



# THE SCHOOL OF PUBLIC POLICY

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## MASTER OF PUBLIC POLICY

## CAPSTONE PROJECT

Sole Source Procurements and the Royal Canadian Air Force

**Submitted by:**

Ivan Ho

**Approved by Supervisor:**

Dr. David J. Bercuson

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## **Capstone Executive Summary**

In the last ten years, the Canadian Forces underwent an extensive reformation and in the process defence equipment was acquired to fulfill urgent international and domestic operations. The Canadian government reinvested in procuring new capabilities for the RCAF from Search and Rescue to Strategic Airlift. Due to operational urgency, DND procured off-the-shelf items and bypassed the traditional procurement procedures. However, in the process, defence equipment faced scheduled delays while others were a smooth transition and immediately deployable. This study examines and compares four case studies to determine important procurement practices and challenges in off-the-shelf procurement. There are a number of lessons available for Canadian defence policy-makers in re-equipping the Canadian Forces in a time of operational urgency.

## Introduction

During the early 1990s, the Canadian economy suffered a deep recession. In an effort to curb federal spending, Jean Chrétien's Liberal party vowed to rein in the deficit.<sup>1</sup> Coupled with the disintegration of the Soviet Union and the fall of the Berlin Wall, defence expenditure was seen as an easy target for spending cuts. The Liberal Party drastically cut the Canadian Forces (CF) military expenditures by 30%.<sup>2</sup> However, the CF continued to provide peace support operations including humanitarian intervention, combat operations and even large-scale disaster relief.<sup>3</sup> CF operational tempo remained high with peace-keeping operations in countries such as Timor, Rwanda, and Somalia. As a result of continuous military operations and with severe budget cuts, the military faced an increasing problem of both personnel burnouts and equipment rust out.<sup>4</sup> General Rick Hillier, former Chief of the Defense Staff, labelled this period of fiscal restraint as a decade of darkness, where the CF suffered a dramatic reduction of personnel, level of training and capabilities.<sup>5</sup>

By 2004, the problem of underfunding became readily apparent when the CF struggled to support ongoing NATO operations in Afghanistan. From 2004 to 2006, the CF was forced to conduct an operational pause to rest, reorganize and evaluate long term planning as the government's budget fell short to infuse necessary capital into the armed forces.<sup>6</sup> Although the CF performed admirably, the price to pay in terms of capital deterioration and personnel burnouts was extraordinarily high. In 2005, the Standing Committee on National Security and Defence (SCONDA) was tasked to study the problem and concluded that the CF was undermanned, underequipped, and underfunded.<sup>7</sup> The committee indicated that across all three services, CF personnel were using out-dated equipment with inadequate training and lacked trained personnel to conduct international or domestic missions.

Specifically, the land forces had trouble training soldiers to maintain acceptable operational readiness standards and resorted to cannibalizing equipment for troops rotating into deployments.<sup>8</sup> For instance, training on night vision equipment was prioritized for soldiers heading into Afghanistan. The CF was clearly short of equipment essential to their training and survival in the field.

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<sup>1</sup> Peter Jones & Phillippe Lagasse, "Rhetoric versus Reality: Canadian defense planning in a time of austerity," *Defense and Security Analysis*, 28:2, 140-151, 2012, 141. *Defense and Security Analysis*, 28:2, 140-151, 2012, 141.

<sup>2</sup> *Ibid.*, 141.

<sup>3</sup> Martin Shadwick, "The Chrétien Legacy," *Canadian Military Journal*, accessed on 26 Nov 13, <http://www.journal.forces.gc.ca/vo4/no4/comment-eng.asp>

<sup>4</sup> *Ibid.*,

<sup>5</sup> Mark Blanchfield, "Top general calls Liberal rule 'decade of darkness,'" *Ottawa Citizen*, 17 Feb 2007, <http://www2.canada.com/ottawacitizen/news/story.html?id=d569d0fb-d9cf-4119-84cb-39dd89571625>.

