessels then in service were employed to transport equipment variously to Suez in 1957 and Cyprus in 1964). Later, the ALSC project morphed into the JSS project, a semantic change that had essentially the same set of dual objectives, but also entailed additional afloat joint headquarters and hospital ship capabilities.

The long, sad saga of the AOR/ALSC/JSS project (see Table 6-1) seemed finally to be on the verge of realization with the announcement in November 2004 that Preliminary Project Approval (PPA) for the project had been granted by Treasury Board. But, as the expression goes, “the devil is in the details,” for we discovered from the project schedule¹⁵ that the planned procurement process would take yet another 9 years before the CF would be able to finally achieve the Initial Operating Capability (IOC) of the new ships in 2013. The IOC represents the point at which the first JSS is able to actually go to sea, with a well-trained crew, and do its operational (can we say “wartime”?) job of replenishing a naval task group and / or transporting an army company-group’s worth of equipment to wherever it had been ordered to go.

¹⁵ http://www.forces.gc.ca/admmat/dgmepm/pmojss/schedule_e.asp

Table 6-1: AOR/ALSC/JSS Timelines

| Event | Year | Age | Life Remaining |
|--|-------------|------------|-----------------------|
| <i>HMCS Protecteur</i> commissioned | 1969 | 0 | 30 |
| <i>HMCS Protecteur</i> life end | 1999 | 30 | 0 |
| Preliminary Project Approval (PPA) | 2004 | 35 | -5 |
| Letter Of Interest Announcement | Feb 2005 | 36 | -6 |
| Pre-Qualification of Potential Bidders | Spring 2005 | 36 | -6 |
| Request for Proposals | Summer 2005 | 36 | -6 |
| Project Definition Contract (to the two finalists) | 2006 | 37 | -7 |
| Effective Project Approval (EPA) Final Contract Signed | 2008 | 39 | -9 |
| Delivery of Initial Ship | 2012 | 43 | -13 |
| Initial Operating Capability | 2013 | 44 | -14 |
| Project Complete | 2016 | 47 | -17 |

“Let us praise famous men,” as another expression goes, and observe as well that, if all goes according to plan (not an assured proposition), “In the Year of Our Lord, 2013,” Her Majesty’s Canadian Ship *Protecteur* will be 44 years old, 14 years beyond the end of her service life by Canadian Navy standards, or 19 years beyond the end of her service life by Canadian Treasury Board standards.

Somehow, we have to do better than this.

The Uneasy Hand of Risk Management

If this were a paper written as a case study for the MBA schools, it might begin by drawing on the rich academic literature available in both economics and organizational behaviour disciplines to describe the Canadian procurement system as a prime example of the operation of “intended rationality” – of government systems designed to produce an optimal solution that would deliver “best value for money,” while at the same time minimizing risk through successful “risk management” practices.

Then it might counter-pose the concept, drawn from those same two disciplines, of “bounded rationality” – the idea that not all factors impacting on the decision may be known and included in the decision model adopted by those pursuing that “intended rationality.” It might pose the idea that we are not making decisions under conditions of certainty or even “risk” (which as a technical term describes a condition in which we can estimate the statistical probabilities of outcomes), but rather under conditions of “uncertainty” (in which we have little capability of estimating the probabilities of outcomes).

It might suggest, therefore, the supplement of additional factors such as the “search costs” inherent in the time spent looking for alternative outcomes, or the “calculation costs” of the time spent in drafting complex decision algorithms, with appropriate factor weightings (including those for the industrial and regional benefits so dear to the hearts of the Canadian political classes). It might also note the impact of the “loss of capability costs” when antique military platforms are waiting restoration before they can be put to use, while at the same time a lengthy “optimization” model is being worked out to the satisfaction of its practitioners.

Moreover, it is entirely probable that, while this lengthy “intendedly rational” process was slowly progressing towards its end, a number of unanticipated exogenous factors might suddenly intervene and throw the optimization process into disarray, and require it to be started all over again. Need we remind ourselves that, when technological changes are driving factors, this probability rises sharply?

