National Defence Défense nationale

Canadian Forces College

Collège des Forces Canadiennes

RCAF PILOT TRAINING AND ASD: ASSESSING AND IMPROVING A DYSFUNCTIONAL PARADIGM FOR THE FUTURE

Lieutenant-Colonel J. Clow

JCSP 37

Master of Defence Studies

Disclaimer

Opinions expressed remain those of the author and do not represent Department of National Defence or Canadian Forces policy. This paper may not be used without written permission.

PCEMI 37

Maîtrise en études de la défense

Avertissement

Les opinons exprimées n'engagent que leurs auteurs et ne reflètent aucunement des politiques du Ministère de la Défense nationale ou des Forces canadiennes. Ce papier ne peut être reproduit sans autorisation écrite.

Canada

CANADIAN FORCES COLLEGE – COLLÈGE DES FORCES CANADIENNES
JCSP 37 – PCEMI 37

MASTER OF DEFENCE STUDIES – MAÎTRISE EN ÉTUDES DE LA DÉFENSE

RCAF PILOT TRAINING AND ASD: ASSESSING AND IMPROVING A DYSFUNCTIONAL PARADIGM FOR THE FUTURE

By Lieutenant-Colonel J. Clow

4 January 2015

Word Count: 22 241

Compte de mots : 22 241

TABLE OF CONTENTS

ACRONYMS

ALSE	Aviation Life Support Equipment
ASD	Alternate Service Delivery
AW	Allied Wings
BHC	Basic Helicopter Course
BI	Bombardier Incorporated
CA	Contracting Authority
CAF	Canadian Armed Forces
CFB	Canadian Forces Base
CFE	Contractor Furnished Equipment
CFTS	Contracted Flying Training and Support
COA	Course of Action
CRS	Chief Review Services
CSA	Canada Services Agreement
DAST	Directorate of Air Simulation and Training
DND	Department of National Defence
ENJJPT	Euro-NATO Joint Jet Pilot Training
FI	Fatigue Index Units
FRP	Force Reduction Plan
FTD	Flying Training Device
FTDC	Fling Training Day Calendar
GFE	Government Furnished Equipment
HBC	Hawker Beechcraft Corporation
KFL	Kelowna Flightcraft Limited
KPI	Key Performance Indicator
KTS	Knots
MOC	Military Occupation Classification
NATO	North Atlantic Treaty Organization
NFTC	NATO Flying Training in Canada
NORAD	North American Aerospace Defense Command
O&M	Operations and Maintenance
OAA	Operational Airworthiness Authority
OAG	Office of the Auditor General
OEM	Original Equipment Manufacturer
PC	Performance Criteria
PEP	Performance Evaluation Period (6 months)
PET	Performance Evaluation Team
PIF	Performance Incentive Fee
PIFB	Performance Incentive Fee Board
PM	Performance Monitors
PMB	Program Management Board
PWGSC	Public Works Government Services Canada
QFI	Qualified Flying Instructor
RAM	Resource Allocation Model
RAAF	Royal Australian Air Force

RCAF	Royal Canadian Air Force
RSAAF	Royal Saudi Air Force
RSAF	Republic of Singapore Air Force
SOW	Statement of Work
TA	Technical Authority
TAA	Technical Airworthiness Authority
TAS	Traffic Avoidance System
TB	Treasury Board
TMA	Training Management Authority
TP	Training Plan
TSM	Technical Support Manager
VCDS	Vice Chief of the Defence Staff
VIQ	Variation in Quantity
WSM	Weapon System Manager
YFR	Yearly Flying Rate

ABSTRACT

Currently, two multi-billion dollar alternate service delivery (ASD) contracts are critical to the pilot production of the Royal Canadian Air Force (RCAF). However, these contracts expire commencing in 2021 and the future beyond this date remains undetermined.

This paper studied the impact of ASD on RCAF pilot production. While ASD allowed training fleets to be modernized, flawed programmatic assumptions negatively affected the resourcing and production. Moreover, program costs and structure hindered marketing efforts. These difficulties reduced contractor revenues which strained RCAF/contractor relations.

The recommendation is that future training fleets are government owned and contracting should be direct for service, thus eliminating a prime contractor. Upon this basis must be built an appropriately resourced program with clear performance measurement mechanisms, properly authorized to be marketed and expanded. In so doing the RCAF will ensure the success of its future pilot training program and leverage the benefits of ASD while avoiding pitfalls.

INTRODUCTION

Airpower is a key component in the complex matrix of tools available to the federal government in the fulfillment of Canada's strategic aims both militarily and diplomatically. It follows that force generation is essential in the sustainment of aerospace capability. In order to generate and sustain airpower, the RCAF[1] requires a robust, organic and cost-effective pilot training system. However, military pilot training is an expensive and complex endeavour. In 2012, the RCAF spent approximately $346.65 Cdn million on the training of all trades of which $304.92 Cdn million was directly attributable to the training of pilots to wings standard.[2] Given the high cost and extended timeline of creating pilots[3], it is vital to the national interest and to the RCAF that this training remains effective and affordable.

However, despite the importance of force generation, the RCAF experienced a sustained and systematic shortage of trained military pilots since the Force Reduction Program (FRP) of the early 1990s. The FRP's aim was to reduce military personnel costs linked with "establishment reductions and base closures."[4] The resultant savings were then to be balanced between reducing overall expenditures and increasing critical capital

[1] The term RCAF is used throughout this paper although the air component of the Canadian Armed Forces was not reconstituted as the RCAF until 2011.

[2] Department of National Defence website, Chief of Review Services, "Evaluation of Aerospace Training and Readiness Part 1 – Air Force Initial Occupational Training" (April 2012). Available from http://www.crs-csex.forces.gc.ca/reports-rapports/2012/187p0940-eng.aspx; Internet; accessed 29 October 2014.

[3] The timeline from induction to achievement of RCAF Wing standard averages approximately four years.

[4] Department of National Defence website, Chief of Review Services, "Audit of Force Reduction Program" (January 1997). Available from http://www.crs-csex.forces.gc.ca/reports-rapports/pdf/1997/705529-eng.pdf: Internet; accessed 15 July 2014, 2.

acquisition funding.[5] This program targeted specific military occupational classifications (MOCs) and many experienced military pilots took the option of early paid retirement.

Moreover, the import to reduce numbers of military personnel caused the Department of National Defence (DND) to embrace the Canadian government-wide ASD movement.[6] With the philosophy of reducing costs and maintaining core combat capabilities, non-core activities like support services were specifically targeted under a DND derived ASD strategy. [7]

As a result of these fiscal pressures and manpower realities the RCAF and the government of Canada have taken an outsourcing approach to pilot training. This approach has resulted in two complex, multi-billion dollar ASD contracts that are essential to the production of newly winged RCAF pilots. The current contracts, NATO[8] Flying Training in Canada (NFTC) and Contracted Flying Training and Support (CFTS), are differentiated in their fundamental approach in delivering the RCAF with pilot training and related services. As these contracts were let sequentially with several years between each, there was an attempt to apply lessons learned from one contract to the other. But the success of the ASD approach in the pilot training environment has been mixed. That is to say while pilots were and are being trained, they have not been trained

[5] LCol Clifford Beattie, "The Hypothetical Most Efficient Organization: The Fatal Flaw in the Alternative Delivery Process" (Toronto: Canadian Forces College paper, n.d.), 3. Available from www.cfc.forces.gc.ca/259/181/51_beattie.pdf; Internet; accessed 8 October 2014.

[6] *Ibid.*, 3.

[7] *Ibid.*, 3.

[8] North Atlantic Treaty Organization (NATO)

in sufficient numbers to fulfill the requirements of the RCAF.[9] According to the Central Review Services (CRS) audit of Initial MOC training in 2012, "The evaluation found that there has been a shortfall of between 200 and 250 (pilots) for the past ten years and there are no indications this problem is being resolved."[10]

With the largest of the contracts, NFTC, ending in 2021, the RCAF recently commenced the lengthy process to assess its future pilot training requirement. The outcome of the analysis will have a profound impact upon the next multi-billion dollar pilot training contract. However, given that 2021 is a relatively short time line to get such a large project finalized in the unwieldy government procurement construct, it is critical that efforts be focused on those factors that will determine the success or failure of such an endeavour.

While there are other pilot training programs in operation around the world to which the RCAF might look for lessons learned, there is no example which the RCAF can simply duplicate in order to fulfill its needs. The largest of these, the Euro-NATO Joint Jet Pilot training (ENJJPT) program in the United States, is a much larger program than NFTC and it operates with the subsidy of the government which is not allowed in Canada. Another example is the United Kingdom Military Flying Training System. While this program operates as a public-private partnership, it is still several years away

[9] The combined programs, NFTC and CFTS, produced approximately 85-90 New Wing Graduates (NWG) per year from 2000-2012. This is in contrast to the fact that the system was funded to produce 95 NWG until 2008 at which time there was a funding increase in CFTS to support an increase to 105 NWGs (PMB 0708).

[10] Department of National Defence website, Chief of Review Services, "Evaluation of Aerospace Training and Readiness…

from being fully operational.[11] It is therefore too new for valid comparison. In addition, the Royal Australian Air Force (RAAF) and the Republic of Singapore Air Force (RSAF) operate a public-private partnership to provide training in a joint arrangement.[12] The RCAF has conducted a visit of this program and while it appears that there are some areas of the program worthy of further investigation it is also not a comprehensive solution. In addition, there are several other examples of bilateral pilot training arrangements around the world.[13] While certain aspects of these programs will be mentioned, a detailed analysis is beyond the scope of this paper.[14]

Given this setting, this paper contends that there are a number of factors that must be taken into account by the RCAF in order to leverage the positive aspects of outsourcing while avoiding the pitfalls already encountered during its ASD experience. These lessons learned must be applied during the development of the next generation of RCAF pilot training contracting in order to ensure successes are replicated while failures are mitigated or avoided altogether. These factors include: implementation of ASD principles and philosophy, the capital asset acquisition paradigm, resource requirements,

---

[11] Craig Hoyle, "T-6C to head UK military training renewal." *Flightglobal* (October, 2014). Available from http://www.flightglobal.com/news/articles/t-6c-to-head-uk-military-training-renewal-405203/; Internet; accessed 23 November 2014.

[12] BGen M.P. Galvin, *Visit Report - Royal Singapore Air Force[sic] (RSAF) and Royal Australian Air Force (RAAF) Pilot Screening and Trg Systems* (17 Wing Winnipeg: file number 1776-1 (AF AOT), 3 January 2013.

[13] Tom Kington, "Common Jet Pilot Training Falters." *Defence News* (3 Dec 2013). Available from http://www.defensenews.com/article/20131203/DEFREG01/312030021/Common-Jet-Pilot-Training-Falters; Internet; accessed 24 Nov 2014.

[14] The focus of this examination is the RCAF experience with large-scale ASD as applied to pilot training capability.

performance measurement, the RCAF/contractor relationship and marketing.[15] Appreciating this broad spectrum of variables is vital because airpower operators tend to focus on capital asset requirement determination and selection, specifically which aircraft and simulators to employ, and fail to fully appreciate the implications of a contract structure that is not designed to ensure effective delivery of services. In fact, the success of the future pilot training program is almost entirely dependent upon effectively addressing these variables. As well, the structure of the contracting paradigm, for example resource ownership and control, is fundamental to the future success of pilot training in the RCAF.

In order to make this argument the paper is divided into five sections. The first section will deal with the geostrategic background of and the neoliberal rationale for contracting and the manner in which Canada has embraced ASD. The second section will examine the RCAF experience that identifies problem areas and relevant variables. The third section will discuss the contractor perspective regarding pilot training support contracts. Fourthly, the paper will determine lessons learned which should be applied to the next contract. Lastly, the paper will provide recommendations and conclusions for structuring the future pilot training system.

[15] Henceforth this paper shall refer to following six factors as the *critical factors*: implementation of ASD principles and philosophy, the capital asset acquisition paradigm, resource requirements, performance measurement, the RCAF/contractor relationship and marketing.

CHAPTER 1 - BACKGROUND OF ASD AND THE RCAF

During the Cold War, the Canadian military, like its NATO allies, maintained an operational structure based on the bi-polar superpower paradigm of large-scale armoured and mechanized maneuver formations for the Central European Theatre. This paradigm required military formations to be both self-contained and self-sustained.[16] Military logistics and support were integrated with combat formations units and although there were civilians employed by the military, they were not employed in positions critical or directly contributing to combat operations.[17] In fact, the civilian component of DND was often viewed in Canada as simply part of the military's contribution to regional economic development.[18]

The abrupt end of the Cold War and decaying economic situation in the early 1990s forced defence establishments to seek a solution for rising personnel costs and shrinking capital acquisition allocations. As a result of these pressures, militaries around the world turned to the nascent and cutting edge private firm concept of outsourcing.[19]

In Canada, the White Paper on Defence in 1994 set the tone for a turn to the outsourcing of capabilities considered to be non-core activities. It is within this capstone

---

[16] Major Jennifer M. Stephens, "Delivering Value Through Logistics," *Army Logistician* (November-December: 2008). Available from http://www.almc.army.mil/alog/issues/NovDec08/delivervalue_spectrum.html; Internet; accessed 7 October 2014.

[17] *Ibid.*

[18] David J. Savoie, "Summerside: Revisit the Base Closures," *Canadian Journal of Regional Science* (Spring: 1995), 57-76. Available from http://cjrs-rcsr.org/archives/18-1/4-Savoie.pdf; Internet; accessed 9 October 2014.

[19] Kindred Motes, "The Rise of Privatised Military Firms During and After the Cold War" (University of Essex: Autumn 2013). Available from http://www.academia.edu/7170804/The_Rise_of_Privatised_Military_Firms_During_and_After_the_Cold_War; Internet; accessed 7 October 2014.

document that the Canadian ASD paradigm was generated. The introduction of ASD within DND rapidly gained momentum and the level of outsourcing activity continued to accelerate faster than the analysis of effects could be completed. Therefore, despite the warnings of the Auditor General, ASD became ingrained in the operations and support of the Canadian military.[20] By examining the origins of the ASD philosophy, a better understanding of the outsourcing paradigm can be achieved. The current applications in the form of large outsourced RCAF pilot training contracts grew out of the private management theorems that were embraced by both the Crown[21] and DND. It is against this backdrop that future programs must be considered.

The Origins of ASD

In the aftermath of the 1991 collapse of the former Soviet Union[22] the justification for large defence budgets was brought into question amongst Canada and her allies. The apparently imminent threat of Soviet expansionism was popularly viewed to have disappeared.[23] The revised political world order was believed to have resulted in a more stable and predictable defence environment. Many governments utilized the apparent demise of an overt threat as grounds to channel funds previously directed to the military

---

[20] Office of the Auditor General of Canada website, "1999 November Report of the Auditor General of Canada," Chapter 27 – National Defence – Alternate Service Delivery. Available from http://www.oag-bvg.gc.ca/internet/docs/9927ce.pdf; Internet; accessed 25 August 2014.

[21] The term the "Crown" will be used throughout this paper in lieu of the "Canadian government."

[22] "Collapse of the Soviet Union," *Portulus.RU* (4 Sep 2007). Available from http://www.portalus.ru/modules/english_russia/print.php?subaction=showfull&id=1188915416&archive=&start_from=&ucat=11&; Internet; accessed 3 Oct 2014.

[23] Michelle R. Garfinkel, "The Economic Consequences of Reducing Military Spending," (Federal Reserve Bank of St. Louis, Nov-Dec: 1990), 48. Available from https://research.stlouisfed.org/publications/review/90/11/Spending_Nov_Dec1990.pdf; Internet; accessed 21 July 2014.

towards non-military items which required increased funding or which provided much higher political capital with the voting populace.[24] Such savings became popularly known as the "peace dividend."[25] Debate at the time was, however, unable to agree as to the size and scope of the windfall. Studies which indicated that as a result of the Soviet demise, members of the NATO could afford a strategic military funding reduction of one percent[26] were in direct contrast to statements from politicians that military expenditures could be reduced by up to twenty-five percent if not higher.[27]

At the same time that this geo-strategic earthquake was rumbling through NATO's defence establishments, the world found itself embroiled in a pervasive recession which added impetus to reducing defence funding. There were many reasons for this fiscal tumult, not the least of which was the sharp increase in fuel prices following the 1991 coalition invasion of Kuwait and Iraq during the First Gulf War.[28] In addition, high public and private debt loads limited governments' fiscal flexibility to spend their way out of the recession by incurring further debt. [29] Therefore, governments looked for reductions in activities for that were viewed as soft from a political

---

[24] Lieutenant-Colonel Michael Rostek, "A Framework For Fundamental Change? The Management Command And Control re-engineering Initiative," *Canadian Military Journal* (no4 Vol 5). Available from http://www.journal.forces.gc.ca/vo5/no4/manageme-gestion-eng.asp; Internet; accessed 21 July 2014.

[25] Collapse of the Soviet Union…

[26] Michelle R. Garfinkel, "The Economic Consequences… 48.

[27] *Ibid*., 49.

[28] Rob H. Kamery, "A Brief Review of the Recession of 1990-1991," Allied *Academies International Conference 2004*, 61. Available from *http://www.sbaer.uca.edu/research/allied/2004_maui/legal_ethical_regulatory_issues/14.pdf;* Internet; accessed 21 July 2014.

[29] Ibid. 61.

perspective.[30] The result was an ever increasing pressure to reduce expenditure on items like defence which were often the largest discretionary budget item.[31] Thus, the stage was set on both the strategic and political fronts for a paradigm shift in the delivery of military effect.

In order to achieve the desired savings, governments around the world sought to emulate the efficiency gains made amongst private companies in the previous decade.[32] Outsourcing became pervasive around the globe in both the public and private domains as governments and private companies sought to maintain or increase levels of service while reducing costs.[33] There was a concerted attempt to reduce overhead or efforts that were not a component of the core competency of the agency or business. [34] In the public world of fiscal crisis and ever decreasing budgets, private sector management theory, as embodied by ASD, was viewed as the solution to public sector inefficiency and mismanagement.[35]

In the Canadian context, the military tackled an amplified operational tempo post-Soviet break-up while also facing a significantly reduced defence allocation.[36] In truth, the demands upon the military were increasing in a uni-polar world when compared to

---

[30] LCol Michael Rostek, "A Framework For Fundamental Change...

[31] Lieutenant-Colonel Clifford Beattie, "The Hypothetical Most Efficient Organization…,1.

[32] "Alternative Service Delivery," *Institute for Citizen Centred Service* (August, 1999). Available from http://iccs-isac.org/en/clearinghouse/asd.htm; Internet; accessed 21 July 2014.

[33] Lieutenant-Colonel Michael Rostek A Framework For Fundamental Change?...

[34] "Strategic, Core and Non-Core Activities: What to outsource for best results?" *Intetics: The Remote In-Sourcing Company* (02 April 2014). Available from http://www.intetics.com/strategic-core-and-non-core-activities-what-to-outsource-for-best-results/; Internet; accessed 21 July 2014.

[35] *Ibid*.

[36] *Ibid*.

the relative stability of the Cold War. Aside from a garrison presence in Europe and a longstanding peacekeeping presence in Cyprus, the Canadian military could hardly have been considered an expeditionary force. However, the 1990s saw significant combat deployments to Somalia and Bosnia, humanitarian intervention, peacekeeping support and disaster response, domestic and international, while maintaining traditional roles and participating in NATO and NORAD.[37] Finding itself in the midst of a world-wide economic recession and a resultantly dire Canadian financial situation, the federal government determined that immediate action was necessary to prevent the nation from plunging into possible debt default. The net result was a twenty-three percent reduction in defence spending and a thirty percent reduction in troop levels.[38]

As a result of the government's action the Canadian Armed Forces (CAF) faced a prolonged period of budgetary restrictions during the 1990s. This so-called *Decade of Darkness*[39] was the result of many economic and political factors. Initially this was dealt with by reducing funds earmarked for capital projects, especially those viewed as unnecessary or excessive. The cancellation of the EH-101 in 1993 epitomized such an approach.[40] The intent of this program was to replace the Sikorsky Sea King which had been operational in Canada for some forty years. The Liberals, when in opposition, were

---

[37] Martin Shadwick, "The Chrétien Legacy," *The Canadian Military Journal* (vol 4 no. 4). Available from http://www.journal.forces.gc.ca/vo4/no4/comment-eng.asp; Internet: accessed 25 July 2014.

[38] Lieutenant-Colonel Michael Rostek A Framework For Fundamental Change?...

[39] Idris Ben-Tahir, "Decades of Darkness," *Ottawa Citizen* (05 March 2007). Available from http://www.canada.com/ottawacitizen/news/opinion/story.html?id=81b0a894-6704-4e8c-b175-2149a70c9542; Internet; accessed 26 September 2014.