<sup>6</sup> Canada. Parliament. Senate. Senate Committee on National Security and Defence. Interim Report. Wounded: Canada's Military and the Legacy of Neglect, Our Disappearing Options for Defending the Nation Abroad and at Home. September 2005. [Ottawa], 2005. <http://www.parl.gc.ca/content/sen/committee/381/defe/rep/repintsep05-e.pdf>

<sup>7</sup> *Ibid.*,

<sup>8</sup> *Ibid.*,

The same issues were mirrored in the navy as it faced the monumental task of maintaining ships in a high operational tempo; this included rotating sixteen of eighteen warships and 95% of its sailors through the Arabian Gulf from 2001 to 2003.<sup>9</sup> As the committee noted, the navy was forced to continuously patch its equipment instead of instituting a strategic planning cycle to purchase and repair operationally-required equipment.<sup>10</sup>

Lastly, the Royal Canadian Air Force (RCAF) suffered severe underfunding, which resulted in problems in sustaining critical capabilities. They could not afford to maintain and change the fleet of out-dated equipment due to a budgetary shortfall of \$608 million dollars.<sup>11</sup> Despite large budget cuts, the Department of National Defence (DND) required the Air Force to sustain the same level of operational tempo as it did in 1994 with less capabilities, personnel, and equipment.<sup>12</sup> Overall, the RCAF suffered an extensive reduction in capabilities ranging from tactical and strategic airlift, maritime patrol, and critical battlefield surveillance. For instance, the helicopter fleet that had ranged from Chinooks, Hueys, and Kiowas was consolidated into a single platform – the CH-146 Griffon. Each platform performed a different role and operational mission. For instance, former Major-General Andrew Leslie Canadian Deputy Commander of the International Security Assistance Force (ISAF) noted that “it would have been useful if his force possessed a more powerful helicopter with a greater lift capacity than the Griffon.”<sup>13</sup> Moreover, the committee noted that aging Buffalos and Hercules that performed the critical role of domestic Search and Rescue (SAR) needed to be quickly replaced. The combination of out-dated and aging equipment with the lack of trained aircraft technicians and pilots drastically reduced operational readiness; equipment was required to spend more time in repair for refit and maintenance.<sup>14</sup>

In 2006, the Conservatives campaigned on a promise to reinvest in the CF with a large injection of capital to procure new equipment and expand personnel strength.<sup>15</sup> At the same time, the CF resumed NATO operations and shifted operations to the volatile Kandahar province. CF troops conducted combat patrols and engaged Taliban insurgents around the Panjwai district. As the fighting escalated, the CF lacked a number of capabilities to effectively combat Taliban fighters and safeguard its soldiers. In 2005, Minister of Defence Bill Graham “acknowledged that the CF would not have all of the equipment it needed for the deployment to Kandahar.”<sup>16</sup> Defence equipment was quickly procured for the CF to meet urgent operational requirements. Procurement projects became sole-sourced with a focus on off-the-shelf models that were

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<sup>9</sup> Ibid.,

<sup>10</sup> Ibid.,

<sup>11</sup> Ibid.,

<sup>12</sup> Ibid.,

<sup>13</sup> Ibid.,

<sup>14</sup> Ibid.,

<sup>15</sup> “Protecting Canada,” Conservative, accessed 04 April 12, [http://www.conservative.ca/?page\\_id=1888](http://www.conservative.ca/?page_id=1888)

<sup>16</sup> Dianne Demille and Stephen Priestly, “Canadian Medium-Lift Helicopters in Afghanistan – Five years Later Updating Hillier’s Hope for ‘Honking Huge’ Helicopters for Kandahar,” *Canadian American Strategic Review*, November 2010, <http://www.casr.ca/ft-helicopters-5-years-on-1.htm>

combat ready and proven platforms. Equipment urgently needed for domestic or international operations bypassed normal procurement procedures. The government, military, and public service “joined in a co-operative effort to get Canadian troops their clothing, weapons, and equipment to do the job we have sent them to do.”<sup>17</sup> However, the story was a mixed success. Items like the C-17, M777, and Mine Resistant Vehicles were immediately procured and deployed for soldiers stationed overseas. On the other hand, problems with certain equipment like the Chinook surfaced. Chinooks were identified as a priority as they were utilized to move soldiers safely across the southern Kandahar province. Delays forced Boeing to push delivery dates back to 2013, as Canadian soldiers withdrew from Afghanistan.