The economics and organizational behaviour case study might then refer to an alternate decision model, which is actually used in the real world every day by ordinary folks as they go about their daily tasks, particularly when uncertainty rules their environment. Nobel Laureate in Economics Herbert Simon, whose honour was granted in recognition of his work on decision-making in organizations, described this alternative model of rational decision making under uncertainty with the term “satisficing” (from “satisfying” and “sufficing”). This is a

decision model that says, in effect, sometimes it makes much more sense to set an appropriate minimum standard, and then take the first acceptable solution that comes along, because this will save both search and computation costs, and – most critically important of all — it will save time.¹⁶

The “intended rationality” of the current Canadian government acquisition decision model attempts to minimize risk. In this sense, however, “risk” usually seems to focus on a variety of fiduciary factors: the financial risk of contract overruns; the contract risk involved in contractors not meeting contract specifications; the political risk involved in procurement decisions that have embarrassing consequences for politicians by their presence on the front pages of national media; or the attempt to shift “risk management” costs to contractors by means of long term (30 years in the case of the JSS project) contracts without seeming to consider that one obvious “own risk management” tool for contractors in such circumstances is to simply increase contract bid prices.

What seems less apparent, in the Canadian government decision model, is a willingness to accept the existence of “operational risk”—the risk that a critical capabilities platform won’t be able to do its job, especially under adverse conditions (can we use that decidedly politically incorrect phrase “wartime” again?), because it is simply too old physically, and/or its critical technologies are too out of date, and therefore the platform becomes of greater danger to its crew than to any possible enemy.

Sadly, we seem to have even come to a tendency for the proponents of the government “intendedly rational” decision model to discount the “professional judgement” of experienced military officers. The MBA schools, drawing again on the rich decision-making literature of the economics and organizational behaviour disciplines, might point out the extent to which the “Delphi Model” (based upon successive feedback iterations of expert knowledge), produces decision outcomes of great robustness, and might well wonder why such military professional experience, particularly when it is advanced by officers who have actually been shot at, is discounted so easily.

C4ISR and the Management of Change

The Canadian media made a great deal of mischief with the 2002 Auditor General’s Report titled “Military satellite communication system is unused and placed in storage.” A closer read of the Auditor-General’s report suggests that

¹⁶ H. Simon, “Theories of Decision-Making in Economics and Behavioral Science,” *American Economic Review*, XLIX:3 (1959), pp. 253-283.

the initial spin was, perhaps, a little less accurate than it seemed at the time. The report began with the statement that:

In 1991 National Defence contracted for a military very long-range communication system (VLRCS) to provide satellite communications to deployed forces. This system was completed in 1997-98 at a cost of \$174 million. While it was being developed, National Defence purchased and leased commercial equipment to satisfy immediate international peacekeeping requirements. By the time the VLRCS was delivered, the Department regarded the commercial system as an alternative to the VLRCS. Furthermore, the VLRCS required an additional 50 people to operate it and an additional \$15 million to bring it to current technical standards. National Defence therefore took delivery of the VLRCS but placed it in storage, where it remains.¹⁷

While the Auditor-General was critical of the internal processes within the Department concerning the management of the project, it also recognized the impact of two unexpected exogenous factors:

One was the changing strategic environment, which led to overseas deployments in peacekeeping operations as opposed to war fighting, and therefore lessened the demand for mobile, hardened military systems. The other factor was the dramatic cuts in budgets and personnel that occurred throughout the mid-1990s. As a direct result of these cuts, the Information Management Group decided not to field the gateway component of the system because of the requirement for 50 people to operate the equipment.¹⁸

The Auditor-General further observed that “The Department learned a number of lessons, especially involving the management of high-technology projects,” and felt that the process changes subsequently implemented by the Department “also reduces the likelihood of technology overtaking projects....”

The Auditor-General returned to the assessment of the Department’s approach to technology management in the April 2005 report titled “National Defence — C4ISR Initiative in Support of Command and Control.”¹⁹ While the report was generally approving with regard to the processes undertaken by the Department, it made a number of specific comments as to the way in which the Department was managing the C4ISR initiative:

¹⁷ <http://www.oag-bvg.gc.ca/domino/reports.nsf/html/0208ce.html#ch8hd3d>

¹⁸ Ibid, para 8.59.

¹⁹ <http://www.oag-bvg.gc.ca/domino/reports.nsf/html/20050404ce.html>

The C4ISR initiative that the Department is pursuing is the result of its assessment of critical command and control capability deficiencies, which it recognizes must be addressed. To ensure that it achieves its goal of providing commanders with decision-quality information when they need it, the Department wants to have fully integrated and interoperable command and control systems by 2008. If the Department is to achieve this timeline, there are some barriers to C4ISR implementation that it must resolve soon.