[40] "Canada Settles Claim On Canceled Helicopters," *New York Times Archives* (24 January 1996). Available from http://www.nytimes.com/1996/01/24/business/international-briefs-canada-settles-claim-on-canceled-helicopters.html; Internet; accessed 23 June 2014.

extremely successful in portraying the EH-101 as an unnecessary and over-priced Cold War anachronism of Conservative excess.[41] Liberal popularity grew further when, in 1993, the newly elected government kept its promise and cancelled the program with the assurance of redirecting funding to social programs.[42] This public perspective was held despite the $470 Cdn million in penalties the government was required to pay to Agusta-Westland and the realization that the program would have created some 45,000 person-years of Canadian employment and $3.2 Cdn billion in regional industrial benefits.[43] Overall, while military spending was often used as political currency, the CAF entered a period where any military spending was castigated as unnecessary given the end of the Cold War.[44]

These fiscal and political factors resulted in the 1994 White Paper on Defence. This document outlined government plans to decrease financial and personnel resources allocated to national defence. These resources would be applied to the deficit in order to aid in the reduction of the national debt. As stated in this capstone document, "At the present time, our prosperity – and with it our quality of life – is threatened by the steady

---

[41] Audrey McLaughlin, "Cold War Copters a waste of money," *The Toronto Star* (28 July 1992). Available from http://pqasb.pqarchiver.com/thestar/doc/436670291.html?FMT=ABS&FMTS=ABS:FT&type=current&date=Jul%2028,%201992&author=Audrey%20McLaughlin&pub=Toronto%20Star&edition=&startpage=&desc=Cold%20War%20'copters%20a%20waste%20of%20money: Internet; accessed 18 Sep 2014.

[42] Lieutenant-Colonel Michael Rostek, "A Framework For Fundamental Change?...

[43] Aaron P. Plamondon, "The Politics of Procurement: Military Acquisition in Canada and the Sea King Helicopter," (UBC Press: 2010), 134. Available from http://books.google.ca/books?id=QLG-cyQbV_EC&pg=PA131&lpg=PA131&dq=jobs+lost+in+eh-101+cancellation&source=bl&ots=VBIJU9fSj-&sig=vEq62yyzziI5MM9wcGpm4au_qLg&hl=en&sa=X&ei=9HZhVJr-LOnuigKB34GACg&ved=0CE4Q6AEwCA#v=onepage&q=jobs%20lost%20in%20eh-101%20cancellation&f=false; Internet; accessed 3 October 2014.

[44] Idris Ben-Tahir, "Decades of Darkness,"…

growth of public sector debt."[45] In addition, the government made the source of additional government funding cuts very clear: "Although National Defence and the Canadian Forces have already made a large contribution to efforts to reduce the deficit, the Government believes that additional cuts are both necessary and possible."[46] The White Paper went on to state that "The Department and the Forces will also reshape the defence program and operate more efficiently to deliver the elements of the policy outlined in the White Paper."[47] It is noteworthy that despite such overt statements regarding the reduction in resources there was no real concomitant reduction in the government's view of the military's strategic roles as the traditional roles were maintained.[48] Thus, there was a continuation of the traditional capability-commitment gap that has often existed in the Canadian military context.[49] It is clear that defence policy during this time was "based more upon domestic determinants (the economy)"[50] than Canada's place in the geostrategic situation. The 1994 Defence White Paper called for major cuts in defence spending and the government directed National Defence "to operate with fewer resources, fewer people and less infrastructure."[51] With this

---

[45] National Defence and the Canadian Forces website, "1994 White Paper on Defence," Chapter 2 para. 17. Available from http://www.forces.gc.ca/admpol/1994%20White%20Paper%20on%20Defence.htm; Internet; accessed 5 October 2014.

[46] *Ibid*., Chapter 2 para 19.

[47] *Ibid*., Chapter 2 para 20.

[48] Joel Sokolsky, "Canada, Getting it Right this Time: The 1994 Defence White Paper," *US Army War College* (31 May1995). Available from www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA297786; Internet; accessed 10 Oct 2014.

[49] *Ibid*.

[50] *Ibid*.

[51] National Defence and the Canadian Forces website, "1994 White Paper on Defence,"…

imperative unmistakeably at the forefront of government thinking, there was a foundational shift in the delivery of military effect that profoundly shaped the future of national defence and the CAF.

The outsourcing of support services was fundamental to the government's strategy of reducing resource allocation to the military. In fact, when the ASD program was launched in 1995 the government publically set "a goal of saving $200 Cdn million a year by 1999 and $350 Cdn million a year by 2001."[52] This benchmark embodies the reality that defence funding decisions were to be made primarily with the aim of minimizing expenditure vice being driven by capability requirements. Such goal setting is indicative of the inherent danger of ASD. This is that cost cutting becomes the measure of success vice streamlining service or delivering better service for the same or even slightly greater cost.[53]

In fairness, the military ASD revolution was not purely a Crown driven event but rather the government was opportunistic in reacting to positive reports from several allies including Australia, the United Kingdom and the United States.[54] Available reports indicated that Canadian allies were realizing savings on the order of 20% to 30%.[55] Therefore, it was against this political backdrop that defence planners recognized that a

---

[52] *Ibid.*

[53] Lieutenant-Colonel Clifford Beattie, "The Hypothetical Most Efficient Organization…3.

[54] *Ibid*., 3.

[55] *Ibid*., 3.

new course had to be charted within the altered funding paradigm in order to maintain operational capability.[56]

To achieve its cost reduction aims the government focused on two main areas. Firstly, the government viewed services requiring military personnel inputs as inherently wasteful and sought efficiencies to minimize personnel requirements. As clearly outlined in the 1994 White Paper, "Most areas of defence will be cut. The relative weight of the naval, land and air establishments will be altered to allow for the transfer of more resources to where they are most needed – mainly to operational land forces. Everything is being made leaner."[57] Secondly, ASD solutions were to be sought wherever possible in order to reduce costs. This policy specifically targeted logistical support functions that were deemed to be non-core activities as related to the delivery of combat power. Both the procurement of equipment and delivery of support functions were prime candidates to reduce costs. Thus, the 1994 White Paper laid out the path to the emergence of ASD as a key component of government and defence policy.

Reducing Uniformed Military Personnel

Military personnel are very expensive and their value is often difficult to capture using productivity matrices utilized in the private sector which makes them a prime target for cuts. In fact, military manning realities are such that personnel overhead is much higher than that of private corporations. Professional development, deployments and annual leave requirements demand extra personnel to account for absences from garrison duties. Anecdotally, if you need three military people working at any one time you need five personnel on strength in order to account for these extra considerations. By

[56] Lieutenant-Colonel Michael Rostek A Framework For Fundamental Change…

[57] National Defence and the Canadian Forces website, "1994 White Paper on Defence,"…52.

contracting out what were seen as non-core military functions to civilian companies, personnel costs could be greatly reduced.[58] Additionally, DND retained much of the same infrastructure with the associated personnel required as caretakers as it had for the majority of the preceding decades during the Cold War. Thus, ASD was as an enabler to reduce a costly infrastructure footprint which would result in concomitant reductions in personnel and funding requirements.[59] As stated by the Office of the Auditor General (OAG) in 1999, DND policy was that "In-house support activities were to be transferred to Canadian industry if business case analyses demonstrated a potential for increased cost effectiveness, or shared with private industry under various partnership arrangements."[60] Indeed, the 1994 White Paper candidly stated, "Personnel cuts will continue."[61] There was also a specific mention of "more emphasis on renewable, short-term periods of service for members of the Canadian Forces."[62] This initiative to reduce uniformed service personnel and departmental civilians was in addition to the FRP that had begun in 1992 and continued through 1996.[63] The resultant boon of personnel cost savings, in salaries and pensions, would be used to compensate for reduced budgets and in this way

---

[58] Murray Brewster, "National Defence struggling to staff mental health positions in remote outposts," *The Globe and Mail* (30 November 2014). Available from http://www.theglobeandmail.com/news/national/somnia/article21840761/; Internet; accessed 30 November 2014. As indicated in a recent article in *The Globe and Mail*, uniformed personnel are more expensive than civilian employees or contractors in terms of long-term benefits.

[59] Office of the Auditor General of Canada website, "1999 November Report of the Auditor General of Canada," …

[60] *Ibid*.

[61] National Defence and the Canadian Forces website, "1994 White Paper on Defence,"…63.

[62] *Ibid*., 65.

[63] Department of National Defence website, Chief of Review Services, "Audit of Force Reduction Program," (January 1997), 1-2. Available from http://www.crs-csex.forces.gc.ca/reports-rapports/pdf/1997/705529-eng.pdf: Internet; accessed 15 July 2014.

governments could reap the dual benefit of sound fiscal management while maintaining capabilities and capital projects.[64] In the Canadian context, although the military personnel footprint would be reduced, the transfer of such spending to direct civilian job creation would also result in regional economic development outcomes that could derive advantageous political capital while reducing precious government resources allocated to the military.

ASD of Support Functions

The second element of the Crown's ASD strategy was the contracting out of support functions deemed to be non-core activities. There was an enormous opportunity to reduce costs as the OAG estimated that in 1995 non-core support services "consumed approximately one-third of the Department's budget of $10.3 Cdn billion."[65] Several non-core support services were targeted for review by DND, such as equipment maintenance, supply services and information technology.[66]

Another component of this approach was the revision of the national procurement strategy especially as it related to capital acquisition and logistics. The government directed DND to adopt better business practices and to increase its emphasis on the rather new industry concept of *just-in time* delivery of common usage items to reduce inventory costs.[67] It decreed that DND increase the procurement of off-the-shelf commercial technology which met essential, but not necessarily complete, military specifications. As

---

[64] Lieutenant-Colonel Clifford Beattie, "The Hypothetical Most Efficient Organization…1.

[65] *Ibid*., 3.

[66] *Ibid*., 3.

[67] National Defence and the Canadian Forces website, "1994 White Paper on Defence,"…63.

stated in the 1994 White Paper, "Full military specifications or uniquely Canadian modifications will be adopted only where these are shown to be absolutely essential."[68] This was a key strategy to reduce costs and personnel requirements within DND. The resultant savings were applied to a combination of lowering debt and the generation of political capital via targeted private industry benefits.

The implementation of ASD strategy and philosophy within DND set the stage for civilian involvement in military pilot training. DND determined that training was a non-core activity as related to core combat capability. Thus, assets previously required for force generation could be re-directed to force projection at lower overall cost. Similarly, as a result of the revised procurement policy, training assets were also non-core and were ripe for lease based arrangements. This had the side-benefit of reducing the number of large headline attracting capital acquisition programs which were politically sensitive following the EH-101 debacle.

This *motis operandi* was already in its nascent stages as the FRP began in 1992 and the changes resulting from the evolving strategic situation began to play out. At that time there were already some partnerships in place when outsourcing began to gain momentum following the 1994 White Paper. As well, in the aftermath of the government's acceptance of the ASD concept, several large service support contracts were let to private industry. Despite mixed results and misapplication of outsourcing theorems, the indiscriminate movement towards contracting out services and partnering with private industry continued unabated.

The RCAF was the first military service to embark on large scale partnership with

---

[68] *Ibid*.

private industry. Bombardier International (BI)[69] signed the CFTS contract arrangement in 1992. Within this contract BI took over the delivery of Phase I Primary Flying Training and provided ground instruction and aircraft maintenance for Basic Helicopter and Multi-Engine training at the former Canadian Forces Base (CFB) Portage La Prairie in Southport, Manitoba. Capital assets were either contractor furnished (CFE) via purchase or government furnished via lend arrangement to the contractor. This partnership was good for both the military and private sectors. As the intent in 1989 had been to close the base, the contract signing and subsequent reinvigoration of the aerodrome facilities was heralded by the local community for its job preservation and income generation. BI considered this contract as a foothold in the growing military training environment.[70] For its part, the RCAF achieved a boon from a personnel perspective. Valuable maintenance personnel were redirected to other fleets and, although all flying instruction except Phase I was provided by military pilots, there was a reduction in the requirement to send pilots from operational units to the training environment. These outcomes were in complete harmony with the government's ASD ideals.

As the outsourcing movement gained momentum the government embraced ever larger support contracts despite warning signs that either savings or operational effect were suffering.[71] An example of this larger scale outsourcing was the contracting of all base support functions at 5 Wing Goose Bay in April 1998 to SERCo of the United

---

[69] During the course of the NFTC program the military training division of Bombardier was renamed Bombardier Military Aviation Training, BMAT, but is referred to as BI throughout this paper.

[70] Department of National Defence website, "Backgrounder: Contracted Flying Training and Support," (30 March 2005). Available from http://www.forces.gc.ca/en/news/article.page?doc=contracted-flying-training-and-support-cfts/hnocfoke; Internet; accessed 5 August 2014.

[71] Lieutenant-Colonel Clifford Beattie, "The Hypothetical Most Efficient Organization…5.

Kingdom. The aim as stated in a Vice-Chief of the Defence Staff (VCDS) review of the program was to "reduce overhead costs… (and)…obtain cost reductions, achieve flexibility, and achieve added value."[72] This contract allowed a reduction of CAF personnel at the base from approximately 270 to ninety. This was an important savings given the costs associated with military personnel living in an isolated location such as Goose Bay. The commitment to the outsourcing paradigm on a large scale was unambiguous.[73]

Conclusion

The Canadian government turned to outsourcing as a reaction to the changing strategic landscape of the early 1990s. The combination of an economic recession and the end of the Cold War both provided an opportunity and to some extent forced the government to seek budgetary reductions. Given the reality that Canadian military spending was viewed as discretionary, DND became a target ripe with opportunity for reallocation. The White Paper of 1994 clearly outlined the intent to reduce resources allocated to the military via outsourcing wherever possible. This policy focused on what were perceived to be non-core support functions and the reduction of uniformed personnel far below Cold War levels. The government entered into these contracted arrangements based on theories formulated in the private sector and embraced them whole-heartedly on an ever increasing scale as the implementation of the White Paper progressed. The next logical step in the process was large scale outsourcing in the high expenditure area of pilot training in order to reduce personnel and financial costs.

---

[72] Colonel Glynne Hines, "Alternate Service Delivery: Managing to get it done right," National Security Studies Course Paper (Canadian Forces College, 2000), 8. Available from http://www.cfc.forces.gc.ca/papers/nssc/nssc4/hines2.pdf; Internet: accessed 15 August 2014.

[73] *Ibid*., 11.

CHAPTER 2 - RCAF PILOT TRAINING AND ASD

In the mid-1990s, the RCAF fully embraced the outsourcing of its expensive and obsolescent pilot training system. In keeping with the hypothesis that a private industry solution was less expensive than a military owned system, the RCAF outsourced its undergraduate pilot and basic fighter pilot training in two multi-billion dollar programs.[74] These programs were based on public-private partnerships with contractors and other allied nations.[75] The first of these contracts was NFTC which was let in 1998 and training commenced in 2000. The second was CFTS which commenced transition operations in 2005 and became operational in 2007. The contracts included the delivery of flying training by a civilian corporation as the prime contractor with capital assets provided via a mix of Government Furnished Equipment (GFE) and newly purchased CFE. The programs each utilize a corporate account which is not part of the RCAF's operating budget baseline but is managed by the RCAF on behalf of the VCDS.[76] As the contracts were let sequentially, there was an attempt to apply lessons learned from NFTC to CFTS.

---

[74] The two programs are NFTC and CFTS. NFTC consists of two operating sites: one in Moose Jaw, Saskatchewan and one in Cold Lake, Alberta which are part of 15 Wing Moose Jaw. 2 Canadian Forces Flying Training School (2 CFFTS) in Moose Jaw operates CT-155 Hawk (Hawk) and CT-156 Harvard II (Harvard) aircraft. 419 Sqn in Cold Lake operates Hawk aircraft. CFTS consists of one site at Southport, Manitoba. 3 CFFTS in Southport operates Grob 120A, CH-139 Jet Ranger, Bell 412 CF Outlaw and C-90B King Air aircraft.

The two programs are highly interdependent. The training consists of several phases: Phase I (3 CFFTS/AW) is conducted on the Grob with successful students proceeding to Phase II (2 CFFTS) on the Harvard. Students are then selected for one of three training streams: Phase III Helicopter at 3 CFFTS utilizing CH-139 Jet Ranger (Basic) and Bell 412 CF Outlaw (Advanced), Phase III Multi-Engine at 3 CFFTS utilizing C-90B King Air or Phase III Jet at 2 CFFTS for Phase III Jet/Fighter training on the Harvard. Students who continue in the Jet/Fighter stream complete Transition training (Phase IV T) on the Hawk at 2 CFFTS. Successful candidates then proceed to Fighter Lead-In Training (Phase IV FLIT) at 419 Sqn. See Appendix 1: RCAF Pilot Training Phases (CFTS and NFTC).

[75] Office of the Auditor General of Canada website, "1999 November Report of the Auditor General of Canada," …

[76] Colonel Glynne Hines, "Alternate Service Delivery: "Managing to get it done right"…6.

Primarily these lessons learned centred around attempting to build increased flexibility into the CFTS program. Both are organized in a manner consistent with the government's ASD aims: reduction of uniformed military personnel and reduction of cost.

Of note, NFTC ends in 2021 while CFTS ends in 2027 and there is a strong desire to harmonize the training elements in one contiguous system post-2027. Therefore, the determination of the requirement in the interim period, 2021-2027, is a high RCAF priority to bridge the gap until the long-term comprehensive solution commences in 2027. As the programs are now mature, an examination of their strengths and weaknesses reveals many lessons which can and should be applied to the next pilot training solution.

NATO Flying Training in Canada

In 1996 DND gained Program Management Board (PMB) and Treasury Board (TB) approval for a 20 year $2.8 Cdn billion[77] sole source contract with BI to provide support services for pilot training to the RCAF.[78] This complex agreement was the largest service contract let by the government at that time.[79] To this day, there are few in government or DND that understand both the contract structure and the operational impacts upon pilot production and cost.[80] By examining the history of NFTC and its strengths and weaknesses, we can better situate our consideration of any future pilot

[77] The initial contract value was $2.8 Cdn billion which increased to $3.4 Cdn billion including foreign sales. The escalated contract value is $4.3 Cdn billion.

[78] *Ibid*., 15-17.

[79] *Ibid*.

[80] Office of the Auditor General of Canada website, "2002 September Status Report of the Auditor General of Canada," Chapter 4 – National Defence – NATO Flying Training in Canada. Available from http://www.oag-bvg.gc.ca/internet/English/parl_oag_200209_04_e_12389.html; Internet; accessed 30 September 2014.

training contract.

In 1992, NATO identified a requirement for common fast-jet training and invited member nations to submit proposals. The initiative aimed to reduce costs and to increase interoperability. The United States had offered to continue to host large-scale Allied operations at the ENJJPT at Sheppard AFB. However, the United States concurrently determined that the forecasted NATO training requirement, post-2000, would exceed the capacity of ENJJPT.[81] At the same time, DND was examining options for the future of military pilot training; three options were considered. First was recapitalizing the fleet at a cost of approximately $700 Cdn million but early on this was deemed unaffordable and difficult politically in an environment of declining defence budgets.[82] Second was the extension of some portion of the legacy training fleets, CT-114 Tutor and some CF-18 Hornet aircraft, to complete specialty jet training, but this would also have been very expensive in terms of operating costs. The third option was to retire the Tutor fleet and purchase offshore jet training.[83] Given the strong desire to maintain a domestic training capability and NATO's exploration of a second centralized training site, DND began to explore a fourth option of a domestic multinational training centre.

In December 1994, BI delivered an unsolicited proposal to the Crown for a public-private partnership which contained a developed business case. As a result, the Crown submitted a proposal to NATO in 1995 to host a training centre. This situation

---

[81] Department of National Defence website, "Backgrounder: Canada's Flying Training History, NATO Flying Training in Canada, National Defence and the Canadian Forces," …

[82] Canada. The Standing Committee on Public Accounts, "Eighteenth Report," (2-4 June 2003). Available from http://www.parl.gc.ca/HousePublications/Publication.aspx?DocId=1032272&Language=E&Mode=1&Parl=37&Ses=2; Internet; accessed 25 September 2014.

[83] Office of the Auditor General of Canada website, "1999 November Report of the Auditor General of Canada," …

lead to the creation of an overall NATO Flying Training concept which included ENJJPT in the United States and NFTC in Canada.[84] While the bulk of NATO training would occur in the United States, DND attempted to posture itself as an overflow alternative. As a result, DND developed a fully-costed proposal in June 1996[85] and the NFTC Project Office stood up on 18 November 1997.[86] The contract between BI and the Crown, termed officially as the Canada Services Agreement (CSA)[87], was let in 1998 and several countries agreed to participate in the program. Training began at NFTC in 2000.

Strengths of the NFTC Program

In examining NFTC it is clear that there are several aspects of the program that were advantageous to DND. These include: compliance with government ASD policies and aims, reduction of uniformed personnel requirements, fleet modernization in challenging capital project environment, built in mechanisms to facilitate sales to other air forces, achievement of a level of economy of scale and automatic triggers which required increased resource allocation in the event of sales. An analysis of these factors should be considered to ensure that the strengths of the current program are carried forward in any future training model.

The NFTC program blended together the aims of the Crown, BI and DND. The CSA was a landmark endeavour which was extremely complex and included structural

---

[84] Department of National Defence website, "Backgrounder: Canada's Flying Training History…

[85] Office of the Auditor General of Canada website, "1999 November Report of the Auditor General of Canada," …15-17.

[86] Colonel Glynne Hines, "Alternate Service Delivery: "Managing to get it done right"…6.

[87] Canada. Public Works Government Services Canada. "Canada Services Agreement in Support of the Training of Canadian Military Pilots between Her Majesty the Queen in Right of Canada and Bombardier Inc." (12 May 1998).

elements that are unique to this day in Crown contracting. As stated by the Standing Committee of Public Accounts in June 2003, "In developing the NATO Flying Training in Canada program, the Department of National Defence has found an innovative way of training its pilots. This program promises to showcase the talents of Canadian Air Force instructors and the skills and ingenuity of the private sector participants."[88] In keeping with Crown ASD principles, the benefits of the NFTC program were as follows: creating employment, keeping 15 Wing Moose Jaw open and viable, aiding Canada's aerospace industry and making a noticeable contribution to the NATO alliance.[89] Given DND's aim of retaining domestic military flying training, the nature of the NFTC concept melded near perfectly with the strategic aims of the Crown.