### Purpose of Study

The purpose of this study was to examine off-the-shelf (OTS) procurements that were urgently required for international and domestic operations. When defining a procurement project by DND staff, specifications were added onto capital acquisition projects that increased schedule delays. This is also known as “Statement of Requirements Creep.” This occurs when mandatory requirements are added onto projects in trying to “Canadianize” procured equipment; modifications of equipment exacerbated delay, drove up costs, and the project became too complex. This problem was particularly acute for commercial-off-the-shelf (COTS) / military-off-the-shelf (MOTS) identified items that should be straight-forward purchases.

This paper focuses solely on air assets with particular considerations for the historical underfunding of the air force. As well, these procurements tend to be capital intensive. The study examines four case studies (Chinook 147F, FWSAR, CC-177, and CC-130J) and their acquisition cycle to determine strengths and weaknesses. Through the case studies, the author identifies more efficient procedures in capital acquisition projects and how to control scope creep in the SOR at the front end of the procurement process in OTS purchases. The primary goal of this study is to develop a better understanding of the sole-source procurement process and to draft recommendations to identify efficient and successful methods when acquiring OTS equipment. In essence, the author will examine the right processes and procedures that DND successfully conducted to quickly procure certain equipment. Subsequently, DND must employ sound policies to guide capital acquisitions, especially in the OTS procurements, to ensure soldiers are receiving the best possible equipment efficiently and immediately. This is especially true in times of conflict and emergencies, where soldiers need the right equipment to execute the mission. Moreover, defence procurement is an important issue as major capital defence equipment within the CF inventory is “rusting out.”

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<sup>17</sup> Canada. Parliament. Senate. Senate Committee on National Security and Defence. Interim Report. Wounded: Canada’s Military and the Legacy of Neglect, Our Disappearing Options for Defending the Nation Abroad and at Home. September 2005. [Ottawa], 2005. <http://www.parl.gc.ca/content/sen/committee/381/defe/rep/repintsep05-e.pdf>

## Literature Review

The purpose of the literature review is to examine the current process in order to understand the defence procurement cycle and to develop a familiarity with how DND acquires its capital equipment. This is important to understanding the regulations, institutional processes, and key players that constitute defence capital acquisition. An insight in the literature review identifies problems and weaknesses within the current defence procurement structure. More importantly, it provides directions on how the system can be improved upon when pursuing sole-sourced contracts and OTS procurements.

## Rules and Regulations

Defence procurement is governed by the Agreement on Internal Trade (AIT) that is binding on Federal, Provincial, and Territorial governments. AIT is the only agreement that specifies defence goods, as it was drafted with provincial insistence on including defence goods and services in the agreement. The purpose of the AIT is to provide a framework to ensure fair and equal access to Canadian suppliers; thus, this would reduce costs and develop a strong economy within the context of transparency and efficiency.<sup>18</sup> Goods above the threshold of \$25,000 and services above \$100,000 are subject to the AIT, which included the provision of a bid challenge before a quasi-judicial tribunal.<sup>19</sup> Article 506 details a competitive process for defence goods and a call for tenders to be made through an electronic system or through predetermined publications.<sup>20</sup> This indicates that defence procurement must go through an open and competitive process with competing proposals from different suppliers.