Among these barriers was that

Funding for C4ISR projects will have to compete with other capital budget priorities. The Department has identified priorities and planned its capital spending, but plans exceed budget availability. These funding pressures put these projects at risk.

The Auditor-General identified these risks when

We reviewed the planned spending for 91 projects that National Defence identified as a baseline for planning and implementing its C4ISR transformation. We estimate that expenditures related to C4ISR could total approximately \$9.7 billion, of which about \$4 billion has been expended to date and a further \$5.7 billion in spending is planned by the Department over the next 10 years. In some years, annual spending for C4ISR will reach as much as 40 percent of the funding available in the capital equipment budget.

What becomes quickly apparent to readers of the full Auditor-General's report is the very high operational risk to these joint projects should they be delayed, because of either the failure of government to fund them adequately, or the failure of the procurement system to move quickly enough to avoid "the likelihood of technology overtaking projects."

Some Conclusions

What stands out in both of our joint acquisition mini-case studies is the criticality of time, a criticality that is not restricted to the Department's joint acquisition area alone.

Taken with this is the time delay imposed by an "intended rationality" acquisition process pursuing, as best it knows how, the normally laudable objectives of a competitive bidding process that allows for transparency, fairness to bidders, the

achievement of secondary aims related to industrial and regional benefits, and value for money, all while minimizing risk.

Unfortunately, the cost of all this “intended rationality” is the very real danger of system collapse, as capability after capability drops off the table through failure to be replaced on time – even when the money is there (as in the curious case of the inability to generate the mandated Fixed Wing SAR project), or as new transformational capabilities simply are not able to come on line quickly enough.

Perhaps, because of the criticality of time, it now makes increasing sense to adopt Herbert Simon’s satisficing strategy as the *de facto* model for defence acquisition and to adopt, as a satisficing model, the recommendation made elsewhere in this volume: “Buy off-the-shelf from Canadian sources. If not available in Canada, buy off-the-shelf from foreign sources.” To this could be added, as the Chief of Defence Staff attempted to do before the election, the use of the National Security Exemption, which allows the override of the competition provisions of the WTO, NAFTA, and AIT trade agreements, and to go to directed, sole-source procurement to fill the airlift needs.

Perhaps, too, it is time to question the very rationale of “competitive bidding.” A recent article in *Industry Week*²⁰ examines the comparative results of the Toyota production system and the Ford/General Motors relationship with their suppliers. It notes that the latter relationship has a strong zero-sum game flavour, with “across-the-board mandates at large OEMs (Original Equipment Manufacturers) that push pressure for cost-cutting disproportionately onto suppliers’ shoulders,” and an accompanying threat of discarding suppliers in cutthroat competitive-bidding processes. “Toyota’s supplier collaboration,” on the other hand, with “pre-production collaboration – two to three years before the launch of a vehicle – centres on identifying and solving potential problems to the mutual benefit of both parties” and demonstrates that sole-sourcing is a critical element of the success of the Toyota production system. It seems difficult, given the changes in market share in North America between the three firms, to argue that Toyota’s sole sourcing, supplier collaboration model is wrong.

Perhaps it is also time to re-examine the system put in place in the early 1950s by Brook Claxton and C.D. Howe, following a similar period of general disarmament that also turned out to be premature. That period required, as now, a massive re-capitalization of National Defence in Canada in a critically short timeframe. The solution was called the Department of Defence Production, whose primary focus was the provision of the physical instruments of National

²⁰ John Teresko, “Learning From Toyota – Again.” in *Industry Week*, February 2006; <http://www.industryweek.com/ReadArticle.aspx?ArticleID=11301>

Security, and its relationship with the Canadian defence industry looked a very great deal like the focus of the Toyota production system on supplier collaboration.

We have very little time left in which to fix the defence re-capitalization crisis before we arrive at system collapse. Critical times require critical solutions. The CDS' instinct is right — the current system is wrong.