Under the partnership agreement the number of military personnel required at NFTC's two sites to conduct military flying training decreased by several hundred. DND provided program management, existing infrastructure like aerodrome facilities, military flying instructors and the military flying areas which covered over 700,000 km.[90] As the prime contractor BI was responsible to provide aircraft, simulators, classroom training systems, maintenance services, and ground school training.[91] BI signed a variety of other agreements with various sub-contractors to supply specialty services like weather reporting, Snow and Ice Control, firefighting, food and janitorial services as well as simulator, termed in NFTC lexicon as a Flying Training Device (FTD), maintenance. In

---

[88] Canada. The Standing Committee on Public Accounts, "Eighteenth Report,"…

[89] Office of the Auditor General of Canada website, "1999 November Report of the Auditor General of Canada," …15-17.

[90] Bombardier Aerospace, Military Training, internet; http://www.bombardier.com/en/aerospace/specialized-aircraft/military-training.html; accessed 17 October 2014.

[91] Colonel Glynne Hines, "Alternate Service Delivery: "Managing to get it done right"…6.

short, the RCAF conducted flying training and civilians conducted the preponderance of support activity. This was in compliance with the Crown's aim of reducing levels of uniformed personnel.

The program's capital assets were funded in an innovative and unique manner.[92] In order to manage mutual risk the government established a not-for-profit company called Milit-Air.[93] Milit-Air was incorporated on 12 March 1998 under Part II of the *Canada Corporations Act*[94] and had no capital or assets. It was established for the sole purpose of acquiring aircraft, FTDs and other capital assets for the use of NFTC.[95] Milit-Air conducted a bond issue with a principal value of $720 Cdn million which was utilized to purchase the aircraft and other capital assets that were then leased to BI who charged DND for their use.[96] Milit-Air was able to successfully raise funds at a favourable rate because of the federal government's guaranteed, unconditional lease payments for the aircraft.[97]

DND determined that a new pilot training program was unaffordable based on

---

[92] Office of the Auditor General of Canada website, "1999 November Report of the Auditor General of Canada,"…

[93] *Ibid*. It is notable that the Department of Finance suggested in 1997 that the equipment be purchased by the government and provided as GFE. While DND responded with an analysis comparing public/private financing rates the study was performed at a point where, if the financing model was altered, the capital assets would not have been in place in time for the planned training start at the end of 1999.

[94] Canada. Industry Canada, "General Overview of the Canada Corporations Act Part II," Available from http://www.ic.gc.ca/eic/site/cd-dgc.nsf/eng/cs02167.html; Internet; accessed 20 October 2014.

[95] The original purchase included 18 Hawk, 24 Harvard aircraft as well as 2 Hawk FTD's and 3 Harvard II FTD's. This numbers included 1 Hawk and 2 Harvard II airframes as spare parts aircraft. These are termed Series – 1 Assets as defined in Schedule R-14 of the CSA.

[96] The bonds were Series 1 Amortizing Secured Bonds which paid 5.75% per annum and were rated AA by the Canadian Bond Rating Service (CBRS).

[97] Canada. The Standing Committee on Public Accounts. "Eighteenth Report"…

funding issues and the relative size of the RCAF requirement. One method to reduce unit cost was to increase the size of the program. An example of this is ENJJPT which, at three to four times the size of NFTC, created much greater economies of scale.[98] Therefore, the program was designed based on the assumption of foreign participation. In fact, the TB authority for the project included a large pre-approval amount that facilitated expansion without the need to obtain further authority until the ceiling was to be exceeded. The hope was that countries could be enticed to train in Canada in much the same way as did the World War II British Commonwealth Air Training Plan and the NATO Air Training Plan from 1950-1958 and subsequent smaller scale initiatives.[99] During the development phase of the program it was evident that with a relatively modest level of foreign participation, the RCAF could both modernize its training and do so at lower cost than other options.[100]

Although only modest numbers of allied participants were needed, it was clear that such commitments were critical to the economics of program launch.[101] Some nations were faced with the same type of budgetary issues and the fact that NFTC cost twice as much as ENJJPT hindered firm commitments. Nevertheless there were numerous bilateral and multilateral discussions and a number of nations indicated interest

---

[98] "Euro-NATO Joint Jet Pilot Training Program, Sheppard Air Force Base." Available from http://www.sheppard.af.mil/library/factsheetspage/factsheet.asp?fsID=5168; Internet; accessed 15 October 2014.

[99] Rachel Lea Heide, "NATO Air Training Plan." *The Encyclopedia of Saskatchewan*, n.d. Available from http://esask.uregina.ca/entry/nato_air_training_plan.html; Internet; accessed 5 Oct 2014.

[100] Department of National Defence website, "Backgrounder: Canada's Flying Training History…

[101] Office of the Auditor General of Canada website, "2006 May Status Report of the Auditor General of Canada," Chapter 3 – National Defence – NATO Flying Training in Canada. Available from http://www.oag-bvg.gc.ca/internet/English/parl_oag_200605_e_1118.html; Internet; accessed 25 August 2014.

in the program.[102] Commitments from Denmark and United Kingdom were sufficient to facilitate program launch with the expectation that more nations would follow. These initial launch nations were indeed followed in 2000 by Italy and Singapore.[103]

While the achievement of economies of scale was a cornerstone of NFTC from the outset, the program was designed with mechanisms to facilitate expansion.[104] This was not the only rationale for a flexible structure given that DND intended to be well positioned to capitalize on variations in Allied jet pilot demand and ENJJPT capacity. According to DND, "NFTC ensures that there will be flexibility in accommodating fluctuations and surges in NATO jet-pilot training requirements."[105] There were two types of customers envisioned for the program. The first was the short-term customer who required a limited number of slots over a relatively short time period of a few years. In order to oblige the short-term customer the program would capitalize on excess capacity or rather existing capacity that was not fully sold to current customers. An example of this type of customer was Austria who signed for six jet training slots over a three year period (two per year) to fill a short-term training requirement as they transitioned from a legacy fleet to the Eurofighter Typhoon.[106] Even for an agreement of

---

[102] *Ibid*.

[103] Office of the Auditor General of Canada website, "2002 September Status Report of the Auditor General of Canada"…

[104] The NFTC contract was designed and business cased from the start to include sales to customer air forces. It is important to note that BI made no direct sales to any party other than to the Crown. Sales were made via Memorandum of Understanding between the RCAF and the customer air force. The Crown would then purchase the required training to fulfill the MOU via the CSA with BI.

[105] Department of National Defence website, "Backgrounder: Canada's Flying Training History"…

[106] CSA, Group A Sub-Schedule R-3 Austria – Austrian Training Requirements, Amendment 11 (2008).

such relatively short duration Austria was required to either provide Qualified Flying Instructors (QFIs) or to reimburse the program financially.[107] The second type of customer was one who subscribed long-term to the program. An example of such a customer was Hungary who signed on to the program in 2002 and whose training commenced in 2003. Hungary purchased several training slots per year over the remaining life of the contract. The numbers of students required by Hungary triggered a purchase for additional aircraft as the requirement exceeded existing excess capacity.[108] Additionally, Hungary was required to provide QFIs at a pre-determined ratio in relation to the numbers of students. Therefore, there were built in provisions to add QFIs and aircraft to the program with the signing of new nations in order to ensure that there were sufficient resources to meet the training demand.

There was also a provision to add FTD resources to the program in the form of the Additional Asset Reserve Fund as new customers joined the program. This financial provision within the contract allocated a certain portion of the training fee program to be directed toward program improvements. One of the envisioned areas of enhancement was that once enough student training was sold there would be sufficient money available to purchase additional FTD assets. This fee was applied to NFTC customers who signed

[107] Participating nations are required to provide QFIs in a ratio of QFI to students depending upon the phase of training. If the nation either cannot or does not wish to provide QFIs then they must reimburse the program financially so that the required numbers of QFIs can be sourced from another nation at no financial cost to the nation that provides the QFIs. This is the "Hired Gun" concept utilized in NFTC.

[108] As a result Milit-Air purchased three Hawk and two Harvard aircraft, valued at $106 Cdn million via an additional bond sale at 5.87%. These aircraft were known as Series 2 assets; assets required as a result of the training demand of a new program signatory. These are differentiated from the initial purchase of assets and the associated bond sale which were termed Series 1 assets as per the CSA, Schedule R-14 Series 1 Assets and Series R-15-1 Series 2-1 Assets Amendment 7 (2002).

after the initial four launch customers.[109]

Weaknesses of the NFTC Program

The NFTC contract also included several contractual weaknesses. The three primary problem areas were: the complex nature of tuition fees, high levels of government guaranteed revenue and several invalid initial resourcing assumptions. All of these weaknesses were to have negative impacts which inhibited the success of the agreement from the perspective of DND and the prime contractor.

The structure of tuition fees was necessarily impacted by the requirement to pay the capital asset leasing fees. In fact, tuition fees consisted of five different kinds of fees payable: transition fees, firm fees, firm fixed fees, variable fees and cost reimbursable. Transition fees related to costs associated with program start-up from 1 May 1996 until all training phases were loaded and running. Firm fees relate to the maintenance of aircraft and the administration of program related infrastructure. Firm fixed fees relate to the lease principle and interest payments to Milit-Air related to the bonds used to acquire the capital assets. They are payable semi-annually for the 20 year life of the program. Variable fees are related to aircraft spare parts, consumable spares and engine overhauls and lastly cost reimbursable relating to fuel, oil and oxygen.[110] This multitude of fees made the financial aspects of the contract difficult to grasp outside the small group of dedicated financial officers who administered the program.

Even the complex series of fees which described tuition fees provides only a

---

[109] Canada. Public Works Government Services Canada. "Canada Services Agreement in Support of the Training of Canadian Military Pilots between Her Majesty the Queen in Right of Canada and Bombardier Inc.," 100-101.

[110] Office of the Auditor General of Canada website, "2002 September Status Report of the Auditor General of Canada"…

simplified view of NFTC costing. In fact, each user paid differing tuition fees depending upon when they joined the program, as a result of differing periods to cover capital amortization, and the number of students enrolled by the nation which could trigger a requirement for increased capital assets to cover the increased training assets.[111] Initially the concept was one in which a simplified costing could be provided based on a fully calculated "power by the hour" valuation which considered all aspects of the requirements of student training.[112] This concept was very difficult to calculate as the price of the flying hour depended on who was flying it, where and using which aircraft. All of this complexity made marketing challenging in that the potential customer requested a price before making a commitment, however, an accurate price was difficult to generate until a commitment was made. This is notable because the previously discussed government unconditional guarantee of the lease payments meant that these payments are owed whether or not Canada trains the number of pilots to which it is entitled. Specifically, even if no training whatsoever were to be conducted Canada would still be obligated to 79% of the overall program costs.[113] The risk is that the contractor could be unable or choose not to deliver the range and number of services required. In such case, while seeking costly and lengthy legal recourse, Canada would still be responsible for the approximately $1.3 Cdn billion associated with the firm fixed fees.

Tuition fees and costing were not the only complex issues in NFTC. One of the

---

[111] In addition, aircraft fatigue life and engine thermal cycle impacts, wear and tear, resulted in differing costs per phase of training such that a Hawk jet training aircraft hour flown at 15 Wing Moose Jaw was charged at a different rate that the same hour flown at 4 Wing Cold Lake.

[112] These items included the following: housing, rations, Aviation Life Support Equipment (ALSE), grounds school, FTD hours, flying hour related costs and several others.

[113] Office of the Auditor General of Canada website, "2002 September Status Report of the Auditor General of Canada"…

largest detractors that has inhibited program success from both a DND and contractor perspective is that several of the base assumptions upon which the contract was built were incorrect or optimistic. These invalid assumptions led to an overall under resourcing of the program. The fundamental problem was that, in order to keep costs down, the program was resourced to the mean of demand instead of to the peak.

Flawed Assumptions in the NFTC Contract

There are several examples of false assumptions leading to inadequate resourcing in the program. However, in order to begin this discussion it is critical to understand that while a vast and varied amount of support is required to sustain and maintain a flying training operation, there are three very expensive key assets. The key assets, that will either facilitate or prevent the success of such an operation, are: aircraft, FTDs and QFIs. To calculate the requirement for these key assets there are preliminary assumption areas upon which the resourcing decisions are made. Some of these assumption areas are as follows: the flying training day calendar (FTDC), aircraft capabilities, Training Plan (TP) effects upon FTD utilization and availability, QFI manning, proficiency hours, sortie generation paradigm and contractual sole sourcing.[114]

The FTDC is almost certainly the key assumption upon which all other factors are based. The FTDC refers to the number of days per year that provide weather sufficient for flying training which are termed flying training days. Days that are not suitable for training are termed bad weather days. The calendar is created based on thirty years of historical weather data for the training site. In the case of NFTC the two training

[114] This list is not all encompassing as there are other examples of flawed assumptions. Additional examples are: differences between weather at the Jimmy Lake weapons range and at 4 Wing Cold Lake, lack of winter daylight hours at 4 Wing thus limiting 419 Sqn to a three wave operation during the winter months and Maple Flag which limits 419 Sqn to three waves during this major May-June exercise.

sites are 4 Wing Cold Lake and 15 Wing Moose Jaw. Given that both of these sites have been used for training over a period of decades there was extensive weather data available. The other factor required in the flying training day calculation is the weather requirements of the particular phase of training or mission. In general, *ab initio* or pre-Wings standard training phases require better weather than post-Wings training phases. This is because as trainees progress through the various phases, their ability to adapt to differing weather limits increases and hence weather requirements generally decrease. Also *ab initio* training phases concentrate on developing basic pilot skills during which time better weather is desired so that training time can be focused on skill development with a reduced impact of adverse weather conditions.

In the case of NFTC *ab initio* training phases, those conducted at 15 Wing were scheduled based on a 175 FTDC and the post-Wings phase at 4 Wing was based on a 192 FTDC. This was the same FTDC applied to Tutor training in Moose Jaw and CF-5 training in Cold Lake, the previously used legacy airframes. However, over time this assumption was proven to be substantially inaccurate. The inaccuracy was largely due to the different capabilities of the pre and post-NFTC aircraft.[115] Clearly, given the differing capabilities of the airframes, the FTDC must be different. In fact, *ab initio* phases, utilizing the Harvard, now operate with a 168 day FTDC. Part of this difference is a result of differing capabilities and part is a result of more accurate weather modelling that reflects changes in trending weather patterns over the last ten to fifteen years. Therefore,

[115] For example, the RCAF operated the Tutor with a crosswind limit of twenty-five knots (kts) for trainee solo missions and with a crosswind limit of thirty-five kts when the mission was conducted with a QFI (termed a "dual" mission). In the case of the Harvard, the initial crosswind limit for the airframe, both dual and solo, was sixteen kts. Later in the program these limits were expanded, after being proven safe, to fifteen kts for trainee solo missions and twenty-five kts dual. Moreover, the Tutor was authorized to penetrate a cloud layer of 5000 feet containing light to moderate rime icing while the Harvard is not authorized to operate in icing conditions.

from a mathematical perspective utilizing a 175 FTDC for *ab initio* Harvard phases would lead to the assumption of requiring less aircraft than were actually necessary to complete the training.

Another key assumption relates to FTD utilization rates. The method used to calculate the number of FTDs necessary was based on the total number of FTD missions required. Therefore, the number of FTDs included in the Training Plan (TP) was multiplied by the number of students training slots sold and then divided by the number of working days. The number of working days was used vice flying training days as the assumption was that FTDs would be completed on bad weather days. Thus, the assumption was a smooth consistent FTD utilization rate which spread the required work over a longer period thus reducing the resources, in both staff and physical assets, necessary to be able to fulfill the requirement.

However, such thinking ignores the realities of a TP in which virtually each flight has a pre-requisite FTD mission. This fact, coupled with student course commencements that are done in groups of students to minimize ground school instructor requirements, often overwhelmed the available Harvard FTDs. Thus, the reality is that given the TP mission flow, FTD utilization was a peak-valley paradigm. This was problematic from multiple perspectives in that it made FTD instructor manning, a contractor responsibility, extremely difficult as the contractor was loathe to man to the peak as often not all of the instructors were required during the valley. But, when students could not complete an FTD because of lack of availability, they then could not complete the associated flying mission which meant that available aircraft were not flown. So despite the fact that numerically sufficient FTDs may have been available during the year, they were not

always available at the right time which directly decreased program efficiencies.

There were several issues that negatively impacted the success of the QFI manning assumptions. One was an incorrect assessment of QFI availability which led to the utilization of a three to one student to QFI ratio. This was based on the assumption that QFIs would minimize professional development courses, deployments, and duties not directly related to flying. Since operations began there has been a steady rise in the number of QFIs actually required. This has been exacerbated by regulations changes which now provide RCAF members with up to twelve months of Maternity Allowance or nine months of Paternity Allowance which reduces the available trained effective strength of QFIs.[116]

Early in the program there was recognition of insufficient QFIs to complete the training requirement.[117] As such, the Centre for Operational Research and Analysis, later to be known as Operational Research and Development, from 1 Canadian Air Division was commissioned to development a resource allocation model (RAM) for NFTC. This modelling took several iterations to refine given changing QFI obligations and availability. Nevertheless, the QFI to student ratio is now set at two to one. Therefore, part of the issue in this case was a series of developments and changes in regulations which occurred early in the program which altered previously established assumptions.

Another factor that was to have profound impacts upon resourcing decisions and

---

[116] Canada. Department of National Defence. DAOD 5001-2, *Maternity and Parental Benefits*. Available from http://www.forces.gc.ca/en/about-policies-standards-defence-admin-orders-directives-5000/5001-2.page; Internet; accessed 21 October 2014.

[117] Office of the Auditor General of Canada website, "2002 September Status Report of the Auditor General of Canada"…In 2001, 2 CFFTS recommended an increase in the number of QFIs to eighty which was an increase from the allocated sixty. By early 2002 the manning level had been increased to seventy-one and has continued to slowly increase over the duration of the program.

upon program success was the sortie generation paradigm. This is more colloquially termed the “wave pattern”. It was determined that given the sold training slots and the utilization of a 175 FTDC, the Harvard program required eighty-one sorties per day. As well the contract was designed around a ten and one half hour flying day as a baseline for the manning and resource allocation of the sub-contractors. Any desire to extend this time period required both funding and negotiation between DND, the prime and the sub-contractors. This led to a paradigm of a five wave program which helped reduce the number of aircraft required in order to provide the required sorties. For example, this number of sorties could be provided in four waves of twenty-one aircraft or five waves of seventeen.

NFTC QFIs are assumed to conduct two airborne missions per day. QFIs generally fly first and third wave or second and fourth waves leaving the fifth wave to be filled with student solo missions or other missions like proficiency which require a QFI. The difficulty of fully manning the fifth wave resulted in a situation where the program was calculated for five waves but was really only capable of utilizing four plus. In addition, in the NFTC paradigm two instructional missions normally require eight to nine hours; any time required for secondary duties, personal administration, physical fitness, mandated online courses or professional development is in addition to the eight to nine hour work day. This makes two missions per day difficult for QFIs to sustain over the long-term. Therefore, from the outset the fifth wave was problematic from a manning perspective and the program should have more correctly been designed to be either a four wave program, requiring more aircraft, or a six wave program, requiring more manning.

QFIs require dedicated flying time each year to guarantee a high level of

proficiency. This ensures that the trainee is exposed to a high flying standard to emulate and to compensate the QFI from a skills perspective for the high level of their flying time during which the trainee will be flying the aircraft. Given that NFTC was built for expansion, proficiency hours were associated with each trainee flying slot. Hence, as more trainee slots were sold, more proficiency time would be available for the increase in QFIs required to instruct the new trainees. However, the number of proficiency hours associated with the slots was relatively low and was based on calculations from the pre-NFTC paradigm.

In 2000, 1 Canadian Air Division proficiency hour requirements were significantly increased for all units. Based on the sold slots NFTC had available, the built-in proficiency hours accounted for approximately 40% of the revised requirement.[118] In order to compensate for this gap trainee slots were converted to proficiency hours. This significantly reduced the number of slots available for student training. As an example, Canada had purchased 131 Phase 2A slots but utilized on average sixteen slots to augment available proficiency hours to meet the 1 CAD minimums. This was one of the primary reasons that NFTC production goals were not met during the first twelve years of the program.[119]

---

[118] Canada. Public Works Government Services Canada. "Statement of Work SOW 9177 for the NATO Flying Training in Canada (NFTC) Program." 30 April 1998 and incorporating revisions to 19 December 2008, A-38.

[119] These flawed assumptions led to a downward spiral in relations between the RCAF and the contractor. As a result of capacity issues because of the flawed assumptions, RCAF student loads were not at the expected levels. This created a situation in which the contractor was burdened with a revenue shortfall in the tens of missions of dollars as a result of unflown hours. In May 2011, the contractor advised the RCAF that it was restricting services, including surge, to the contracted minimum according to the contractual interpretation of the contractor. As a result the RCAF initiated a Tiger Team to examine the impacts. The Tiger Team was also tasked to derive a solution, within the bounds of the newly contractor interpreted resource availability, to increase production given pilot shortfalls in the face of reduced capacity at NFTC. The outcome was a revolutionized pilot training paradigm including end to end changes in Pilot Candidate Recruitment, Aircrew Selection methodology and training philosophy at both CFTS and NFTC.