There are exceptions with respect to open competition, as previously mentioned when DND had to quickly procure items for the Afghanistan mission. Clauses under Article 506.11 and 12 can speed up purchases when the need arises.<sup>21</sup> For instance, an Advance Contract Award Notice (ACAN) was used in two of the case studies: medium-lift helicopters and strategic airlift.<sup>22</sup> A similar process was used when acquiring the C-130J that bypassed normal procurement procedures. Lastly, the FWSAR project was a planned sole-source contract for the C-27J Spartan as the preferred supplier.<sup>23</sup> An ACAN allows departments and agencies to post a

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<sup>18</sup> Canadian suppliers means any company that has a place of business within Canada, "Agreement on Internal Trade – Chapter Five Procurement," Industry Canada, accessed 12 April 14, <http://www.ic.gc.ca/eic/site/ait-aci.nsf/eng/il00006.html#G>

<sup>19</sup> Alan S. Williams, "Reinventing Canadian Defence Procurement: A View from the Inside," (Montreal: McGill-Queens University Press, 2006), 8.

<sup>20</sup> By definition, Canadian suppliers mean any company that has a place of business within Canada. "Agreement on Internal Trade – Chapter Five Procurement," Industry Canada, accessed 12 April 14, <http://www.ic.gc.ca/eic/site/ait-aci.nsf/eng/il00006.html#G>

<sup>21</sup> See Appendix for further details.

<sup>22</sup> Steven Staples, "No Bang for the Buck: Military Contracting and public accountability," Canadian Centre for Policy Alternatives," Volume 2 Issue 2, June 2007, [http://www.policyalternatives.ca/sites/default/files/uploads/publications/National\\_Office\\_Pubs/2007/no\\_bang\\_for\\_buck.pdf](http://www.policyalternatives.ca/sites/default/files/uploads/publications/National_Office_Pubs/2007/no_bang_for_buck.pdf)

<sup>23</sup> Ibid.,



notice indicating to suppliers that it intends to award a good or service to a pre-determined contractor.<sup>24</sup> Potential suppliers can challenge the ACAN and if they meet the requirements the contract must proceed to a full tendering process.<sup>25</sup> Finally, Article 1804 or the National Security Clause can bypass the AIT when invoked.<sup>26</sup>

### Procurement Process

The Defence Management System (DMS) is an integral part of the defence procurement cycle that built a basic project management guideline. Reformed in 1998, the DMS remains as a fundamental framework to ensure the effective delivery of the Defence Services Plan (DSP).<sup>27</sup> As Craig Stone observed, the DMS “is a linkage between defence policy and departmental planning; an overall strategic resource management framework; a department-wide process for performance measurement; and a detailed framework for reporting to government.”<sup>28</sup> Thus, the goal of the DMS is to translate policy objectives into a strategic plan and actions. The system consisted of five steps that are integral for effective project management:

1. Problem Identification: A description of the requirements that must be satisfied and a decision to pursue a resolution
2. Options Analysis: An examination of options including risks and opportunities against the requirements in order to find an optimal solution
3. Definition: The creation of a detailed plan that outlines costs and risk estimates for the implementation of the selected option
4. Implementation: Activities leading up to the acquisition and delivery of equipment, infrastructure, or service, which satisfy the requirement defined in the definition phase. This phase includes the management and monitoring of resources to ensure that the project delivers the outputs within the defined time and cost constraints.
5. Close out: Project is finished and reporting is finalized.<sup>29</sup>

### Statement of Requirements

As previously mentioned, the finalization and approval of a Statement of Requirements (SOR) is a significant factor in delaying a defence procurement project.<sup>30</sup> The SOR is a document that provides a “broad description of the nature of the requirement”<sup>31</sup> and this could

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<sup>24</sup> Ibid.,

<sup>25</sup> Ibid.,

<sup>26</sup> See Appendix for more details

Alan S. Williams, “Reinventing Canadian Defence Procurement: A View from the Inside,” 14.

<sup>27</sup> Craig Stone, “Defence Procurement and the need for Disciplined Capital Investment,” Chapter 5 in *The Public Management of Defence in Canada*, edited by Craig Stone. (Queens University: Breakout, 2009), 101.

<sup>28</sup> Ibid., 102.

<sup>29</sup> Ibid., 102.

<sup>30</sup> Alan S. Williams, “Reinventing Canadian Defence Procurement: A View from the Inside,” 39.