Conclusion: A Defence Acquisition Strategy Template Un modèle d'acquisition

Richard H. Gimblett

Abstract: *This inaugural monograph in the Vimy Papers has endeavoured to set out a comprehensive picture of the crisis in defence acquisition in Canada today. More importantly, it presents considered ways to resolve the crisis; hence its title, **Creating An Acquisition Model That Delivers.***

Résumé: *Cette première monographie dans la série des Cahiers Vimy s'efforce de fournir une vue d'ensemble de la crise que travers de nos jours l'approvisionnement d'équipements de défense au Canada. Plus significatif encore, ce mémoire propose des façons réfléchies de résoudre la crise. D'où le titre : **La Création d'un modèle d'acquisition qui donne des résultats.***

The opening chapter, written by Paul Manson and Howard Marsh, set the context of the problem. Long deterioration has brought Canada's military to a critical stage. Equipment must be replaced now or present operations will be severely restricted. Governments have deferred decisions for too long. Should operational imperatives have prominence, the existing procurement system that favours Canadian industrial participation may, in the short-term, exclude Canadian industrial and regional solutions. The government is in an unenviable position. The current lengthy procurement approach could, on one hand, deny the military and favour industry; on the other hand, it could deny Canadian industry the opportunity to rebuild the military. The procurement process has inter- and intra-departmental paths, as well as partial and full industrial participation. The imperative to find an alternative that satisfies all requires strong leadership and innovative leadership at this late hour.

The second chapter, written by Pierre Lagueux, begins by identifying five core objectives that any acquisition strategy must satisfy to ensure a more consistent and timely outcome. These objectives are not unique to Canada, but tend to be universally accepted, although perhaps unevenly managed, in most western Defence Departments:

- the CF must receive equipment that meets their approved and defined operational requirements;
- acquisitions must proceed in timely manner;
- value for money must be obtained;
- risk must be equitably managed; and,
- government's ability to lever defence procurements to achieve other objectives must be facilitated.

From these, he developed a number of key attributes that should define a Defence Acquisition Strategy (depicted on these pages) that respects the previously discussed core objectives. While many of the recommendations focus on internal Department of Defence processes, they also touch on issues that cross-departmental boundaries and impact on how industry responds to requirements. If implemented, significant benefits in terms of timeliness and predictability will accrue to all parties involved in defence acquisition.

Armed with Mr Lagueux's ten attributes that should define a defence acquisition strategy, the authors of the four subsequent chapters applied these principles to naval shipbuilding, air force acquisition, army systems, and joint acquisition. Together, they support the contention that the lack of a coherent, national military equipment acquisition strategy is the Achilles Heel of existing procurement procedures and the single most important impediment to transforming and modernizing the Canadian Forces. Politicians need a decision-making template without which efforts to balance regional industrial aspirations and military requirements could result in denying Canada's military the capabilities they so desperately need and burden the country and the military with inefficient outcomes.

Waiting for decisions and paying too much for military equipment may well result in the Canadian Forces consisting of three relatively ineffective services or foregoing one of their current three services. Neither of these results is acceptable to Canadians.

But fixing the system, although necessary, is not sufficient. It must quickly be put to work to resolve the distressing state of the Canadian Forces' equipment holdings, some of which are beyond the critical stage, a consequence of acquisition system difficulties and political foot-dragging over the past decades.

A Defence Acquisition Strategy Template

- Clear definition of capability deficiency to be rectified – and what is NOT to be included.
- Early communication with industry on solutions to satisfy capability deficiency – NOT equipment discussions in earliest stages.
- Integrated government project teams staffed by skilled, knowledgeable people.
- Explicit recognition of risk by selecting a procurement strategy that inherently minimizes risk.
- Use of performance specifications, especially for service contracts.
- Consideration of supplier past performance.
- Early and consistent determination of procurement strategies.
- Link of acquisition strategy to industrial base strategy.
- Positive incentives for contractors.
- Realistic cash flow and timelines with gates before initiating projects.

Notes on Contributors

Peter Cairns (Vice Admiral, retired) served in the Canadian Navy for 39 years, retiring in 1994. His sea commands included the submarine *Onondaga*, the destroyers *Fraser* and *Margaree*, the 1st Submarine Squadron and the 5th Destroyer Squadron. In his senior appointments he served as Assistant Chief of Staff for Operations to the NATO Supreme Allied Commander Atlantic (SACLANT), the Commander of Maritime Forces Pacific and the Commander of Maritime Command. In 1997 he was appointed President of the Shipbuilding Association of Canada. He serves also as President of the Canadian Institute of Marine Engineers, is a member of the Shipbuilding and Industrial Marine Advisory Committee, the Defence Industry Advisory Committee, the Germanischer Lloyd Canadian Committee, and the Advisory Board of the Institute of Ocean Technology. Admiral Cairns is a Commander of the Order of Military Merit.