Another problem area was the sole-source nature of the NFTC contract. DND submitted a sole-source justification on the belief that the BI led consortium included all of the contractors that had bid as prime contractors on the 1991 CFTS contract. Thus, DND was satisfied that the consortium represented the only qualified bidder. As well, the industry team was the entity that had expressed a committed interest in the program. There was also the belief that because of the lower competing cost of ENJJPT and the high level of cost scrutiny exercised by potential customer nations, a situation was created in which BI was strongly incentivized to keep costs low. DND also stated that the sole-source route was the only path able to meet the NATO imposed timeline.[120]

Though there was concern regarding the sole-source approach the program continued.[121] This was despite the findings of the OAG that neither the sole-source justification nor the PWGSC direct negotiated profit margin met government contract regulations.[122] In reality, in the case of a twenty year services agreement the contract is *de facto* sole-source even if a competition is held to select the *de jure* service provider. This fact is a result of the very high levels of guaranteed revenue within the contract and the high termination penalties; the RCAF is tied to the winning service provider. Even in the event DND elected to exercise the right of termination within the CSA the resultant costs could be as high as 79%, the guaranteed portion of the remaining contract value.

Implemented in 2012 the revised system is now producing approximately 115 NWG at minimal increased cost from a system that had previously averaged 85-90 NWGs per annum. Of note the cost, had the pilot training paradigm not been changed, to reach a production level of 115 NWGs per year (combined between NFTC and CFTS), was estimated to be a minimum of $800 Cdn million over the remaining life of the NFTC contract (2011-2021).

[120] Office of the Auditor General of Canada website, "1999 November Report of the Auditor General of Canada,"…16.

[121] *Ibid.*

[122] *Ibid.*, 23.

NFTC – Conclusion

NFTC is as an innovative program that incorporated a public-private partnership in which DND avoided the pitfalls of a high profile capital project during a time of restraint. This was in keeping with the direction desired in the 1994 White Paper and allowed the RCAF to dramatically update and modernize its pilot training system. In addition, expansion of the program via sales to allied air forces was a key tenet. Such sales were needed to achieve sufficient economies of scale to make the program viable. The TB approval included authority to conclude sales of training services to the benefit of DND and the Canadian economy. The CSA itself contained built in mechanisms to ensure sufficient resources in the event of expansion. All of this contributed to a high quality training system.[123]

The primary flaws in the contract lay in the capital asset paradigm and critical assumption faults related to the three key resources. These problems created production difficulties. In fact, according to the CRS Audit in 2012, production between 2001 and 2010 never exceeded more than 74% of the target output.[124] The paradigm used to purchase the capital assets obligated Canada to pay for training regardless of delivery. There were also faults in the resourcing assumptions in critical areas such as the following: FTDC, aircraft capabilities, TP effects upon FTD utilization and availability, QFI manning, proficiency hours, and the sortie generation paradigm.

---

[123] MGen C. Bouchard, *NATO Flying Training in Canada (NFTC) Program Performance* (17 Wing Winnipeg: file number 2455-3 (A1 Trg), 8 June 2005).

[124] Department of National Defence website, Chief of Review Services, "Evaluation of Aerospace Training and Readiness…

Contract Flying Training Support

In 2005, DND gained approval[125] for a twenty year, plus two year transition period, $1.77 Cdn billion contract with Allied Wings, a unit of Kelowna Flightcraft, to provide support services for pilot training to the Crown.[126] The total contract value, including escalation during the life of the contact and transition funding, approached $2.3 Cdn billion.[127] While there are many similarities with NFTC there was an attempt to integrate the lessons learned during the first years of that contract.[128] Therefore, by examining the history of CFTS and its strengths and weaknesses we can better situate our consideration of any future pilot training contract.

CFTS Background

In 1989, the Crown announced a series of military base and installation closures in an attempt to reduce the deficit and slow debt growth.[129] This was followed by the announcement of the intent to close CFB Portage La Prairie later that same year and to cease military flying training operations.[130] DND began an effort to rejuvenate its

---

[125] Approval required for funding from Program Management Board (PMB) and spending authority from Treasury Board (TB).

[126] Contracted Flying Training and Support, contract.

[127] Paul Samyn, "Portage Contract $2.3 Billion Windfall," *Winnipeg Free Press* (22 March 2005). Available from http://www.shindico.com/index.php?option=com_content&view=article&id=115&catid=5&Itemid=26; Internet; accessed 27 October 2014.

[128] Office of the Auditor General of Canada website, "2002 September Status Report of the Auditor General of Canada"…

[129] Wilson, Honourable Michael H. *The Budget Speech 1989* (27April: 1989), 6. Available from; http://www.budget.gc.ca/pdfarch/1989-sd-eng.pdf; Internet; accessed 23 October 2014.

[130] Department of National Defence website, "Backgrounder: Contracted Flying Training and Support," (30 March 2005). Available from http://www.forces.gc.ca/en/news/article.page?doc=contracted-flying-training-and-support-cfts/hnocfoke; Internet; accessed 5 August 2014.

primary and helicopter flying training which had seen little change in many years. There was also discussion related to the creation of a multi-engine flying training phase.

In 1992, following a competitive bidding process, BI began delivering training for a five–year term that also included two optional one year extensions, both of which were exercised. Under the terms and conditions of the contract BI provided primary flight training including flying instruction, new aircraft and ground school. BI also provided maintenance for new CFE multi-engine aircraft and loaned DND aircraft for the helicopter pilot training. In addition, BI provided the full-scope of airfield operations activities under agreements with several sub-contractors and the newly formed Southport Aerospace Centre Incorporated. This brand new, locally owned not-for-profit, economic development agency was created in the same manner as had the not-for-profit management corporations that had assumed responsibility for other former DND bases.[131] Several contract extensions were concluded following the preliminary term.

This initial experience was viewed by the RCAF as an innovative method to accessing new aircraft and modernizing training in a restricted financial environment. Following the template of the initial CFTS contract, all desired ASD services were contracted out to a prime contractor. Therefore, the RCAF decided to continue with the paradigm of the public-private partnership employed in the follow-on CFTS contract and in NFTC.[132]

---

[131] Department of National Defence website, "Backgrounder: Contracted Flying Training and Support," …

[132] "Canadian Forces Seek to Build Excellence in Foreign Flight Training," *Defence Industry Daily*, (22 February 2011). Available from http://www.defenseindustrydaily.com/canadian-forces-seek-to-build-excellence-in-foreign-flight-training-01537/; Internet; accessed 29 October 2014.

CFTS Similarities to NFTC

There were many similarities between NFTC and CFTS. Primarily, the two contracts share an outsourcing paradigm in which the Crown contracted broad support services to a single prime contractor and both contracts facilitated a pervasive modernization of their respective components of the pilot training system.

Both programs employed a civilian corporation as a prime contractor. In this role AW and BI were responsible to provide all contracted services. Some of these services were provided by AW and BI themselves and others were provided by sub-contractors. The concept of a prime contractor relieved the RCAF and the Crown from managing multiple agreements with several companies. In essence, the RCAF paid a service fee for a civilian entity to manage sub-agreements with other civilian companies. This concept was in harmony with the ASD philosophy of reducing personnel impacts by outsourcing administrative and management functions. However, the disadvantage is that another layer of profit was required. While the sub-contractors included profit in their agreements with AW and BI, profit was then included again by the prime contractors for management services.

As was the case in NFTC, one of the main advantages of the ASD option was a recapitalization of training assets and infrastructure. Under the terms of the CFTS contract, AW provided many new capital assets in order to modernize and update the training provided at Southport. AW committed to purchasing, via CFE, Grob G120A aircraft for primary flying training and Beechcraft King Air C-90Bs for multi-engine flying training. Unlike in NFTC, the new assets were purchased directly by the prime contractor vice through a third party not-for-profit entity. However, in order to achieve

better financial terms for AW the Crown acted as an underwriter for the loans required to purchase the CFE capital assets. As for the GFE component, DND supplied both Bell 206 Jet Rangers for basic helicopter training and several militarized Bell 412CF Outlaw helicopters in order to introduce more advanced helicopter training.[133] AW was also responsible to purchase new simulators to allow an increased level of synthetic training than in the past. AW was responsible for all tasks related to primary flying training. RCAF QFIs were to provide flying instruction for helicopter and multi-engine training while AW and its subcontractors were responsible for ground school instructors, courseware, flight services and the aircraft for multi-engine and rotary (helicopter) training. In keeping with the theme of modernization AW constructed new aircraft hangars and an 80000 square foot training complex.[134] Thus, overall the two contracts shared a similar paradigm with respect to overall structure and concept.

Strengths of the CFTS Program

In examining the resultant training program it is clear that there are many aspects of the CFTS program that were advantageous to DND and there are several key programmatic benefits that CFTS shares with NFTC. These benefits include the following: compliance with government ASD policies and aims, reduction of uniformed personnel requirements and fleet modernization in a difficult capital project environment. In addition, CFTS has several strengths that are largely the result of lessons learned from

[133] This was a departure from the long-standing methodology of helicopter training teaching core skills on a basic training platform. The course length was significantly lengthened and the addition of the second more advanced platform essentially created a basic and advanced helicopter training plan. The aim of this increase in training was to increase common core skills and concomitantly reduce the amount of training required at the more expensive Operational Training Unit level of training.

[134] "Canadian Forces Seek to Build Excellence in Foreign Flight Training,"…

the NFTC experience which are greater flexibility to facilitate change in the work, Variation in Quantity (VIQ) provisions and the implementation of a Performance Incentive Fee (PIF).

CFTS shared many of the strengths of the NFTC program. In much the same way as NFTC, CFTS fulfilled the Crown's principles of ASD. The program was viewed as a boon to the local community and to the province of Manitoba by creating dozens of new high-paying steady jobs.[135] Local politicians and business people believed it to be the culmination of a long protracted campaign to keep the base open, contrary to DND planning. In fact, the awarding of the CFTS contract to AW was an improvement upon the level of activity conducted at the Southport facility.[136] At the same time the program met DND's dual aims of retaining domestic military flying training and reducing the number of uniformed military personnel. In addition, there was a significant modernization of the capital assets used in the training program. Of special import was the induction of three advanced simulators, two of which, one for the Outlaw and one for the King Air, had full motion capability.[137] The efficacy of the overall program was greatly increased as these highly capable simulators decreased the reliance of the program on favourable weather to conduct training. It also greatly expanded the envelope of tasks which could be rehearsed on the ground prior to going airborne.

Given that CFTS commenced several years after NFTC there was an attempt to apply lessons learned to the newer contractual arrangement. These included the

---

[135] Paul Samyn, "Portage Contract $2.3 Billion Windfall,"…

[136] Kevin Rollason, "Aviation Training Centre Takes Flight," *Winnipeg Free Press* (14 September 2007). Available from http://www.winnipegfreepress.com/historic/32410714.html; Internet; accessed 30 October 2014.

[137] *Ibid.*

following: greater flexibility to facilitate change in the work, VIQ provisions and the implementation of a PIF. The overall aim of these changes was to increase contractor incentive and flexibility that was felt to be lacking in the NFTC context.

An example of this ability to facilitate and implement change was that the training concept at CFTS significantly evolved in the early years. There was provision in the base CFTS contract for three slots per year for a Phase II Grob which was initially termed Phase I Extended. The provisions of the base contract were expanded in a five year amendment as a result of Phase II training production shortfalls at NFTC.[138] The aim of this $50 Cdn million contract addition was to replicate the training at NFTC and it was considered sufficient to continue onto the helicopter or multi-engine training. It was not, however, considered completely equivalent such that graduates could continue on to fast jet training at NFTC. The amendment included the creation of a Grob FTD as such training was considered integral to Phase II training. One of the more interesting elements of the amendment implementation was that the company agreed to work "at risk" for two years before negotiations ended and the amendment was signed. During this time missions programmed in the TP for the FTD were flown in the aircraft.[139] Thus, the programs became even more similar and symbiotic, one feeding the other and vice versa, as the overall training evolved from a programmatic perspective. There were several other examples such as the increase in Phase I training from 113 to 140 students[140] as a

[138] Department of National Defence website, Chief of Review Services, "Evaluation of Aerospace Training and Readiness Part 1 – Air Force Initial Occupational Training,"…

[139] Canada. Public Works Government Services Canada, "Contracted Flying Training and Support," Amendment 25.

[140] This was a result of the TP analysis done by the Tiger Team in 2011.

result of a completely revised training plan produced by the RCAF.[141] As well, due to a significant shortage of available helicopter pilots, airborne instruction of the Basic Helicopter Course (BHC) was also added to the list of AW delivered services from 2009 to 2013.[142] From these examples it is clear that there was significant evolution in the CFTS program training plan.[143]

In addition, there was the inclusion of a mechanism to create course loading flexibility that could be exercised by the Technical Authority (TA)[144] without significant contractual negotiation. In the NFTC paradigm the number of training slots per phase was fixed within the contract. If in any given year the RCAF wished to increase the number of slots the available capacity would have to be contractually verified and a price negotiated which was often a very lengthy and challenging process. As a reaction to this situation, the CFTS contract included a mechanism known was VIQ. At the heart of this concept was the ability of the RCAF to increase or decrease the annual volume of a contractual

---

[141] The number of Phase I slots has since been contractually increased to155.

[142] Canada. Public Works Government Services Canada, "Contracted Flying Training and Support," Amendments 21, 27, 29, 37, 43.

[143] The CFTS contract has been amended 48 times from contract commencement to end 2014.

[144] In the CFTS and NFTC Contracts there are four authorities responsible for different aspects for quality assurance and quality control. The TA resides at the strategic level in Ottawa at the RCAF Directorate of Air Simulation and Training. The TA is responsible for matters concerning the technical content of the work under this requirement. In addition, any desired changes must be discussed with the TA prior to implementation. The Training Management Authority (TMA) resides in Winnipeg at the RCAF Headquarters, A3 Training. The TMA is responsible for the training standard, the qualification standard and qualifications of instructor personnel. Any changes to any training plan had to be discussed with the TMA prior to implementation. The DND Procurement Authority was responsible for all procurement and financial activity related to the contract on behalf of DND. Finally, the CA is PWGSC. It is responsible for the management of the contract on behalf of the Crown. Any change to the contract or the work must be authorized by PWGSC and the contractor is not to undertake any work in excess or out-of-scope to the contract without prior agreement with the CA. Lest this appear complex it must be understood that on top of this structure were DND Legal and PWGSC Legal which provide advice to their respective customer agencies and the Contractor Representative, AW, which must also consider its parent company, KFL, their legal advisor and their insurers. The process to embody a change was lengthy as a result of the presence of so many stakeholders.

task by 10%. Therefore, using Phase I as an example, the RCAF could increase the annual loading from 113 to 124 at no additional cost. This flexibility could be exercised in any CFTS flying training phase or supporting contractual task. There was, however, some protection for the contractor revenue stream in that if the quantity was reduced in any given year by 10% or less then the RCAF was not entitled to a refund. Therefore, as a result of VIQ the RCAF could load anywhere from 102 to 124 Phase I slots with no change in cost. The only notification required for such a change was via an annual production forecast letter to the contractor.[145] This mechanism increased the ability of the RCAF to react to short-term fluctuations in training requirement for any reason without variations in funding obligations.

In another divergence from the NFTC paradigm, CFTS embraced the concept of a PIF. PIF had been employed in other DND contracts such as the 5 Wing Goose Bay support services contract with multi-national SERCo.[146] The foundational concept was that a reduced profit level would be paid for delivering the requirements of the Statement of Work (SOW) and that a PIF would form the majority of the contractor's profit. Therefore, the aim was that the contractor would be highly motivated to "provide excellent performance in identified areas of emphasis."[147] The incentive was significant to the contractor as the total value available over the life of the contract was $57.5 Cdn

[145] Canada. Public Works Government Services Canada, "Contracted Flying Training and Support," Section 9.0 Variations in Quantity of Work (VIQ).

[146] Canada. Public Works Government Services Canada, "Annex D Performance Incentive Fee Plan Revision-2, Goose Bay Support Services Contract," (1 October 2006).

[147] Canada. Public Works Government Services Canada, "Contracted Flying Training and Support," Section 10.7 Performance Incentive Fee.

million or an estimated $73.27 Cdn million including estimated escalation.[148] The hypothesis was that the contractor would make only a small profit for delivering the SOW but that the PIF would encourage innovation, excellence and flexibility. In reality, this aim was largely achieved in that the contractor expressed a strong desire to obtain the highest possible PIF reward.[149] As a testament to the level of positive incentive the contractor garnered by virtue of the PIF, AW shared a portion of the reward with their employees in order to encourage a high level of participation. AW correctly surmised that this motivation increased the odds of a higher overall award. An example of this motivation was the tendency of the contractor to accept work or adjustments to the SOW on an "at-risk" basis as a demonstration of collaboration and flexibility. While there were challenges associated with the administration of the PIF, it is clear that overall the PIF was an effective tool in managing the CFTS contract and positively influencing the contractor.

Weaknesses of the CFTS Program

The CFTS contract also includes several problem areas. The primary issues are high levels of PIF administration requirements and a lack of flexibility for marketing. From the perspective of DND these weaknesses had a negative impact upon the overall success of the agreement.

While it is accurate to describe the PIF as a positive to the CFTS program, the administration of the fee was labour intensive and a source of friction between the RCAF and the contractor. There are two semi-annual meetings termed Performance Incentive

[148] Canada. Public Works Government Services Canada, "Contracted Flying Training and Support," Section 8.4 Performance Incentive Fee.

[149] This fact was determined from the results of a Contractor Survey of the prime contractors for CFTS and NFTC.

Fee Board (PIFB).[150] This group receives presentations from both the contractor and the Performance Evaluation Team Chairman[151] which each outline their perspectives with respect to what portion of the available PIF the PIFB should grant to the contractor. In addition, the PET is required to collect data on a monthly basis from numerous tactical and operational level Subject Matter Experts (SME) termed Performance Monitors (PM). The PMs are tasked to observe and monitor a specific area of the SOW and report to the PET. At the monthly meetings the PET and the contractor do their best to validate all of the observations and to clarify any contentious areas. At the end of the six month PEP the PET collates the monthly reports into a detailed draft report which includes all of the observations for the period and a recommended score for presentation to the PIFB. During the process there are several opportunities for contractor input and perspective. The PIFB then determines what percentage of the PIF that the contractor should receive for the period. There was also a follow-on process during which the contractor can request a further consideration of the PIFB.[152] These are all secondary duties for existing personnel with no additional person years allocated to specifically account for this large volume of administrative tasks.

Another area of prolonged disparity, within the context of PIF, centred on the Performance Criteria (PC). According to the CFTS Contract Annex F, the PC allow the

---

[150] The Performance Incentive Fee Board is a Director level group (Colonel Equivalent) which consists of several representatives of various government stakeholders. The PIFB is co-chaired by the Director of Air Simulation Training and the Director Maj Procurement Services. Other members consist of PWGSC, Director Air Force Training and Commander 15 Wing.

[151] The Pet Chair is the Program Director CFTS. This is the responsibility of DAST 2 which is a Lieutenant Colonel position.

[152] Canada. Public Works Government Services Canada, "Contracted Flying Training and Support," Annex F, CFTS Performance Incentive Plan.

RCAF to provide the contractor with desired areas of focus to improve overall delivery of service.[153] Early in the contract the PIFB purposefully elected to maintain general areas of focus based on the hypothesis that it would limit contractor initiative and ingenuity if the PC were too specific. However, the contractor desired PC which were as specific as possible so that efforts could be properly focused. The aim was to produce the most positive observations and hence the largest possible PIF award for the contractor and its employees. It took a number of PEPs for reality to take hold in this regard and for the positive impact of PIF to become effective.

Another problematic area of the CFTS contract was the lack of flexibility for marketing. Initially the program was heralded as the next logical step for the RCAF to solidify its position as "international center of excellence for foreign military aviator training."[154] In 2005 a top official of AW stated that while NFTC was the linchpin of Canada's international flying training, "…the missing ingredient was really a marketable primary, multi-engine and helicopter training component."[155] Such opinion was not only the perspective of industry because, as a National Defence Backgrounder of 2005 clearly stated, while the primary objective of CFTS was to provide training to the RCAF, the intention was "to continue marketing the CFTS pilot training program to its NATO, commonwealth and other military allies."[156] Therefore, from the outset of CFTS there was a clear determination on the part of the contractor and the RCAF to actively market

---

[153] *Ibid.*

[154] "Canadian Forces Seek to Build Excellence in Foreign Flight Training,"…

[155] *Ibid.*

[156] Department of National Defence website, "Backgrounder: Contracted Flying Training and Support,"…

and expand the program.

However, unlike NFTC there was no clear authority or mechanism inherent in the contract to facilitate expansion. The aim of marketing within the CFTS context, as stated in Article 22.0 Flexibility for Marketing, is "…to reduce costs and to expand the CFTS program."[157] In fulfillment of this goal, Canada was authorized to market any transient or excess spare capacity. However, the definition of these authorities was not included in the text of the contact. In addition, the TB authority for the program only referred to the sale of excess capacity and there was no authority to expand capacity as a result of a sale. This meant that any sale leading to expansion required an application to TB for expanded marketing authority. Such an application was an arduous process.[158] The contractor was authorized to market training to civilian users but only with the written permission of the TA in order to ensure such a sale would not impugn the delivery of RCAF contracted training. In practice this limited the contractor to sales of training such as those conducted in the Bell 412 FTD after the hours of RCAF training. While such sales did occur they were of minor monetary impact upon the overall program. Therefore, while marketing of training was a stated CFTS goal of both the contractor and the RCAF, the approved mechanisms within the contract were highly restrictive.