<sup>31</sup> “Statement of Requirements,” Public Works and Government Services Canada, accessed 14 April 14, <http://www.tpsgc-pwgsc.gc.ca/biens-property/sngp-npms/bi-rp/livra-deliv/exigences-requirements/index-eng.html>

refer to a capability or a particular platform necessary for one or more of the planning scenarios.<sup>32</sup> The SOR is initially prepared by the military under the options phase and reviewed by an internal senior review board (SRB) to oversee the project. It is finalized within the project definition phase.<sup>33</sup> It is at the SOR stage that complications begin and minimum requirements turn into a wish list of capabilities rather than operational needs.<sup>34</sup> There are cases where the SOR did not fully reflect the end product and as a result the project fell behind schedule and outside of the budget. According to the Chief Review Services (CRS), one of the significant sources of delay is the development and refinement of the SOR, a document that can span volumes and takes years to complete. The CRS noted that moving to a simple-based performance contract would cut down on time.<sup>35</sup> This conclusion was echoed by academics and policy officials such as Alan S. Williams. Williams, with a wealth of experience in defence procurement as the former Assistant Deputy Minister of Material, noted that the ideal SOR encouraged performance requirements with an end state.<sup>36</sup> Moreover, Williams commented that mandatory requirements should be kept to a minimum to encourage competition and solutions from industry.<sup>37</sup>

### Methodology and Data Collection/Analysis

This study utilizes a qualitative case study approach to examine and analyze four procurement projects to identify problems within the capital acquisition process. This study uses a comparative and descriptive case study approach to highlight the different outcomes in each procurement project. The research study involved gathering and collecting data from primary and secondary data sources such as archival and government databases. For each case study, the author then observes themes within the literature. Sources are used to construct background and contextual information to identify patterns and to conduct further analysis, including a short history of the project. Information collected will be collated and used to lay out a detailed analysis on program management and will be especially focused on the SOR.

Within each case study, the author systematically analyzes the background context, procedures, and steps involved. By doing so, the study illustrates the different complex variables within the capital acquisition process. As a result, through this study, the author produces recommendations and optimal solutions to streamline capital defence acquisitions and reduce delays and costs when procuring OTS products

### Case Study Selection

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<sup>32</sup> Ibid.,

<sup>33</sup> Alan S. Williams, "Reinventing Canadian Defence Procurement: A View from the Inside," 38.

<sup>34</sup> Admiral (retired) Ron Buck, "Blue Ribbon Panel for Defence Procurement," *Frontline Defence* 2 (2013), 8.

<sup>35</sup> Canada. National Defence. Chief Review Services. *Perspectives on the Capital Equipment Acquisition Process*. [Ottawa], 2006, <http://www.crs-csex.forces.gc.ca/reports-rapports/pdf/2006/P0757-eng.pdf>

<sup>36</sup> Alan S. Williams, "Reinventing Canadian Defence Procurement: A View from the Inside," 39.

<sup>37</sup> Ibid., 39.

This section illustrates the reasoning behind the selection of the four case studies used in this study. As previously mentioned, four procurement projects are used in comparing the different outcomes that occurred. The cases were chosen for their similar variables and attributes. Each procurement project shared an approximate time frame from 2002 to 2009, determined through official announcements by DND with the initialization of the project. Moreover, each case was identified as an urgent need for operational missions within a domestic or international context. All four platforms were required to be an OTS model for expedited approval. The study focuses on air-force acquisitions and platforms, as they tended to be high-technology and capital intensive. As well, the RCAF has faced severe underfunding and the state of capital equipment within the air-force branch is rusting out.

### Strengths and Limitations

The key strengths of the study are the use of pragmatic examples to facilitate a deeper understanding of the SOR process using Canadian case studies. This highlights issues at the front-end of the procurement cycle. In essence, through the use of case studies, the paper will examine the relationship of complex variables with a holistic approach. Moreover, the study will be useful for further defence procurement studies and can be applied to OTS projects outside the air-force branch.