Dr Richard Gimblett served in the Canadian Navy for 27 years prior to becoming an independent historian and defence policy analyst. Having co-authored the official account of the first Gulf War under the title *Operation FRICTION: The Canadian Forces in the Persian Gulf, 1990-1991* (Dundurn, 1997), his interest in that region continues with *Operation Apollo: The Golden Age of the Canadian Navy in the War Against Terrorism* (Magic Light, 2004). His last service appointment was to the Navy's Directorate of Maritime Strategy, as lead writer of *Leadmark: The Navy's Strategy for 2020* (DND, 2001). His various affiliations include President of the Canadian Nautical Research Society and Adjunct Professor of History at Queen's University in Kingston, Ontario.

Pierre Lagueux served in the Canadian Forces for 24 years. A graduate of the Royal Military College, he served as a Logistics officer in a variety of base, station and headquarters functions. In 1990 he left the Canadian Forces to join the senior executive ranks of the public service within the Department of National Defence, culminating with the position of Assistant Deputy Minister (Materiel) from 1996 to 1999. Of note he was directly responsible for the development and implementation of the interdepartmental procurement strategies that led to the delivery of the NATO Flying Training Program in Canada (NFTC), the Canadian SAR Helicopter Project, the Canadian Submarine Replacement Project, and the Canadian participation in the US Joint Strike Fighter Program. Upon retirement from the public service in 1999, he joined CFN Consultants as a Senior Partner.

Brian MacDonald (Colonel, retired) is President of Strategic Insight Planning and Communications, and consults on international and domestic strategic and business security issues. A graduate of the Royal Military College and York University, he is a prominent media commentator on security and defence issues, counting hundreds of television, radio and speaking appearances. His international conference papers have included: Kings and Emmanuel Colleges of Cambridge University; the German Armed Forces University, Munich; the Beijing Institute for International Strategic Studies; the Shanghai Institute for International Studies; the International Society for the Systems Sciences in Atlanta; and the Atlantic Treaty Association in Budapest, Copenhagen, Edinburgh, Paris, Slovenia, and Washington. To date he has edited sixteen books and authored one, *Military Spending in Developing Countries: How Much Is Too Much?* (Carleton University Press, 1997).

Paul Manson (General, retired) served in the RCAF and Canadian Forces for 38 years. A fighter pilot, he commanded at all levels of the Air Force. He was Chief of the Defence Staff from 1986 to 1989. Following retirement from the military General Manson was president of a large aerospace company for eight years. During this period he served a term as the Chairman of the Aerospace Industries Association of Canada. As a Trustee of the Canadian Museum of Civilization, he chairs the Canadian War Museum Committee. The author of numerous articles on defence issues, he is the current President of the Conference of Defence Associations Institute. General Manson is a Commander of the Order of Military Merit and Commander of the U.S. Legion of Merit. In 2002 he became an Officer of the Order of Canada.

Howard Marsh (Colonel, retired) joined the Canadian Army and served in the Canadian Forces for 37 years. In addition to 20 years of operational service he was department head of Applied Military Science and the Commandant of the Royal Military College. His various director-level positions in National Defence Headquarters provided him insight to the military culture and its interface with procurement. He has co-authored four books on the topics of military leadership, the revolution in military affairs, national defence administration, and the state of the Canadian Armed Forces. He was a senior defence analyst to the Conference of Defence Associations.

Notes concernant nos collaborateurs

Peter Cairns (vice-amiral, retraité) a servi 39 ans dans la Marine canadienne et il a pris sa retraite en 1994. Ses commandements en mer ont été notamment sur le sous-marin Onondaga, les destroyers Fraser et Margaree, la 1^{ère} escadrille de sous-marins et la 5^{ème} escadrille de destroyers. Nommé à des postes de direction, il a servi comme chef d'état-major adjoint (opérations), Commandant suprême allié de l'Atlantique, de l'OTAN, (SACLANT), il a été commandant des Forces maritimes du Pacifique et commandant du Commandement maritime. En 1997, il fut nommé président de l'Association de la construction navale du Canada. Il a également servi comme président de l'Institut canadien de Génie maritime, il est membre du Comité consultatif sur la construction navale et la marine industrielle, du Comité consultatif sur l'industrie de défense, du Comité canadien Germanischer Lloyd, et sur la Commission consultative de l'Institut des technologies océaniques. L'amiral Cairns est commandeur de l'Ordre du mérite militaire.