---

[157] Canada. Public Works Government Services Canada, "Contracted Flying Training and Support," Article 22.1.1.

[158] In the case of a desired sale of ten Phase I training slots to the Royal Saudi Air Force (RSAAF; this form is used in this paper in lieu of the normal abbreviation, RSAF, to distinguish it from the Republic of Singapore Air Force, RSAF) in 2011, eighteen months was required to achieve a definition of excess capacity with TB. This CFTS element, amounting to less than $1 Cdn million, was the linchpin in a $43 Cdn million dollar sale of training to the RSAAF which encompassed training slots in NFTC and technician training at the BC Institute of Technology. Therefore the lack of expansion mechanism was detrimental to the overall goal of the sale of training services to Allied countries. The agreed to definition of excess capacity was restricted to only that capacity in CFTS available to the RCAF that was not included in the fulfillment of the 113 RCAF paid Phase I training and VIQ.

CFTS – Conclusion

CFTS is the most recent component of the evolution of RCAF outsourcing of pilot training services. CFTS was synchronous with Crown ASD aims such as reducing numbers of uniformed personnel while modernizing training fleets and increasing the utilization of simulation in training. In addition, CFTS encompassed several improvements which resulted from the application of lessons learned from the larger and more complex NFTC. These improvements include increased flexibility to facilitate change in the work, VIQ provisions and the implementation of a PIF. However, the CFTS contract also includes problematic areas such as the following: difficulties resulting from differing levels of risk tolerance amongst the contract stakeholders, burdensome PIF administration requirements and lack of flexibility for marketing and expansion. All of these issues should be considered in the study of a future outsourced pilot training model.

Conclusion

Faced with a challenging political and strategic situation as the twentieth century came to a close, the RCAF outsourced its pilot training system. This effort was concentrated into two large multibillion dollar ASD contracts, NFTC and CFTS. NFTC was in large part a unique and innovative approach to address a decaying training system within the confines of multiple political and financial constraints. The RCAF employed a public-private partnership on a large-scale with a prime contractor providing capital assets and support services. The aim was to create a close and direct relationship with the contractor that could be expanded by foreign sales to the benefit of all parties. However,

fundamental flaws in the assumptions of the contract and the inherent pitfalls of the paradigm limited the productivity and success of NFTC.

The CFTS contract employed a similar contracting archetype but there was an attempt to apply lessons learned from NFTC. There was a concerted effort to increase flexibility by inserting contractual language that facilitated a variance in training quantity at no incremental cost. In addition, PIF was employed in an effort to incentivize the contractor to be innovative, creative and responsive. Although the mechanics of the PIF were burdensome and at times contentious, it was largely successful in motivating the contractor to strive for an environment of continuous improvement.

As the programs are now mature, an examination of their strengths and weaknesses provides insight as to the benefits and pitfalls on ASD as applied in the dynamic pilot training environment. Overall the RCAF has achieved its goal of rejuvenating its pilot training system but there are also important lessons that must be applied in the future in order to ensure success.

CHAPTER 3 - THE CONTRACTOR PERSPECTIVE

Following an examination of CFTS and NFTC it is evident that these large contracts have had a mix of success and room for improvement from an RCAF perspective. The future stakes for the RCAF are high given the large financial outlay required and the duration of the potential agreement. But what is also interesting is that this opinion is shared by the contractors. Therefore, in the vein of collaborative improvement, both prime contractors were consulted to solicit their inputs regarding areas that could be improved in their respective contracts.[159] Queries centred on the contractual construct and the degree to which this fulfilled, or not, their respective corporate aims.[160]

The observations of the contractors are grouped according to the *critical factors*.[161] In order to ensure the best possible outcome for the RCAF in the next contract, it is essential to consider the contractors perspective and feedback. By achieving some understanding of the contractors' business objectives the RCAF is more likely to achieve its future goals.

Capital Asset Acquisition Paradigm

Both CFTS and NFTC utilized a CFE paradigm to acquire program capital assets. From the contractor perspective the main issue was in regard to the definition of requirement as laid out in the SOR and then refined in the SOW. In the case of NFTC, the contractor was directed to purchase the Hawk. As for the turboprop aircraft, the best

---

[159] Allied Wings Director CFTS, series of emails with the author 24-26 November 2014 and Director Programs and Business Operations BMAT, personal conversation with the author, 27 November 2014.

[160] For a complete list of questions see Appendix 2: Contractor Survey Questions.

[161] All material discussed in this chapter was derived from the contractor's responses.

available solution did not meet the requirements for anti-icing or crosswind capability, however, the aircraft was nonetheless accepted by the RCAF. As discussed, the NFTC resourcing model was not adjusted for the revised capability which meant that from the beginning the contractor faced an uphill battle to provide the required sorties. In summary, if a CFE solution is to be employed then the contractor should be free to match the platform to the requirement and that if this is not the case then the initial resourcing assumptions must be adjusted which may increase cost.

Another aspect of the CFE paradigm is the applicability and application of government contracting policy and regulations. For example, the Milit-Air CFE asset paradigm was approved by TB under the rules at the time, but new rules were implemented via the PWGSC Management Manual.[162] Therefore, PWGSC as the Contracting Authority (CA) imposed new regulations upon a twenty year firm fixed contract with no recourse on the part of the contractor. This illustrates a continuing contractor difficulty with the CFE paradigm in such a long-term contract that, as the regulatory landscape evolves, the contractor is expected to react at its own cost which is difficult to account for within its business plan.

Resource Requirements

The contractors had multiple comments related to resource requirements. As previously discussed there are three primary resources: QFIs, FTDs and aircraft. One of the loudest complaints related inability of the RCAF to meet its contractual obligation to

[162] Public Works and Government Services Canada website, "Procurement Management Manual," Available from http://www.tpsgc-pwgsc.gc.ca/biens-property/sngp-npms/bi-rp/conn-know/approv-procure/manuelga-pmmanual-2-eng.html; Internet; accessed 21 October 2014.

provide sufficient QFIs for NFTC and certain portions of CFTS.[163] This issue was, in fact, one of the largest problems early on in NFTC. Military personnel management is such that the process to request and approve a permanent change in unit establishment often takes two years or more as all RCAF priorities must be considered. Therefore, from a contractor perspective, it seemed incongruous to be rebuked for providing insufficient sorties when, had there been more sorties available, there would not have been sufficient QFIs to crew them. As well, because QFI manning was so problematic early in NFTC there was a requirement for near constant surge operations. Thus, there was an RCAF expectation that surge was needed but this greatly increased contractor cost with no reward or incentive to solve what was, at least partially, an RCAF problem.

Surge capability is a function of staffing and assets both of which have long lead times in order to affect a resource increase. The concept of short-term surge capability requires appropriate lead time for the surge as only current assets, including salaried personnel, are available. In order to build a true short-term surge capability an equivalent overcapacity, which is not used when not required, must be available. While a built-in overcapacity makes eminent sense from an operational perspective it also requires extra funding. It is often difficult to justify and obtain approval from the Crown to fund a capacity that is only to be used a portion of the time. However, there are limits to what can be done during extra waves and weekends as overtime staffing and funding create contractor financial pressures. Also, weather and aircraft OEM issues are outside RCAF and contractor control, as denoted in the statistical deviations from the NFTC RAM, which requires the execution of short-term surge capability. As the overcapacity is often

[163] It is noteworthy that the RCAF has maintained a pilot shortage for the duration, thus far, of the NFTC contract. Therefore, the RCAF has been attempting to balance operational and force generation manning demands.

not available, the required capability must be generated from surging the available assets. This approach is costly, only executed with the support of volunteer civilian staff when outside of defined contractual limits and must only be employed when absolutely necessary in order to avoid the programmatic burnout of endemic surge.

It must also be understood that business operates on a *just in-time management* concept. Industry strives for efficiency and maximization of resources which is used to control costs. The application of this concept is that industry does not resource to peak demand unless specifically contracted and remunerated to do so. Industry calculates required resources based upon the degree to which demand can be managed so that less than peak resources are required. This controls costs and is a reflection of the competitive nature of private industry. The result is that the production flexibility desired by the RCAF is often not available as the endeavour is resourced such that anything about average demand is in fact a surge. The contractors agreed that this was a large source of customer discontent although the effect was a reduced price point.

Performance Measurement

Another key subject of trepidation for contractors is performance measurement. Both contractors are involved in long-term fixed price contracts. From their perspective both contracts had performance elements but it was clear to the contractors that cost certainty was the primary driver.[164] However, in the NFTC context, as production difficulties became more pervasive, the RCAF/contractor relationship became challenged. The contract remained firm fixed but the CA took a performance based

[164] This is exemplified in the very nature of 20 year firm fixed price contracts.

approach, threatening penalties and holdbacks for lack of performance but with no concomitant benefits to excelling or exceeding.

Also of issue was the manner of performance measurement. While the predominant performance criterion is the graduation of the planned number of students within intended timelines, measurement of this is extremely difficult. There are a plethora of factors that can negatively impact pilot production, many of which are not within the control of the contractor. For example, the contractor resources the respective program based on a weather model but most years include variances from the mean of the model.[165] In this case it is irrational to hold the contractor solely responsible for deviations. Therefore, accommodations must be made in overall performance measurement but this does not rectify a deficiency in student production from an RCAF perspective. Consequently, there can often be the case where the RCAF is not receiving the required student production however, as a result of accommodation, the contractor is in full compliance with the SOW.

Relationship

Overall one of the biggest challenges is the relationship between the contractor and the customer. It is evident that there is a divergence in interest amongst the main players involved in the contracts. The primary interest of business is profit and customer satisfaction, while the aim of the RCAF is production and, concurrently, the main concern of the CA is to minimize expenditure and to eliminate risk. This disagreement of purpose leads to significant relationship issues in the areas of process and profit.

[165] A weather model calculates averages over a span of years which by definition includes yearly statistical variances from the long-term average. Therefore, the model calculates resources based on the long-term average and not on the statistical variances.

Relationship - Process

From the contractor perspective the Crown is a challenging customer due its *multi-headed nature*[166] and the complex processes involved with the contracts. However, it must be remembered that, in fact, while the RCAF is the end-user, the customer in a legal sense, is the CA. In addition, the contractor often finds it extremely difficult to fulfill the objectives of all the stakeholders. Such a complex environment is not conducive to flexibility and innovation. In fact, even the most benign amendment is costly and time consuming. [167] As a result the contract language is often one-sided and *draconian*.[168] Overall, the structure seems to have been created not only to avoid risk but to eliminate it unlike the commercial environment which manages risk in order to achieve the required objective. This atmosphere does not foster a collaborative problem-solving approach or of bi-lateral risk management.

In addition, another problem area of the contracts was the near constant state of change. This issue is demonstrated in customer contract management. The number of amendments to both contracts is several times higher than that which was forecast in the

[166] As a reminder the RCAF, is only one of the four Crown authorities involved in the contract.

[167] As an example, should tactical level user (2 CFFTS, 3 CFFTS or 419 Sqn), desire a change to a TP they would staff a change to the TMA at the operational level, the TMA would then forward the request to the TA at the strategic level in Ottawa. The TA would then examine the impact of the TP change upon the work as defined in the Statement of Work (SOW) and the contract. The request would then be packaged according to staffing procedures to the Procurement Authority who would then forward the change to the CA. The CA would then either verify if the work was In or Out-Of -Scope with its legal team. At this point the CA would enter into negotiations with the Contractors Representative to price the required work. Once satisfied the Contractors Representative would then verify with its legal team and lenders at which point the contract amendment would be signed and the work could begin.

[168] An example of this would be the previously mentioned outsourcing of flying instruction on the CFTS BHC from 2009-2013. In 2012, the interpretation of the TB Authority for the program allowing civilian flying instruction changed and therefore the instruction on BHC had to be re-militarized. The contractor saw a loss of revenue and employees and viewed with consternation what seemed to be an arbitrary change in policy.

SOW. This has required increased staffing levels within contract departments as well as increased activity generating costing proposals which has resulted in a much higher contractor cost in this area than was anticipated and funded within such long-term firm fixed price contract. In addition, due to personnel rotations for personnel management reasons there are consistency (staff turnover) and qualification gaps (seniority trumps qualifications) with Crown counterparts as compared to the business environment. In essence the constant rotation of Crown decision makers makes contracting with government more challenging and expensive when compared to normal commercial enterprise.

Relationship – Profit

In order to establish and maintain a productive relationship it is important to have an understanding of the contractor's profit drivers. A company's requirement for profit is a function of level of effort and risk. Long-term firm fixed price contracts are low risk for the Crown as a result of increased cost certainty. However, for the contractor these same contracts are high risk and get progressively higher in risk the longer the term of the contract. This risk profile is a result of future cost uncertainties as the amount of unknowns in any project rises with complexity and duration. Therefore, cost buffers are built in by the contractor in order to account for the unknowns. This buffer may in fact turn out to be insufficient in which case this becomes a loss position for the contractor. That being said there is not necessarily a set expectation for profit although as risk rises so do profit requirements.

However, it is clear that in the case of pilot training contracts the revenue structure is dependent upon the number of students loaded on courses and the resultant

flying hours flown. Any reduction in these areas adversely impacts revenue streams and profit. Once a contract becomes revenue negative the contractor is placed in a very tenuous position that cannot help but negatively influence relationships unless there are provisions for adjustments. Such provisions do not exist in long-term firm fixed contracts.

Marketing

Marketing is highly desired by contractors. One of the primary reasons both contractors became interested in these programs was that aviation was a core enterprise within their respective business models. Expanding into military pilot training was a natural extension of their business. The participation of allied nations was considered to be a potential avenue to further expand business relationships within the home country of the allied participant. This strategy was also consistent with the publically declared aims of both programs. In the case of NFTC, the program was launched once the minimum foreign participation was secured but the program's business case was based on the premise of increased foreign participation which never materialized to the degree initially forecast. This has had a drastic impact upon the financial metrics of the program. With respect to CFTS, although expansion was a stated aim of the program, the associated authority was never secured. Therefore, in the opinion of the contractors, marketing was a secondary activity for the RCAF and neither program was exploited to its full potential.

Conclusion

The future pilot training paradigm will no doubt include ASD in some form. As such, it is critical that an understanding of the contractor perspective be considered and incorporated where possible. The current contractors of CFTS and NFTC agreed to

provide input regarding issues they would like to see improved in the future. Their observations were insightful and enlightening. Overall, there is a great deal of difficulty attached to the multi-headed customer aspect of the current pilot training contracts resulting in misaligned priorities and miscommunication. Frustration is derived from the number of stakeholders, the varying interests and the cumbersome contracting policies that reduce overall effectiveness. This issue is exacerbated by a virtual revolving door of RCAF and government personnel involved in the contract administration on behalf of the Crown. Moreover, the contractors find that the zero risk tolerance demonstrated by the CA is detrimental not only to the RCAF's pilot training goals but also inhibits productivity and innovation on the part of the contractor. The most interesting comments relate to the necessity of a proactive and collaborative relationship between the RCAF and its service providers which acts, in military parlance, as a force multiplier.

CHAPTER 4 – LESSONS LEARNED

As key dates approach, the future of the RCAF and its pilot training system is undecided. In examining the background of ASD in Canada and the outsourcing of the pilot training system and the contractor perspective there are lessons that can be captured in consideration of the future paradigm. These lessons are categorized according to the *critical factors*. Before determining conclusions regarding the nature of the future, it is first imperative to consider the primary lessons of the past.

ASD Philosophy and Principles

Overall, the implementation of ASD principles and philosophy in the RCAF pilot training system has produced many positive results, but it has not proven to be a panacea as was hoped.[169] The fundamental premise of ASD is that private companies leverage the full-spectrum of the free market to provide efficiencies unattainable by public agencies. This theory is based on the assumption that companies are more agile and innovative in their solution derivation than bureaucratic government organizations. However, it was clear that ASD was far from meeting the savings targets set in the 1994 White Paper.[170] The other main issue was the overall assessment and performance measurement of the progress of ASD which was not only difficult but was fatally flawed.[171] It is fundamental to note that the CRS audit of NFTC in 2012 determined that production between 2001

[169] LCol Michael Rostek, "A Framework For Fundamental Change?"…

[170] *Ibid*. ASD savings had amounted to a mere $60 Cdn million per year rather than the intended $300 Cdn million per year targeted by the year 2000.

[171] LCol Clifford Beattie, "The Hypothetical Most Efficient Organization: The Fatal Flaw in the Alternative Delivery Process,"…1.

and 2010 never exceeded more than 74% of target output.[172] Therefore, despite meeting 1994 White Paper objectives of reducing the number of uniformed personnel and outsourcing non-core activities, production deficiencies have proven that ASD is not a universal remedy for the challenges of RCAF pilot training.

Capital Asset Acquisition Paradigm

The most important future program factor is the capital asset acquisition paradigm. The acquisition methodology employed in the current contracts is private financing based upon guaranteed revenue streams. Crown fiscal austerity made it more expeditious and politically palatable to utilize operational and maintenance funding (O&M) instead of capital funds. In practical terms the RCAF leased the capital assets although this was not the method recommended by the Department of Finance as far back as 1997.[173] This approach, while it did facilitate acquisition of a new training fleet, resulted in two primary negative outcomes: increased cost and unintended consequences.

The most palpable impact of CFE capital assets was increased program cost. For example, the cost of a Grob aircraft was $1.4 Cdn million[174], however via the CFTS contract the RCAF will pay $3.4 Cdn million for each aircraft. In the case of the King Air which cost $3.3 Cdn million[175], the RCAF will pay $13.2 Cdn million. These values are calculated based on known purchase cost including profit, administration and a 10%

---

[172] Department of National Defence website, Chief of Review Services, "Audit of Force Reduction Program,"…

[173] Office of the Auditor General of Canada website, "1999 November Report of the Auditor General of Canada,"…

[174] $1.5 Cdn million less a $100,000 Cdn residual value assigned by the contractor.

[175] $5.3 Cdn million less a $2 Cdn million residual value assigned by the contractor.

private financing rate. Given that DND does not finance capital purchases but instead pays large milestone cash payments, the CFE via private financing costs are approximately three times higher that of the direct purchase.[176] Even if DND were to finance such a purchase, this would be done using Crown borrowing at the Consolidated Revenue Fund lending rate, which is updated and published regularly by the public debt section of the Department of Finance website.[177] While the net result of such a course of action would result in a reduced cost advantage, CFE financing would still be 200% more expensive.[178] Therefore, the DND direct purchase cost of the CFTS aircraft would have been $40.5 Cdn million vice a government financed purchase of $62 Cdn million versus the selected $126 Cdn million CFE option. Thus, the overall cost of the CFTS program would have been approximately $85.5 Cdn million lower had the aircraft been purchased vice financed privately which represents a program cost savings of 5%.[179] In the case of NFTC the cost of the program would have been approximately $580 Cdn million lower had the aircraft been purchased and then provided as GFE.[180] Such a cost would have reduced the unescalated cost of the NFTC program by approximately 20%. Such a savings would have significantly reduced the training cost per student.

---

[176] Cost of privately financed Grob and King Air fleet $126 Cdn million amortized over 20 years vice $40.5 Cdn million had DND purchased the aircraft directly.

[177] Department of Finance Canada website, "Consolidated Revenue Fund Monthly Lending Rates for Periods of One Year and Over." Available from; http://www.fin.gc.ca/admin/len/crf-tid-eng.asp?year=2005&month=06; Internet; accessed 8 November 2014.

[178] Cost of private financing $126 Cdn million amortized over 20 years vice a cost of $62 Cdn million if DND purchased at the mid-2007 Central Revenue Fund 20 year Lending rate of 4.43%.

[179] $85.5 Cdn million savings versus an original unescalated CFTS program cost of $1.77 Cdn billion.

[180] Cost of private financing of the original Series 1 NFTC fleet was $1.3 Cdn billion vice $720 Cdn million had the aircraft been purchased and made available as GFE.

There are other potential benefits of public financing. As discussed the reduction in cost per student would have made the program more attractive to potential customers. Some of the customers which left early may have elected to remain in the program.[181] It may also have been easier to sign additional customers which would have concomitantly increased NFTC program expansion, aided the contractor's revenue stream and provided further benefits to the RCAF in the form of augmented economies of scale.

Another benefit of public purchase of the capital assets is that difficulties associated with high guaranteed revenue would have been mitigated.[182] The contractor's desire for guaranteed revenue is understandable given the high cost of the capital acquisition paradigm. However, such guarantees are unconditional and irrevocable regardless of the performance of the contractor.[183] This creates a risk that in times when the RCAF is unable to fully utilize the available training, the contractor may elect to restrict services. Specifically, when faced with a revenue shortfall the most effective way to eliminate the deficit is to reduce costs as close as possible to the level of guaranteed revenue. This creates a downward spiral in which the RCAF reduces training to the level of available service which then forces the contractor to further reduce service delivery. This is exactly what led to the NFTC contractual cataclysm in 2011. During this period of friction with the contractor, the RCAF was still required to pay all guaranteed fees.

One of the main follies of the NFTC program was the integration of the training plan and the contract via the Integrated Training Plan that included all NFTC syllabi. Any

[181] The Royal Air Force left NFTC in 2008 vice a contracted 2010, Royal Danish Air Force left in 2010 vice 2020 and the Italian Air Force left the program in 2011 vice a planned departure in 2020.

[182] The high levels of guaranteed revenue are linked to lease principle and interest payments of program CFE capital assets.

[183] Office of the Auditor General of Canada website, "1999 November Report of the Auditor General of Canada,"…

change to the TP had to be carefully evaluated to consider aircraft fatigue and engine life as changes could negatively impact the longevity of the asset. This led to the TP being included in the NFTC agreement. This made any change to the syllabus an issue requiring analysis not only from an operational and maintenance perspective but also from a legal and contractual perspective. This made change arcane and in many cases hindered the evolution of the TP to address concerns regarding production. Even those changes which the RCAF considered to be inherently beneficial were met with scepticism by civilian partners.[184]

Another challenge is that because of civilian ownership of the training fleets, these aircraft do not fit into the RCAF WSM structure. This organization within the DND[185] provides dedicated engineering management support to all RCAF aircraft with the exception of the CFE fleets. Had the GFE option been selected the training fleets would have been assigned a dedicated WSM. The WSM would have facilitated upgrades and improvements which would have eased changes in support of the TPs as well as modifications to facilitate compliance with changes to ALSE during the life of the program.[186] In the case of the NFTC fleets each potential upgrade had to be analyzed as to the applicability of the contract. If the proposed upgrade was deemed out of scope of

[184] An example of this was the removal of introductory Basic Fighter Manoeuvres and Air to Surface Tactics from the Phase III Hawk TP in 2006. These changes reduced both aircraft fatigue and engine thermal cycles but had to be introduced as a trial until contractor acceptance could be achieved. This reality limited the flexibility of the TP from an RCAF perspective.

[185] The organization related to training aircraft is Director General Air Engineering and Program (Fighter/Trainers) which is a subcomponent of the Assistant Deputy Minister (Materiel) section of DND.

[186] One of the interesting dichotomies of NFTC is that DND is responsible for the provision of all ALSE (NFTC SOW, Book One Article 8.4 Aviation Life Support Equipment), however until the creation of the Technical Support Manager (TSM) NFTC in 2011 via a Service Level Agreement between the RCAF and ADM (Mat), there was no dedicated DND engineering support allocated to NFTC. ADM (Mat) created the NFTC TSM after recognizing that despite the civilian ownership of the NFTC CFE fleets these aircraft required DND oversight and support.

the pertinent contract then the RCAF was liable for the funding but there was no clearly defined mechanism to facilitate such changes to civilian owned fleets by means of government funding.[187] In addition, upgrades are affected by the ability of the contractor, as Technical Airworthiness Authority (TAA), to process changes.[188] Though the WSM organization is dedicated to the management of military fleets, CFE aircraft fall outside this organizational structure which also provides further procedural challenges to upgrades or modifications to the training fleets.[189] Therefore, it is clear that the CFE paradigm increased the cost of both CFTS and NFTC while also adding unintended consequences.

Resource Requirements

The availability of sufficient resources is one of the most important factors in the success of the next evolution of the pilot training paradigm. It is critical to properly assess resource requirements and to ensure that sufficient resources are available. The production inadequacies of NFTC were rooted in incorrect baseline assumptions related to the three main resource areas. As defined by the NFTC RAM these are: QFIs, aircraft and FTDs. The assumed ratio of QFIs to students in NFTC was incorrect. Experience has demonstrated that during *ab initio* training a ratio of one QFI to two students is required

[187] An example of this is the desire to upgrade the Harvard fleet with a Traffic Avoidance System (TAS). As this system is out of scope of the NFTC contract the RCAF is responsible for the funding. In addition, even if TAS was funded, the RCAF could also be liable for sorties lost on aircraft as they were taken offline to proceed through the upgrade process.

[188] This challenge manifests itself in the several forms. One of which is the requirement for adequate engineering capability to process proposed changes as TAA. There was a negative delta in this area for a number of years in NFTC until the contractor began outsourcing work to other contractors, and in-sourcing to parent company engineering.

[189] This issue became apparent when Hawker Beechcraft Corporation (HBC), OEM for the Harvard, filed voluntary petitions under Chapter 11 bankruptcy on 3 May 2012. During this period, engineering work on the Harvard was brought to a standstill. This issue only abated when HBC exited bankruptcy on 19 February 2013 as the rebranded Beechcraft Corporation.

given the same constraints and personnel time demands as NFTC. As QFI numbers were augmented during the first decade of the program, proficiency requirements were more than doubled which further decreased the resources available for student training and production.

Lastly, the initial model of the TP, in which FTD missions were sequential pre-requisites for flying missions, was far too inflexible to react to less than ideal or predicted weather. The assumptions regarding the ability to mitigate FTD availability by conducting training on bad weather days has been categorically disproved. An FTD mission is required when student training requires it and not when the FTD is available.[190] Any delay in FTD availability exposes the false assumptions regarding the efficacy of the five wave program and its role in minimizing the number of aircraft procured. All of these factors create a situation of peak and valley resource demand. Simply put, NFTC was resourced at the mean of demand with the assumption that scheduling and management would flatten the utilization sine wave; this has been disproven by actual operations. Pilot training is inherently time sensitive as a result of the requirement for useable weather which cannot be controlled or perfectly predicted.[191]

---

[190] For example if a student requires an FTD on Monday in order to conduct the related flight on Tuesday the FTD must be available and not in use for other students. If the FTD is not available Monday but is available Tuesday the student is automatically behind schedule. This is even more problematic during periods of adverse weather which may delay the conduct of the flying mission which leads to further regression in the training schedule of the student.

[191] The NFTC RAM and the new Undergraduate Pilot Training Resource Allocation Model use a weather model which has been significantly updated and which is much more scientific then the legacy FTDC. The RAM is quite accurate over a given time period however there are statistical variations of in-year weather. While resource demands affected by weather will even out over time, course duration is often not of sufficient length to account for all such variations. This is why adequate resourcing i.e. peak or near peak is required in order to allow the program to operate on a regular basis without the need for constant or near constant surge.

Performance Measurement

Another important area of consideration in the contracted flying training environment is performance measurement. All contracts are based upon a quantity of service delivered within a given amount of time. The normal methods by which the RCAF measures the success of its pilot training are not easily applied in the contracted environment. This was clearly indicated in a 2005 letter from Commander 1 Canadian Air Division[192] to the Assistant Chief of the Air Staff[193] concerning NFTC: "the current contract is unclear regarding program deliverables and the means by which success of the program is to be judged." In the legacy training environment the measure of success was the graduation of a given number of NWGs per year which ideally met the demand of the RCAF. Progress throughout the year was measured by quantifying the number of sorties completed versus the ideal to graduate the required number of NWGs and maintain the proficiency of the QFIs. When these targets were not met then the system entered into surge operations in order to attain the level required to meet the objective. Simply put, the RCAF controlled all the levers, personnel and resources, to meet its objectives.

However, in the contracted environment there are factors that are either not controlled by the RCAF or are less easily influenced. In the environment of outsourcing, the contractor provides the minimum resources required to deliver the contracted services. This is, on one hand, advantageous as it reduces RCAF cost to a minimum. However, when a program falls behind the required production the limitations of the

[192] 15 Wing units belonged to 1 Canadian Air Division until the creation of 2 Canadian Air Division, focused on training and doctrine, in 2009.

[193] Now termed Deputy Commander RCAF since 2011.

contract hinder the reacquisition of targets.[194] As well, the contract places limits upon the amount and method of surge operations that are available to the RCAF.[195] This is done as a method to control contractor costs in the firm fixed paradigm price so any deviation from these restrictions comes at increased cost.

In addition, the measurement of contractor performance with regard to delivery of service can be frustratingly problematic. As previously mentioned, the RCAF traditionally measures success by the number of trainees that graduate on time. However, if the number of bad weather days is higher than that predicted in the program model training delays cannot be counted against contractor performance. In addition, the measure of delivery of sorties is impacted by resource unserviceabilities and weather that are deemed beyond the control of the contractor. An example of this issue is continuing difficulty related to the availability of the Rolls Royce Adour engine that is used in the Hawk aircraft.[196] As the contractor derives their business plan and resources the program based on the assumptions of the program model, there is limited accountability when these assumptions, weather etc., are not met.

One of the results of the NFTC contractual difficulties in May 2011 was the creation of the bi-weekly KPI meeting between the RCAF and the contractor. Given the

---

[194] As an example, the NFTC contracted flying training day is 10.5 hours from Monday to Friday. There are further limits upon the number of aircraft and FTDs sorties available and the number of sorties that are available for use during weekends.

[195] Surge options are defined within the NFTC SOW under article 6.4 Rectification – Schedule Slippage. There are three options available including additional aircraft per wave within the normal working day, extending the operating day to generate more sorties (5^{th} wave Hawk or 6^{th} wave Harvard) and working weekends as required. These options must be discussed and agreed to by the contractor at the bi-weekly KPI meeting.

[196] Serviceability issues related to the Low Pressure Turbine Blades of the Adour engine began in 2006 and had a negative program impact after 2008 and continue even today. This issue required a two-year redesign by Rolls Royce, the engine OEM. This redesign, while offering improved reliability, has not yet successfully eliminated all of the availability issues.

problems with the contract, insufficient production from an RCAF perspective and negative revenue from a contractor position, it was mutually agreed that a new approach was required. As previously discussed, the RCAF re-engineered the pilot training paradigm to deliver the required training using reduced resources in order to take into account updated resource assumptions. From the contractor perspective the new paradigm was initiated on an at-risk basis aimed at the promise of increased training activity.[197] To support production and flying activity, a new manner of measuring performance was required. Thus, the KPI forum was created.[198]

The aim of the KPI meeting is to examine program progress and mutually agree to adjustments based upon performance. The agreement considered three primary indicators as measurement tools for the program which was: X count, staff proficiency and Yearly Flying Rate (YFR).[199] The group consists of operators, maintainers and contractual representatives from both the RCAF and the contractor. The group examines program progress in relation to the three measured factors in order to determine if surge operations are required. There is also a statistical examination of sorties not completed and the reasons why. The primary focus of the analysis is determining if the numbers of lost sorties are in accordance with the model and whether the contractor has provided

[197] The new NFTC syllabus along with the revised CFTS syllabus was initially accepted by both contractors and the CA on a trial basis which allowed better assessment of the financial impacts. Flying activity is critical to the revenue of the NFTC contractor.

[198] The enactment of the KPI forum was an attempt to redefine the performance management framework and empower local RCAF commanders and contractor directing staff to mutually maintain a reasonable operational tempo and increase student throughput. This direction was captured in the Implementation Plan following a meeting between the contractor and the RCAF on 22 November 2011.

[199] X count refers to the number of completed sorties versus the ideal number of completed sorties necessary for the students to graduate their courses on-time. A positive X count means the program is ahead of schedule and conversely a negative X count means the program is behind schedule. Staff proficiency refers to the number of staff proficiency hours completed which his compared to the end year requirement and YFR refers to the number of hours flown versus the monthly plan to achieve the yearly YFR goals. As discussed the contractor financials are closely tied to the YFR.

sufficient sorties and that the RCAF has honoured its obligations to provide sufficient QFIs. Although surge operations are in the contract, there is often close scrutiny on the necessity of surge as there is a cost to the contractor and there is a preference for certain options over others because of cost implications. Moreover, as a result of various union agreements affecting the civilian labour force, sufficient notice of any surge operations must be given in order to honour such commitments. In addition, the civilian workforce conducts any overtime on a voluntary basis and cannot be compelled to do so. Therefore, the contractor requires sufficient time to ascertain if it can support the surge request for additional waves or weekend operations.

Overall, the implementation of the KPI has been positive for NFTC and supports the new training paradigm. Student throughput has increased and so has the ability to fly the YFR. However, there are limitations to the effectiveness of the KPI as there is still a strong contractual influence in the group's conduct and there is insufficient flexibility to capitalize on operational opportunities like an unforecast period of better than predicted weather. The current KPI structure is too contractually focused and operational players are not sufficiently empowered to affect the program.[200]

As discussed earlier, the CFTS contract attempted to increase contractor incentive to perform by the inclusion of PIF. The administration of PIF is very labour intensive for both the RCAF and the contractor. As well, the RCAF desired to provide the contractor

[200] BGen M.P. Galvin, Visit *Report - Royal Singapore Air* Force [sic] (RSAF) *and Royal Australian Air Force (RAAF) Pilot Screening and Trg Systems.* (17 Wing Winnipeg: file number 1776-1 (AF AOT), 3 January 2013).The positive contribution of operationally focused KPIs was specifically noted during the 2012 visit of the RCAF to the RAAF and RSAF training systems in Australia. In the observed system there is a high degree of devolution of authority and responsibility to the tactical level. Overall, while the KPI concept was introduced to NFTC as a component of the training system paradigm update in late 2011 and early 2012, the observed KPI structure operates with a much higher degree of operational focus than that employed in NFTC.

with the opportunity to achieve innovation. However, this methodology does not recognize the cost and risk to the contractor associated with innovation. There was an attempt to mitigate this issue by providing broad target areas for the contractor to work toward but this was found to lead to an environment of conflict during the evaluation process which lessened the positive impact of the incentive. This predicament was ameliorated by providing more specific goals and detailed performance criteria for the contractor within a given timeframe.

Performance measurement was a problematic issue in both CFTS and NFTC. The method of measuring program success was not clearly defined. As well, neither program, more so NFTC, was appropriately modelled and resourced to be capable of absorbing annual variances in weather and fleet availability. Surge mechanisms appeared to be well defined but the associated triggers were unclear in contractual language which limited operational flexibility. Lastly, while PIF can be said to be largely successful, it imposed a steep administrative burden upon both the RCAF and the contractor. Addressing these problematic areas of performance measurement will facilitate future success.

Relationship

Based on the experiences of the RCAF and the contractor it is apparent that a functional relationship is paramount to ensure the success of both parties in the ASD environment. It is also evident that often the revenue drivers of the contractor are not always apparent to the end-user. Additionally, the risk avoidance focus of government contacting policies and procedures ignores the transfer of risk that long-term firm fixed contracts impose upon a contractor in a milieu as fluid as pilot training. Thus, there are

several lessons to be considered in the area of contractor relationships which can benefit the RCAF and its objectives in the next pilot training paradigm.

First and foremost is the reality of profit and revenue. Private industry enters a business arrangement to garner profit. Profit itself is a result of revenue exceeding cost. While government policies recognize this need, the protection of taxpayer dollars in the public environment is preeminent. As such, policies and regulations are tailored to providing profit in consideration of associated risk and minimizing financial outlays. While minimizing risk and outlay is intrinsically good in the public sense this must also fulfill the need of private industry in order to ensure mutually beneficial relationships.

It seems evident that government profit categorization does not recognize the transfer of risk to contractors in long-term firm fixed contracts in such a dynamic environment. While the contractor attempts to build buffers into its pricing, thus increasing cost, there is a large risk that its estimates will not cover changing costs a decade or more into the contract. When the contractor is revenue negative not only is profit absent but the enterprise in fact costs the contractor money, as exemplified by the NFTC contract. This creates a situation where cost control becomes a primary focus of industry and it is much less likely that the goals of the customer will be met. This is especially valid in the case of pilot training in which revenue is inherently dependent upon the utilization of contracted capacity. As it is the RCAF that controls student loads and YFR utilization, the importance of this to the contractor must be fully appreciated. It must also be recognized that the flexibility in training coveted by the RCAF is only secured at a financial cost. Moreover, there is a price attached to the concept of a prime contractor. This adds a layer of profit in each of CFTS and NFTC that increases the cost

of student training. This impacts program flexibility and the ability to market training thus reducing potential economies of scale.

Secondly, government contracting policy and zero risk tolerance are not well suited for the pilot training paradigm. Contracting policies are cumbersome and the resultant lead time to effect change is incongruous with RCAF pilot training requirements. It is also apparent that the cognitive recognition of the impact of risk transfer to the contractors was not fully understood. Moreover, the environment is contractually very difficult and more costly to the contractor. The multi-headed customer of RCAF pilot training provides the contractor stiff challenges satisfying all concerned parties who often seem to have conflicting risk acceptance profiles. Instances in which revenue and risk are not aligned result in poor relationships which imperil the aims of all concerned.

Lastly, it is evident that neither the RCAF nor its contractors fully appreciated the degree of change inherent in the programs. Such activity was considered in the respective SOW but the volume of amendments has grossly exceeded both business cases. Undoubtedly, a constituent of this activity in the case of NFTC is a result of the previously discussed programmatic problems like false initial resourcing assumptions. However, the TP has been wholly reconstituted on two occasions thus far and there have been multiple smaller scale modifications. The reality of pilot training, as has been demonstrated by experience, is continuous TP improvement and evolution. Adequate consideration of this fact in the future will ensure a proper business and less resistance to change by all stakeholders.

It is critical that the RCAF ensures a mutually beneficial relationship with its contractor or contractors in the future. In addition, government contracting policies are not ideally suited to the pilot training environment. Finally, the volume and pace of TP change was far beyond forecast in either program. It is apparent that in the dynamic area of large pilot training contracts a high degree of change is a fundamental reality.

Marketing

Marketing was important in the creation of both programs. However, attracting and retaining customers has proven problematic. Although NFTC was fundamentally constructed to facilitate marketing, CFTS was not which limited success. Moreover, program costs did not compare well to other alternatives.

In the case of CFTS, it is clear that there was intent to sell training but there was no authority to expand the program as there was in NFTC.[201] The strategy seemed to be that once a customer was found then the authority to expand would be secured. However, this approach did not consider the impacts of the cumbersome and arduous approval process. As well, the synergy of CFTS and NFTC was not appreciated within the RCAF.[202] It was assumed that other nations were only interested in the purchase of fighter training. However, this was not always the case. The RSAAF purchased Phase I training in addition to, and in fact as a prerequisite for, their NFTC training. There were also several other nations that expressed interest in helicopter or multi-engine training at

[201] At times in the NFTC program the RCAF delayed its own training to ensure that Allied training, which was tied to hard follow-on course start dates, was completed. This was especially evident during times of limited training resources.

[202] Prior to the training purchased by the RSAAF other customer nations had only purchased NFTC slots i.e. those related to fighter training. These allied students arrived at NFTC having already completed Phase I training and sometimes Phase II training as well. In the case of the RSAAF, there was a desire to fully embrace RCAF training such that Phase I training at CFTS was purchased as well.

CFTS but such sales were hindered by the lack of authority to expand capacity.[203] Unlike CFTS, NFTS contained built in expansion gates that increase the three key resources as student numbers increase. The difficulty was that a particular aircraft model only has a limited production run period. For example, 21 Mk 115 Hawks[204] were built and then production moved on to an altered version. So after the first few years of a program it was unlikely that similar aircraft were available for purchase.[205]

Conclusion

Examining the background of ASD in Canada, its effects upon the current contracts and the contractor perspective provides many lessons learned. In fact, there are lessons learned in each of the *critical factors*. Proper consideration of these issues will lay the groundwork for future success.

The CFE capital asset acquisition methodology employed by the two contracts permitted the recapitalization of the training fleets. However, it also resulted in two significant negative outcomes: increased costs and unintended consequences related to the lease based paradigm. The much greater cost when compared to a GFE solution limited program flexibility in a tight fiscal environment and greatly hindered marketing efforts. Incorrect resourcing assumptions and high guaranteed contractor revenue streams created production issues which could not be overcome without drastic programmatic changes. The cooperation achieved in NFTC to facilitate change emphasized the value of

[203] The Royal Saudi Navy, the Royal Brunei Air Force, the Brazilian Navy as well as the German Navy have expressed interest in CFTS training slots.

[204] The Hawk Mk 115 is the version of the Hawk family of aircraft employed in the NFTC program.

[205] Therefore, mixed fleet operations (old and new models) would have to be considered or additional aircraft purchased at program commencement as a hedge for future sales which would increase overall cost.

a strong RCAF/contractor relationship. This relationship was constantly under siege by archaic government contracting policies ill-suited for the dynamic pilot training environment. Proper consideration of these lessons learned leads to several recommendations for the future pilot training paradigm.

CHAPTER 5 - RECOMMENDATIONS

The results of the future pilot training program investigation will shape the RCAF for decades to come. As the operational fleets modernize and become increasingly flexible so must the pilot training system. The ASD paradigm has provided benefits but has inherent pitfalls that must be avoided. As in any operational planning process all stakeholders must be considered. Business is, by definition, driven by revenue and profit. Crown contracting procedures are tailored to minimize risk. The RCAF requires a program that achieves quality and production in sufficient numbers at an affordable price. Given this setting, hard won lessons learned must be carefully considered.

One possibility would be to commence the future pilot training program in 2021. However, it is accepted within the RCAF that timelines for approval of such a program commencing in 2021 are already challenging and the training paradigm of the program will be directly affected by the delayed selection of the next generation fighter platform. Thus, selection of this path is unlikely. In truth, one of the strategic objectives of the future pilot training examination should be to harmonize the pilot training system under one program. This path would make program and contract management far simpler as there would only be one contract, one set of terms and conditions and one corporate account. Therefore, the fact that the two contracts are not synchronized[206] requires an *interim training solution* from 2021 to 2027 during which CFTS would continue as currently embodied. The *long-term comprehensive solution* should commence in 2027 as an all-encompassing, harmonized pilot training system.[207]

---

[206] As a reminder, NFTC expires in 2021 and CFTS expires in 2027.