Richard Gimblett a servi 27 ans dans la Marine canadienne avant de devenir historien et analyste des politiques de défense à titre indépendant. Sa dernière nomination de service fut à la Direction générale de la stratégie maritime de la Marine, comme chef rédacteur du document *Point de mire: Stratégie de la Marine pour 2020* (MDN, 2001). Parmi ses diverses affiliations, on compte celles de président de la Société canadienne pour la recherche nautique et de professeur auxiliaire d'histoire à l'Université Queen's de Kingston (Ontario).

Pierre Lagueux a servi 24 ans dans les Forces canadiennes. Diplômé du Collège militaire royal, il a servi comme officier de la logistique dans diverses fonctions sur des bases, des stations et aux quartiers généraux. En 1990, il quitta les Forces canadiennes pour rejoindre les rangs des cadres supérieurs de la Fonction publique au sein du Ministère de la défense nationale, dont le point culminant fut le poste de sous-ministre adjoint (Matériel), de 1996 à 1999. Il est à noter qu'il fut directement responsable de l'élaboration et de la mise en oeuvre des stratégies d'approvisionnement interministérielles qui ont conduit à la prestation du programme Entraînement en vol de l'OTAN au Canada (NFTC), du projet d'hélicoptères pour le Programme canadien de recherche et sauvetage, du projet de remplacement des sous-marins canadiens, et de la participation canadienne au programme américain d'avions d'attaque interarmées. À sa retraite de la Fonction publique, en 1999, il s'est joint à la firme CFN Consultants à titre d'associé principal.

Brian MacDonald (colonel, retraité) est président de la firme Strategic Insight Planning and Communications, et donne des consultations sur les questions de stratégie et de sécurité des entreprises au niveau international et intérieur. Diplômé du Collège militaire royal et de l'Université York, il est un commentateur bien connu sur les questions de sécurité et de défense dans les médias. Parmi ses documents de conférences internationales, on trouve notamment : les Collèges Kings et Emmanuel de l'Université de Cambridge, l'Université des Forces armées allemandes, de Munich, l'Institut d'études stratégiques internationales de Beijing, l'Institut d'études internationales de Shanghai, la Société internationale des sciences des systèmes, à Atlanta, et l'Association du traité de l'Atlantique, à Budapest, Copenhague, Édimbourg, Paris, en Slovénie et à Washington. Jusqu'à maintenant, il a été rédacteur de seize livres et auteur d'un, intitulé *Military Spending in Developing Countries: How Much Is Too Much?* (Carleton University Press, 1997).

Paul Manson (général, retraité) a servi 38 ans dans la RCAF et les Forces canadiennes. Pilote de chasse, il a exercé un commandement à tous les niveaux de la Force aérienne. Il fut chef de l'état-major de la Défense de 1986 à 1989. Après sa retraite de la vie militaire, le général Manson fut président pendant huit ans d'une grande société d'aérospatiale. Pendant cette période, il a servi pendant un terme comme président de l'Association des industries aérospatiales du Canada. Comme fiduciaire du Musée canadien des civilisations, il préside le comité du Musée canadien de la guerre. Auteur de nombreux articles sur les questions de défense, il est le président actuel de l'Institut de la Conférence des associations de la défense. Le général Manson est commandeur de l'Ordre du mérite militaire et commandeur de la U.S. Legion of Merit. En 2002, il a été nommé officier de l'Ordre du Canada.

Howard Marsh (colonel, retraité) est entré dans l'Armée canadienne et a servi 37 ans dans les Forces canadiennes. En plus de 20 ans de service opérationnel, il fut chef de département des Sciences militaires appliquées et commandant du Collège militaire royal. Ses divers postes au niveau de directeur, aux quartiers généraux de la Défense nationale, lui ont permis de comprendre la culture militaire et son interface avec l'approvisionnement. Il est également coauteur de quatre livres sur les sujets du leadership militaire, de la révolution dans les affaires militaires, de l'administration de la défense nationale, et de l'état des Forces armées canadiennes. À sa retraite, il est devenu conseiller indépendant et analyste principal de la défense pour l'Institut de la Conférence des associations de la défense.



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