[207] The long-term comprehensive solution should include all phases of pilot training.

In examining COAs, specific consideration must be given to the capital assets acquisition paradigm. The CFE paradigm does not fit well within the normal structure of RCAF aircraft management. If the CFE paradigm is to be maintained then a structure must be implemented such that the RCAF aircraft management is considered so that oversight for these fleets can be conducted in as normalized a fashion as possible. In addition, a CFE paradigm will likely carry similar obligations as per NFTC, like responsibility for ALSE equipment and if the normalized structure is not in place then effecting change and standards in this area of responsibility will be as difficult as it was during NFTC. As well, essential matters such as aircraft fatigue, as it is so critical to program success, longevity and cost control, must be overseen and monitored by the RCAF. This was a problematic issue with the Hawk fleet. Remediation was an RCAF responsibility as it was out of scope of the contract based on the premise that it was RCAF training that placed this factor in jeopardy of not allowing the sustainment of the Hawk fleet for the life of the NFTC contract.

Moreover, a GFE paradigm would facilitate a much improved and adaptable contracting model. One of the main reasons for such long-term contracts is the requirement to finance expensive capital assets over a long period. However, in a GFE paradigm this would not be required. Therefore, one of the main contractor identified issues could be addressed in that checkpoints during the contract, providing performance assessment and adjustment opportunities, could be included. As an example, a long-term contract could include five year checkpoints such that contractor performance could be assessed and profit margins etc. could be revisited. Moreover, if TP changes have created

revised cost profiles or resources need adjustment then these issues could be addressed. This would provide benefit in many of the *critical factors*.

There would be many benefits to the Crown acting as its own prime contractor. This would immediately reduce program costs as there would be no intermediary profit layer between the Crown and the sub-contractors. All of the current sub-contracted services could be maintained[208] including aircraft maintenance with the current prime contractor.[209] In essence the only change from the current paradigm is reduced cost and a direct relationship with the contractors of all support services. If this path is selected it would be necessary to create an onsite contract management cell. Oversight, management and relationship considerations would necessitate a strong onsite presence with devolved responsibility to handle all in-scope contract issues. Although there would be a personnel demand this would pay dividends beyond the monetary and personnel inputs that would be required and would address many of the issues noted by the contractor.

In addition to the assumption of some form of ASD and the capital asset acquisition paradigm there are elements of the other variables that must be applied to whichever COA is selected. Firstly, the future program must be properly resourced. NFTC was hindered from the outset by incorrect resource modeling related to key program resources. This must be avoided in the future. The revised RAM includes both NFTC and CFTS which recognizes the synchronicity of the pilot training continuum and employs the most up to date assumptions of weather, etc. Moreover, the TPs initially employed by both current programs were not structured to fully leverage technology and

[208] The number of sub-contracted services could also potentially be reduced if DND or RCAF services could be employed, for example weather related services could potentially be provided by the Joint Meteorological Office.

[209] It is likely that contracted support services would be put out for competition.

were inflexible. The revised TP concepts currently employed should be used as a basis for the design of future training. In short, it has been repeatedly proven that best business practices of minimizing required resources do not fit well with the dynamic and fluid pilot training environment. One method to counter this issue is the employment of the VIQ model. This allows yearly adjustments to training inputs, and thus outputs, while not impugning the contractor's revenue stream or profits. This approach adds to the flexibility of the program which is imperative from the RCAF perspective. In short, the future program should not be resourced to the mean of requirement, which must be properly modeled, but to a near-peak in which peak demand can be realistically accounted for with active resource management[210] and VIQ.

Secondly, performance measurement must be approached from a modified perspective. The method of measuring program success must be clearly defined. The primary measurement tool should be performance within the KPI construct. Most importantly the KPI must remain a measurement of program progress rather than being a tool to measure contractual compliance, while this is a contractual element to KPI the primary focus must be operational. As currently structured the KPI is too contractually focused. This ignores the premise of resolution at the lowest possible level and the mutual benefits of operationally focused program measurement. An example of programmatic cognitive dissonance is the requirement that the program must be behind in order for surge to be approved. There is very little ability to surge in the summer because of QFI postings and summer leave and the FTDC averages four flying training days per

[210] This should be feasible given the recent production of the new Undergraduate Pilot Training Resource Allocation Model which embodies all of the lessons of NFTC with the parallel unique aspects of CFTS.

week leaving very little room for surge. In addition, there is little scope to surge during the winter as a result of adverse weather. Therefore, surge should be planned in the early fall when weather conditions are generally still adequate and available manning returns to normal after the summer. As well, surge should be planned in early spring to account for any deficiencies during the winter. In so doing maintenance schedules can be tailored to facilitate maximum aircraft availability during these periods thus maximizing the effect of the surge.[211] This is impossible in the current paradigm as the program must be in a negative position.

An operational focused KPI will lead to contractual compliance rather than the other way around. Operational players at KPI should be empowered to render decisions, related to surge requirements etc., within the bounds of the contract[212] and KPI meetings must not be led by contractual players. KPI decisions should be made in mind of what the program needs within the bounds of the contract limits.[213] Surge mechanisms must be clearly defined, allow mutually agreed modification and associated triggers must also be included in contractual language while maintaining operational flexibility. As long as these criteria are met then there should be no pushback from the contractual side.

---

[211] In reality X counts mean different things at different times of the year. For example, by end October 2 CFFTS should aim to be a minimum of the equivalent of five flying training days ahead in order to account for statistical variances in the weather model during the upcoming winter. It would be possible to be in a positive X count position, thus not triggering surge in the current paradigm, but not be five days ahead. In this case, the program is actually behind.

[212] This requires that KPI representatives are appropriately educated with respect to contractual limitations such as: the number of additional aircraft per wave available, requirements for additional waves per day, the number of aircraft available per weekend, number of days of available weekend flying, availability of required numbers of civilian employees, notification requirements of labour agreements etc.

[213] If action is needed beyond the limits of KPI empowerment, contractual consultation and possible negotiation would be required.

Thirdly, the RCAF and the Crown must recognize the importance of a mutually beneficial relationship with the contractor. Profit and revenue must be adequately provided for in order to guarantee the achievement of pilot production goals. In addition, government contracting policies are not ideally suited to the pilot training environment. All public stakeholders must make certain that, within the fulfillment of regulations, process is not allowed to trump effective contractual execution. Crown contracting policies do not fully recognize the transfer of risk to the contractor in a long-term firm fixed environment. This transfer should be considered holistically to provide adequate revenue flow to the contractor in order to ensure a solvent service provider that is incentivized to provide the service required by the RCAF. The concept of five year checkpoints is one method to address this issue.

Another tool in this process is PIF which provides a strong incentive to the contractor to be amenable to the periodic if not near constant change that occurs in the dynamic pilot training environment. This is also a prudent path to account for the vagaries of statistical resource models which are accurate in the long-term but will no doubt cause challenging in-year variations and negotiation. However, if PIF is to be utilized then dedicated personnel resources must be allocated and performance criteria have to be as specific as possible.

Fourthly, as highlighted by the contractors, one of the most critical relationship issues is that revenue not be linked to an element that requires flexibility i.e., if the number of students loaded is lower than planned in the contract this should not reduce revenue. The RCAF must ensure a strong relationship to maintain flexibility and ensure production.

Lastly, if marketing is a desired objective in the future pilot training paradigm then it must be approached systematically. Marketing of training capacity can be a very beneficial component of the future training construct. However, the first step is that strategic direction must be very clear. At the strategic level, closer ties between allied countries, non-allied countries and between air forces can be achieved. For example, Canada currently espouses a global engagement strategy which encourages closer ties with South America countries.[214] As well, there is a desire to solidify relationships with allied Middle Eastern nations.[215] It is fortuitous that several Middle Eastern nations have already participated in NFTC or have shown an interest in RCAF training.[216] In addition, an expanded program will achieve greater economies of scale and reduce unit training costs for all participants. At the tactical level, an expanded program is more robust as there are more resources available to be managed which increases program flexibility.[217] Most importantly the program must have the authority to market both excess capacity, which should be very clearly defined, and the ability to expand.

Additionally, any future program must have built in expansion gates that increase the three key resources as student numbers increase. However, after the first few years

---

[214] Canada, Foreign Affairs, Trade and Development Canada, "Canada's Strategy for Engagement in the Americas" (25 July 14). Available from http://www.international.gc.ca/americas-ameriques/stategy-strategie.aspx?lang=eng; Internet; accessed 17 December 2014.

[215] Canada, Foreign Affairs, Trade and Development Canada, "Baird Strengthens Canadian Relations with U.A.E." (13 November 2014). Available from http://www.international.gc.ca/media/aff/news-communiques/2014/11/13d.aspx?lang=eng; Internet; accessed 17 December 2014.

[216] The RSAAF participated in both NFTC and CFTS while the United Arab Emirates Air Force participated in NFTC. Other air forces like the Royal Bahraini Air Force and Royal Air Force of Oman have expressed interest in RCAF pilot training.

[217] An example is that increased resources are available to facilitate surge operations as a result of a period of adverse weather.

the same aircraft may not be available. This reality leads into the early engagement of potential customers to maximize the size of the program at launch in so far as possible. The RCAF has previously taken the approach of defining national requirement, building a system to accommodate this requirement and then attempting to market the program after it is defined. It is possible that allied nations would be more inclined to participate in a program in which they were an initial stakeholder. Therefore, potential customers should be engaged during the definition phase in order to help define an overall program that fulfills RCAF requirement and facilitates increased economies of scale and reduced unit costs.

COAs

Therefore, the fact that the two contracts are not synchronized requires an *interim training solution* from 2021 to 2027 during which CFTS would continue as currently embodied. The *long-term comprehensive solution* should commence in 2027 as an all-encompassing, harmonized pilot training system.[218]

Interim Training Solution

All COAs are all based upon the following assumptions: some form of ASD must be continued in order to minimize military personnel requirements,[219] PMB and TB approval must be obtained for *all potential COAs involving training currently provided*

[218] A pre-2027 lead-in period may be required depending upon the transition plan from the *interim training solution* to the *long-term comprehensive solution*.

[219] While a reduction in the number of uniformed military personnel required is desirable the number of uniformed personnel required should be no higher than the number currently employed in NFTC and CFTS. Alternatively, any required increase should be minimized.

by NFTC beyond 2021[220], a national pilot training capability shall be maintained[221], NFTC infrastructure including improvements reverts to the Crown upon contract expiry, there are no sales of training capacity[222] and a new pilot training continuum is required post 2027.

In addition, it is assumed that the Harvard and Hawk fleets will be employed. Studies conducted by the RCAF indicate that such usage is possible given proper management of key issues. The Harvard fleet has sufficient fatigue life to allow use at current NFTC contracted rates until 2030. [223] The primary challenge with the Estimated Life Expectancy of the Harvard fleet has to do with minor avionics obsolescence issues and adjustment to the maintenance management paradigm to facilitate extended usage.[224] Therefore, the Harvard fleet can be used until 2030 and the Hawk fleet could be employed until 2027[225] given precise oversight.[226] The major factor to consider is Fatigue

[220] There are currently no monies allocated (PMB) or spending authorized (TB) to execute the portion of training conducted in NFTC in 2021-2027.

[221] This would not preclude some level of training taking place outside Canada in another training system, for example ENJJPT, however, a domestic capability is assumed as a national strategic objective.

[222] Sales could be considered but only those in excess of RCAF requirements due to a lack of expansion capability during this period.

[223] Major H. Pellerin, "CT-156 Harvard II Estimates Life Expectancy,"…

[224] The Harvard fleet is currently being managed to ensure operations to the end of the NFTC contract but not beyond. The maintenance management paradigm should be modified as soon as possible in order to ensure the possibility of continued usage, for example stockpiling of spare parts, scheduling of inspections, Airworthiness Certification activities etc. In addition, in order to mitigate avionics obsolescence issues an avionics upgrade should be investigated.

[225] LCol G. Thibault, "Hawk ROM Capacity Assessment to 2027 based on extrapolation of 135 FI,"…

[226] Given that the fleet would now be owned by the RCAF a WSM should be employed to oversee all maintenance activities.

Life.[227] There are also avionics obsolescence issues that must be investigated and addressed.[228] In addition, the maintenance management paradigm should be adjusted as soon as possible in much the same way as discussed regarding the Harvard fleet. Student loading would be another key area of strict requirement definition and control. It is unlikely that all of the RCAF's Phase IV requirement could be accommodated using the Hawk fleet.[229] However, the majority of the training could be satisfied by the Hawk fleet. The requirement delta could be mitigated by increasing the RCAF's usage of ENJJPT.[230] Overall, use of the Harvard and Hawk fleet during the *interim training solution* is possible as long as the fleets are properly managed. In addition, some level of funding will be required in order to address sparing, avionics obsolescence issues and to secure additional ENJJPT slots. While mitigating such issues would require a cost analysis, the expense would be a fraction to the cost of fleet replacement.

Interim Training Solution COAs

[227] A Hawk Fatigue Life Extension project is currently underway which will extend the fatigue life of the aircraft to 135 Fatigue Index units (FI). While the aircraft were designed to use 100 FI during the NFTC contract, FI usage was much higher than predicted in the first half of the program. The Extension project was initiated to ensure Hawk viability until 2021, however, there is evidence that there will be FI remaining, given current usage rates, at the end of NFTC.

[228] As is the case with the Harvard fleet an avionics upgrade would mitigate this issue.

[229] LCol G. Thibault, "Hawk ROM Capacity Assessment to 2027 based on extrapolation of 135 FI,"…Depending upon the post-2021 RCAF Phase IV requirement 65.9% - 87.5% (twenty-two or twenty per year respectively) could be accommodated employing the Hawk fleet.

[230] LCol G. Thibault, "Hawk ROM Capacity Assessment to 2027 based on extrapolation of 135 FI,"…The RCAF currently utilizes two ENJJPT slots per year. If this was increased by six or one slot per year, based on an RCAF requirement of twenty-two or twenty per year respectively, then the Phase IV training delta would be mitigated.

Firstly, the current paradigm could be maintained until 2027. [231] The present NFTC prime contractor could remain[232] and Milit-Air could retain ownership of the capital assets. The benefit of COA 1 is that it presents the least degree of change as all required personnel and infrastructure are already in place. In addition, the post-2021 program would represent a cost savings as the NFTC lease fees would not be required although the contractor could be expected to ensure positive revenue streams.[233] The drawback with this approach is that all of the aforementioned negatives of NFTC would also be maintained such as unintended consequences of non-GFE capital asset ownership, problematic resourcing assumptions, divergent aims and risk profiles of the Crown and the contractor.

Secondly, the Crown could purchase the capital assets from Milit-Air for the residual value and maintain the current contractual paradigm until 2027. The primary advantage of COA 2 is that the problems associated with CFE capital assets are eliminated and the aircraft could be more easily assimilated into the normal RCAF OAA and TAA structure. The primary disadvantage of this approach is that the residual value of the assets is not defined within the agreement with Milit-Air. This process could be complicated and potentially litigious and timelines for the finalization of terms are uncertain. In addition, in maintaining the current contractual relationship the degree of

[231] The phrase "current paradigm" in this case refers to the continuation of ASD services with a civilian company as prime contractor coordinating a group of sub-contractors. The current Crown contract management structure would continue.

[232] This would require a case for sole-sourcing to be approved by TB otherwise a competition will be required.

[233] As previously noted the contractor is in a negative revenue position with respect to the Harvard fleet.

change is moderated, which aids timely implementation, although previously noted negatives are maintained.

Thirdly, Milit-Air could donate the capital assets to the Crown and the current contractual paradigm maintained until 2027. The advantage COA 3, which assumes the cooperation of Milit-Air, is that ownership of the capital assets[234] reverts to the Crown at zero cost. As well, the disadvantages of CFE assets are avoided. By maintaining the current contractual relationship change is minimized but the negatives of ASD are continued.

Lastly, COA 4, Milit-Air would donate the capital assets[235] and the Crown could become its own prime contractor until 2027. The lack of contract synchronization provides a unique opportunity for the Crown to trial this new paradigm.[236] Crown ownership of the capital assets would eliminate all of the negatives of CFE capital assets. Moreover, this would be the least costly option. The capital asset lease fees would already paid and, as the Crown would be dealing directly with the subcontractors, profit mark-up would be minimized.[237] It is also important to note that this COA would be funded from capital funding rather than O&M which can be more difficult to secure in a challenging fiscal environment.

---

[234] This includes all tooling, spare and associated miscellaneous supporting capital assets.

[235] Such a donation is subject to negotiation with Milit-Air under the provisions of the current agreement between the Crown and Milit-Air.

[236] The COA 4 hybrid solution would be a new paradigm, as compared to the current ASD paradigm. This approach which would facilitate a validation of the business case advantages of GFE capital assets and the Crown acting as its own prime contractor.

[237] In the case of COA 4, the Crown and the subcontractors are involved in a direct relationship which would eliminate a layer of management and profit requirement.

Based upon lessons learned and assessment of the available options the recommended *interim training solution* is COA 4.

Long-Term Comprehensive Solution

Following the interim training solution, post 2027, a *long-term comprehensive solution* is required. In consideration of this requirement there are two available COAs. These COAs are based upon the following assumptions: some form of ASD must be continued in order to minimize military personnel requirements, PMB and TB approval must be obtained, a national pilot training capability shall be maintained, NFTC infrastructure including improvements reverts to the Crown upon contract expiry and training capacity will be marketed to defray Crown costs.

Long-Term Comprehensive Solution COAs

The first COA is a continuation of the current paradigm of a business prime contractor providing CFE capital assets as per the NFTC and CFTS contracts. The advantage of this approach is that the program could be funded from O&M vice capital funding. However, this would be a profound step backwards given the lessons learned of the current programs. Essentially, the RCAF and the Crown would knowingly pay a higher cost than a GFE solution in order to ensure an assumed to be easier financial pathway.

The second COA would be a continuation of the recommended approach for the *interim training solution*. In this COA the Crown would act as its own prime contractor and provide capital assets via a GFE solution. This would be the least expensive option which would reduce costs and make the program more attractive to potential participants. Moreover, all of the pitfalls of CFE solutions would be eliminated and the full spectrum

of lessons learned could be applied. The downside of this approach would be the necessity to obtain capital funding for the project. However, a solid business case could be constructed emphasizing the merits of the savings in a GFE paradigm.

Based upon lessons learned and assessment of the available options the recommended *long-term comprehensive solution* is COA 2.

Conclusion

The recommendation for the *interim training solution* is that the capital assets be donated to the RCAF and that the Crown acts as its own prime contractor. For the *long-term comprehensive solution* the recommendation is that the capital assets be provided as GFE and the Crown acts as its own prime contractor.

CHAPTER 6 - CONCLUSION

The RCAF stands at a crossroads in its pilot training program. Fiscal and political factors resulted in the 1994 White Paper on Defence. This document outlined government plans to decrease financial and personnel resources allocated to national defence. In order to achieve its cost reduction aims the government focused on minimizing military personnel requirements and reducing costs via outsourcing. The creation of NFTC and CFTS solidified the evolution from the traditional military manned system to an ASD paradigm. But, ASD has not proven to be the panacea that it was believed to be in the 1990s.[238] Moreover, the financial benefits realized have been a fraction of what was initially envisioned.[239] However, this is not to say that gains have not been realized. In a time of extreme financial restriction training fleets were recapitalized and a high quality training system was created. But aside from unachieved financial objectives there are several other negatives that have evolved from the ASD paradigm that was employed, for example, the unintended consequences and increased cost associated with CFE capital assets. The purpose of this paper was to examine the effects of ASD upon RCAF pilot training and to determine a path that emphasizes ASDs strengths while eliminating its weaknesses.

In order to emphasize the positive aspects of outsourcing while side-stepping the negatives, the RCAF must learn from its experience. There are several *critical factors* that must be considered and addressed if the future program is to be successful, as some form of outsourcing will be employed. These factors include: implementation of ASD

[238] Lieutenant-Colonel Clifford Beattie, "The Hypothetical Most Efficient Organization…1.

[239] National Defence and the Canadian Forces website, "1994 White Paper on Defence,"…

principles and philosophy, the capital asset acquisition paradigm, resource requirements, performance measurement, the RCAF/contractor relationship and marketing. In fact, the success of the future pilot training program is dependent upon effectively addressing these *critical factors*.

Lessons learned from an examination of these *critical factors* must be applied during the development of the next generation of RCAF pilot training paradigm. The ASD paradigm has reduced the number of military personnel required to conduct pilot training. This frees highly trained personnel to engage in operational duties. Costs savings garnered by outsourcing in this context are difficult to measure. While the Crown's savings targets for ASD were not met, a fully developed cost comparison to a traditional military solution has never been completed. This would be a valuable topic of future research.

The capital asset acquisition paradigm is one of the most important factors to consider in the development of the future program. The current system employs a CFE model that was necessitated by fiscal climate and expedient O&M funding. However, even a rather cursory analysis clearly demonstrates that this method is far more expensive than a GFE solution. This reality must be carefully considered in future planning as reduced costs make the program more palatable to government and more marketable to potential customers. A GFE solution would also eliminate the complications derived by the high levels of guaranteed revenue required by CFE fleets. This was a large contributor to the difficulties experienced in NFTC by both the RCAF and the contractor. It must be remembered that a CFE solution was recommended by the Department of

Finance back in 1997.[240] However, obtaining capital funding can be more difficult and therefore, a detailed business case comparing a CFE and a GFE capital asset paradigm should be a high priority future research topic for the RCAF. If a CFE is selected then careful consideration must be given to the inclusion of CFE fleets into the RCAF aircraft management structure to mitigate the unintended consequences of leased aircraft.

Whichever solution is selected for the future, resource allocation will determine the efficacy of program production. There are three key assets that must be modelled and resourced properly. These assets are; aircraft, FTDs and QFIs. During NFTC there were multiple incorrect assumptions in program resourcing that handicapped the program from the outset.[241] Overall CFTS and NFTC were resourced to the mean of demand. This left both programs unable to easily react to surge requirements demanded by unforecast weather or other production hindrances. Another area of future research should be resourcing methodology to ensure proper modelling assumptions at near peak resourcing. This should lead to a business case which compares the increased cost of near peak resourcing against the cost of program inefficiencies of production losses and surge operations.[242]

Performance measurement is an essential element requiring improvement in the future. Accurate and fair measurement ensures value for dollar on the part of the Crown and contributes to contractor performance and profitability. However, the vagaries of flying training make performance measurement a very difficult exercise. NFTC

---

[240] Office of the Auditor General of Canada website, "1999 November Report of the Auditor General of Canada," …

[241] Some of these assumption areas are as follows: the flying training day calendar (FTDC), aircraft capabilities, Training Plan (TP) effects upon FTD utilization and availability, QFI manning, proficiency hours, sortie generation paradigm (wave pattern) and contractual sole sourcing.

[242] When compared to resourcing to the mean in the case of CFTS and NFTC.

implemented a KPI model to improve RCAF/contractor communication. However, as currently constructed the KPI meetings are much too contract focused. In the future the KPI should be operationally focused. Stakeholders must be empowered to make decisions and act within the bounds of the contract. This will benefit both RCAF production and contractor revenues.

Another mechanism to aid performance is to increase contractor incentive. The CFTS contract implemented a PIF. This fee offers a financial inducement for contractor innovation and exceeding service parameters. It also affords the RCAF the opportunity to increase contractor effort in desired areas of focus. As such, a topic of future research should be to quantify the impact of PIF in Crown contracts and consideration should be given to including PIF in any future program.

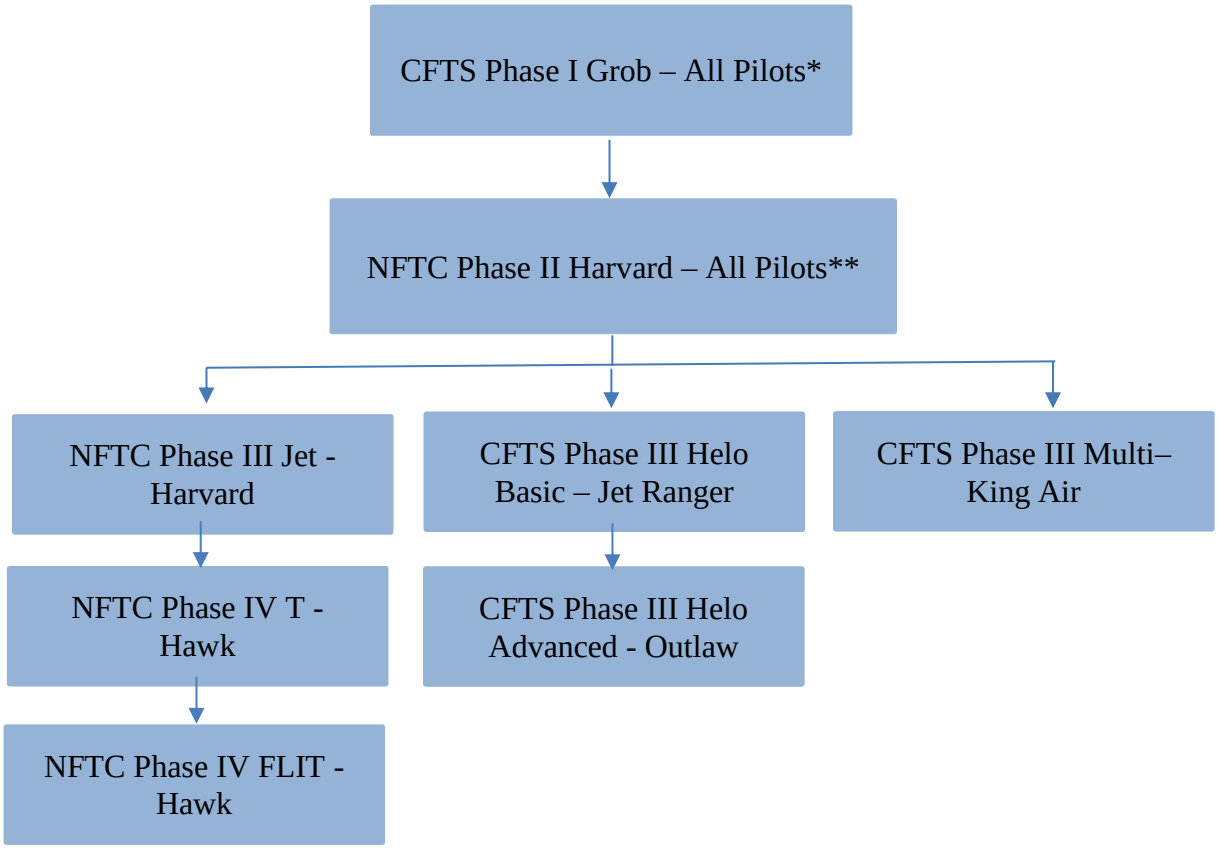
The relationship between the RCAF and contractors should also be a future focus. It is clear that there are many checks and balances necessary within the government contracting process in order to ensure the public interest in dispensing federal funds. However, the net result is that the Crown, as represented by the CA, has very little tolerance for risk. Moreover, the CA and its procedures do not recognize the high level of risk which long-term firm fixed contracts impose upon the contractor. From the contractor perspective government procedures and limitations were often frustrating and hindered program growth and productivity. A sound relationship guaranteeing a reasonable profit is essential to the future program. Future research should focus on the correlation between revenue and contractor relationships in Crown contracts.

Marketing must be approached systematically in order to be successful. NFTC was created with training capacity sales in mind and contained built-in expansion triggers

and mechanisms. Moreover, the requisite authority for expansion should be obtained prior to program inception due to lengthy approval timelines. Program expansion will contribute to economies of scale on lower costs for all participants. Marketing outreach to potential partners should commence now during the program definition stage.

Currently, NFTC ends in 2021 while CFTS ends in 2027. This interim period provides both challenges and opportunities. Keeping in mind the lessons learned garnered from CFTS and NFTC it is recommended that the current NFTC fleets be acquired and extended through this period. In addition, the Crown should act as its own prime contractor with specific services contracted directly to sub-contractors. These two elements alone have potential savings in the hundreds of millions of dollars. In the long-term the future pilot training paradigm should maintain these two elements as core principles. Upon this basis must be built a properly resourced and modelled program with clearly understood performance measurement mechanisms adequately authorized to be marketed and expanded. This program should also recognize the importance of a healthy productive relationship with contractors. In so doing the RCAF will ensure the success of its future pilot training program and leverage the benefits of ASD while avoiding pitfalls.

Appendix 1: RCAF Pilot Training Phases (CFTS and NFTC)



*There are a small number of candidates (ten to twenty per year depending on RCAF requirement and candidate qualifications) who Bypass Phase I based on criteria established by the TMA.

**There are a small number of candidates (currently three to six per year depending upon RCAF requirement) who complete a modified Phase II on the Grob at CFTS. These candidates progress to either Phase III Helo or Phase III Multi-Engine.

Appendix 2: Contractor Survey Questions

1. What attracted your company to the military flying training industry?

2. From your perspective what elements of the contract worked best for your company?

3. What elements of the contract did not work well from a contractor perspective?

4. What would you like to see changed in the next contract with respect to contract language and structure?

5. What are your thoughts on how best to balance the RCAF's requirement for flexibility (surge, changing student loading, Training Plan changes etc.) and a company's desire for predictable revenue streams and profit?

6. What role does profit play in a company's outlook toward such a contract? What are company's profit expectations?

7. In such a large multi-year contract is a company expected to increase its ROE/Profit annually? Is it expected to grow revenue?

8. What has been your biggest hurdle in dealing with government contracting procedures?

BIBLIOGRAPHY

"Alternative Service Delivery." *Institute for Citizen Centred Service*, August:1999. Available from http://iccs-isac.org/en/clearinghouse/asd.htm; Internet; accessed 21 July 2014.

Beattie, LCol Clifford. "The Hypothetical Most Efficient Organization: The Fatal Flaw in the Alternative Delivery Process." Toronto: Canadian Forces College paper, n.d. Available from www.cfc.forces.gc.ca/259/181/51_beattie.pdf; Internet; accessed 8 October 2014.

Ben-Tahir, Idris. "Decades of Darkness." *Ottawa Citizen*, March 5, 2007. Available from http://www.canada.com/ottawacitizen/news/opinion/story.html?id=81b0a894-6704-4e8c-b175-2149a70c9542; Internet; accessed 26 September 2014.

Bombardier Aerospace. "Military Training." Available from http://www.bombardier.com/en/aerospace/specialized-aircraft/military-training.html; Internet; accessed 17 October 2014.

Bouchard, MGen C. *NATO Flying Training in Canada (NFTC) Program Performance.* 17 Wing Winnipeg: file number 2455-3 (A1 Trg), 8 June 2005.

Brewster, Murray. "National Defence struggling to staff mental health positions in remote outposts." *The Globe and Mail*, 30 November 2014. Available from http://www.theglobeandmail.com/news/national/somnia/article21840761/; Internet; accessed 30 November 2014.

Canada. Department of National Defence. DAOD 5001-2, *Maternity and Parental Benefits*. Available from http://www.forces.gc.ca/en/about-policies-standards-defence-admin-orders-directives-5000/5001-2.page; Internet; accessed 21 October 2014.

Canada. Foreign Affairs, Trade and Development Canada. "Baird Strengthens Canadian Relations with U.A.E." 13 November 2014. Available from http://www.international.gc.ca/media/aff/news-communiques/2014/11/13d.aspx?lang=eng; Internet; accessed 17 December 2014.

Canada. Foreign Affairs, Trade and Development Canada. "Canada's Strategy for Engagement in the Americas." 25 July 14. Available from http://www.international.gc.ca/americas-ameriques/stategy-strategie.aspx?lang=eng; Internet; accessed 17 December 2014.

Canada. Industry Canada. “General Overview of the Canada Corporations Act Part II.” Available from http://www.ic.gc.ca/eic/site/cd-dgc.nsf/eng/cs02167.html; Internet; accessed 20 October 2014.

Canada. Public Works Government Services Canada. “Annex D Performance Incentive Fee Plan Revision-2, Goose Bay Support Services Contract.” 1 October 2006.

Canada. Public Works Government Services Canada. “Canada Services Agreement in Support of the Training of Canadian Military Pilots between Her Majesty the Queen in Right of Canada and Bombardier Inc.” 12 May 1998.

Canada. Public Works Government Services Canada. “Contracted Flying Training and Support.” 28 October 2005.

Canada. Public Works Government Services Canada. “Statement of Work SOW 9177 for the NATO Flying Training in Canada (NFTC) Program.” 30 April 1998 and incorporating revisions to 19 December 2008.

Canada. The Standing Committee on Public Accounts. “Eighteenth Report.” June 2-4, 2003. Available from http://www.parl.gc.ca/HousePublications/Publication.aspx?DocId=1032272&Language=E&Mode=1&Parl=37&Ses=2; Internet; accessed 25 September 2014.

“Canada Settles Claim On Canceled Helicopters.” *New York Times Archives*, 24 January 1996. Available from http://www.nytimes.com/1996/01/24/business/international-briefs-canada-settles-claim-on-canceled-helicopters.html; Internet; accessed 23 June 2014.

“Canadian Forces Seek to Build Excellence in Foreign Flight Training.” *Defence Industry Daily*, February 22: 2011, Available from http://www.defenseindustrydaily.com/canadian-forces-seek-to-build-excellence-in-foreign-flight-training-01537/; Internet; accessed 29 October 2014.

“Collapse of the Soviet Union.” *Portulus.RU*, 4 Sep: 2007. Available from http://www.portalus.ru/modules/english_russia/print.php?subaction=showfull&id=1188915416&archive=&start_from=&ucat=11&; Internet; accessed 3 Oct 2014.

“Collapse of the Soviet Union 1989-1991.” *GlobalSecurity.org*, Available from http://www.globalsecurity.org/military/world/russia/soviet-collapse.htm; Internet; accessed 14 Sept 14.

Department of Finance Canada website, “Consolidated Revenue Fund Monthly Lending Rates for Periods of One Year and Over.” Available from; http://www.fin.gc.ca/admin/len/crf-tid-eng.asp?year=2005&month=06; Internet; accessed 8 November 2014.

Department of National Defence website, "Backgrounder: Canada's Flying Training History, NATO Flying Training in Canada, National Defence and the Canadian Forces," April 23, 1997. Available from http://www.forces.gc.ca/en/news/article.page?doc=nato-flying-training-in-canada/hnmx17ya; Internet; accessed14 October 2014.

Department of National Defence website, "Backgrounder: Contracted Flying Training and Support," March 30, 2005. Available from http://www.forces.gc.ca/en/news/article.page?doc=contracted-flying-training-and-support-cfts/hnocfoke; Internet; accessed 5 August 2014.

Department of National Defence website, Chief of Review Services, "Audit of Force Reduction Program," January 1997. Available from http://www.crs-csex.forces.gc.ca/reports-rapports/pdf/1997/705529-eng.pdf: Internet; accessed 15 July 2014.

Department of National Defence website, Chief of Review Services, "Evaluation of Aerospace Training and Readiness Part 1 – Air Force Initial Occupational Training," April 2012. Available from http://www.crs-csex.forces.gc.ca/reports-rapports/2012/187p0940-eng.aspx; Internet; accessed 29 October 2014.

"Euro-NATO Joint Jet Pilot Training Program, Sheppard Air Force Base." Available from http://www.sheppard.af.mil/library/factsheetspage/factsheet.asp?fsID=5168; Internet; accessed 15 October 2014.

Galvin, BGen M.P. *Visit Report - Royal Singapore Air Force [sic] (RSAF) and Royal Australian Air Force (RAAF) Pilot Screening and Trg Systems.* 17 Wing Winnipeg: file number 1776-1 (AF AOT), 3 January 2013.

Garfinkel, Michelle R. "The Economic Consequences of Reducing Military Spending." Federal Reserve Bank of St. Louis, Nov-Dec: 1990. Available from https://research.stlouisfed.org/publications/review/90/11/Spending_Nov_Dec1990.pdf; Internet; accessed 21 July 2014.

Lea Heide, Rachel. "NATO Air Training Plan." *The Encyclopedia of Saskatchewan*, n.d. Available from http://esask.uregina.ca/entry/nato_air_training_plan.html; Internet; accessed 5 Oct 2014.

Hines, Colonel Glynne. "Alternate Service Delivery: Managing to get it done right." National Security Studies Course Paper, Canadian Forces College, 2000. Available from http://www.cfc.forces.gc.ca/papers/nssc/nssc4/hines2.pdf; Internet: accessed 15 August 2014.

Hoyle, Craig. "T-6C to head UK military training renewal." *Flightglobal*, October: 2014. Available from http://www.flightglobal.com/news/articles/t-6c-to-head-uk-military-training-renewal-405203/; Internet; accessed 23 November 2014.

Kamery, Rob H. "A Brief Review of the Recession of 1990-1991." *Allied Academies International Conference 2004.* Available from *http://www.sbaer.uca.edu/research/allied/2004_maui/legal_ethical_regulatory_issues/14.pdf;* Internet; accessed 21 July 2014.

Kington, Tom. "Common Jet Pilot Training Falters." *Defence News*, 3 Dec: 2013. Available from http://www.defensenews.com/article/20131203/DEFREG01/312030021/Common-Jet-Pilot-Training-Falters; Internet; accessed 24 Nov 2014.

McLaughlin, Audrey. "Cold War Copters a waste of money." *The Toronto Star*, 28 July, 1992. Available from http://pqasb.pqarchiver.com/thestar/doc/436670291.html?FMT=ABS&FMTS=ABS:FT&type=current&date=Jul%2028,%201992&author=Audrey%20McLaughlin&pub=Toronto%20Star&edition=&startpage=&desc=Cold%20War%20'copters%20a%20waste%20of%20money: Internet; accessed 18 Sep 2014.

Motes, Kindred. "The Rise of Privatised Military Firms During and After the Cold War." University of Essex: Autumn 2013, Available from http://www.academia.edu/7170804/The_Rise_of_Privatised_Military_Firms_During_and_After_the_Cold_War; Internet; accessed 7 October 2014.

National Defence and the Canadian Forces website, "1994 White Paper on Defence." Available from http://www.forces.gc.ca/admpol/1994%20White%20Paper%20on%20Defence.htm; Internet; accessed 5 October 2014.

Office of the Auditor General of Canada website, "1999 November Report of the Auditor General of Canada," Chapter 27 – National Defence – Alternate Service Delivery. Available from http://www.oag-bvg.gc.ca/internet/docs/9927ce.pdf; Internet; accessed 25 August 2014.

Office of the Auditor General of Canada website, "2002 September Status Report of the Auditor General of Canada", Chapter 4 – National Defence – NATO Flying Training in Canada. Available from http://www.oag-bvg.gc.ca/internet/English/parl_oag_200209_04_e_12389.html; Internet; accessed 30 September 2014.

Office of the Auditor General of Canada website, "2006 May Status Report of the Auditor General of Canada," Chapter 3 – National Defence – NATO Flying Training in Canada. Available from http://www.oag-bvg.gc.ca/internet/English/parl_oag_200605_e_1118.html; Internet; accessed 25 August 2014.

Pellerin, Major H. "CT-156 Harvard II Estimates Life Expectancy." Briefing Note for DAEPM (FT), 09 April: 2014.

Plamondon, Aaron P. "The Politics of Procurement: Military Acquisition in Canada and the Sea King Helicopter." UBC Press: 2010. Availabel from http://books.google.ca/books?id=QLG-cyQbV_EC&pg=PA131&lpg=PA131&dq=jobs+lost+in+eh-101+cancellation&source=bl&ots=VBIJU9fSj-&sig=vEq62yyzziI5MM9wcGpm4au_qLg&hl=en&sa=X&ei=9HZhVJr-LOnuigKB34GACg&ved=0CE4Q6AEwCA#v=onepage&q=jobs%20lost%20in%20eh-101%20cancellation&f=false; Internet; accessed 3 October 2014.

Public Works and Government Services Canada website, "Procurement Management Manual", Available from http://www.tpsgc-pwgsc.gc.ca/biens-property/sngp-npms/bi-rp/conn-know/approv-procure/manuelga-pmmanual-2-eng.html; Internet; accessed 21 October 2014.

Rollason, Kevin. "Aviation Training Centre Takes Flight." *Winnipeg Free Press*, 14 September 2007. Available from http://www.winnipegfreepress.com/historic/32410714.html; Internet; accessed 30 October 2014.

Rostek, LCol Michael. "A Framework For Fundamental Change? The Management Command And Control re-engineering Initiative." *Canadian Military Journal*, no4 Vol 5. Available from http://www.journal.forces.gc.ca/vo5/no4/manageme-gestion-eng.asp; Internet; accessed 21 July 2014.

Samyn, Paul. "Portage Contract $2.3 Billion Windfall." *Winnipeg Free Press*, 22 March 2005. Available from http://www.shindico.com/index.php?option=com_content&view=article&id=115&catid=5&Itemid=26; Internet; accessed 27 October 2014.

Savoie, David J. "Summerside: Revisit the Base Closures." *Canadian Journal of Regional Science*, Spring: 1995. Available from http://cjrs-rcsr.org/archives/18-1/4-Savoie.pdf; Internet; accessed 9 October 2014.

Shadwick, Martin. "The Chrétien Legacy." *The Canadian Military Journal*, vol 4 no. 4. Available from http://www.journal.forces.gc.ca/vo4/no4/comment-eng.asp; Internet: accessed 25 July 2014.

Sokolsky, Joel. “Canada, Getting it Right this Time: The 1994 Defence White Paper.” *US Army War College*. 31 May1995. Available from www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA297786; Internet; accessed 10 Oct 2014:

Stephens, Major Jennifer M. “Delivering Value Through Logistics.” *Army Logistician*, November-December: 2008. Available from http://www.almc.army.mil/alog/issues/NovDec08/delivervalue_spectrum.html; Internet; accessed 7 October 2014.

“Strategic, Core and Non-Core Activities: What to outsource for best results?” *Intetics: The Remote In-Sourcing Company*, 02 April: 2014. Available from http://www.intetics.com/strategic-core-and-non-core-activities-what-to-outsource-for-best-results/; Internet; accessed 21 July 2014.

Thibault, LCol G. “Hawk ROM Capacity Assessment to 2027 based on extrapolation of 135 FI.” Briefing Note, 9 October: 2014.

Wilson, Honourable Michael H. *The Budget Speech 1989*, 27April: 1989. Available from; http://www.budget.gc.ca/pdfarch/1989-sd-eng.pdf; Internet; accessed 23 October 2014.