There are limitations to this study as the procurement process has recently changed with the new Defence Procurement Strategy being implemented at the time of writing. As well, the parameters of the study only examine the front-end of the procurement cycle and focuses on a specific aspect, that is, OTS platforms. Developmental projects, the F-35 for instance, face different issues that will not be covered. Also, this study does not examine other procurement issues that are prominent in the literature, nor is it a broad overview of the procurement cycle. This research paper is not a comprehensive approach to the study of defence procurement but is predominantly concerned with the front end of the procurement cycle.

### Findings

#### **CH-147 Chinook**

##### Background

In 1991, the Mulroney government, citing the concern for increasing costs to maintain and operate, sold the Chinook helicopter to the Dutch government. DND believed that a medium-lift capability was unnecessary and an expensive option; it was cheaper to consolidate the helicopter fleet into a single platform. This would reduce costs in terms of training and procuring spare parts. However, during Canadian military operations that spanned from 2001 to 2006, the need for a medium-lift helicopter was identified by DND as an emerging operational need. This was echoed by General Rick Hillier who noted Chinooks or similar medium-lift

helicopters were a top priority for the Afghanistan mission.<sup>38</sup> The CF required a rotary platform to ferry soldiers and supplies from the Kandahar airfield to small combat outposts across the southern province. As the *National Post* reported, American soldiers routinely used Chinooks to ferry soldiers and cargo across Afghanistan that greatly reduced the risk of casualties from Improvised Explosive Devices (IED).<sup>39</sup> Moreover, the CF had no rotary aircraft able to fly in the extreme heat and mountainous terrain of Afghanistan; subsequently, Canadian soldiers were forced to run resupplies using over-land convoys that increased the risk of hitting mines, IEDs, and suicide bombers. Commander of the Canadian battle-group, Lieutenant-Colonel Ian Hope, said in a recent interview that convoys have produced a risk that is avoidable with helicopter flights.<sup>40</sup> The CF relied exclusively on American Chinooks to provide troop transportation and resupplies to bases. This has caused a serious strain on ISAF resources and shuffled the CF to the bottom of American's overloaded priority list.

In 2006, to the relief of Canadian commanders and military leaders, the Conservative government announced the procurement purchase of 16 medium-tactical lift helicopters with an ACAN for newly built CH-147F Chinooks. In June 2006, the National Defence approved several high level mandatory requirements in the SOR including:

- Internal lift capacity and the ability to carry 30 soldiers and full combat equipment weighing a total of at least 4,763 kilograms;
- External lift capacity: ability to lift multiple loads, weighing a total of at least 5,443 kilograms;
- Minimum flying range of 100-kilometre radius with either the internal or external payload outlined above and at the temperature and altitude set out below;
- Able to provide the lift and flying range outlined above at a temperature of 35°C and altitude of 1,220 metres above sea level;
- Airworthiness certification of the aircraft to standards recognized by Canada by contract award date;
- Minimum fleet size of 16 helicopters, to be housed at two main operating bases; and
- Delivery of the first aircraft no later than 36 months after contract award and delivery of the final aircraft no later than 60 months after contract award.<sup>41</sup>

The SOR also included 136 rated requirements that were not mandatory, but would affect the operational capabilities if they were not met. The delivery requirements highlight an aggressive schedule that could only be met through an OTS platform for immediate use.

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<sup>38</sup> Dianne DeMille and Stephen Priestly, "Hillier's Hopes for the Holidays – Honkin' Huge Helicopters," *Canadian American Strategic Review*, October 2005, <http://www.casr.ca/ft-hillier1.htm>

<sup>39</sup> National Post, "Allies Stunned Canadian troops lack helicopters," *National Post*, accessed 14 April 14, <http://www.nationalpost.com/news/story.html?id=9689fab6-ecfd-4bed-8c06-925f8254cd1e>

<sup>40</sup> *Ibid.*,

<sup>41</sup> Canada. Office of the Auditor General. *Report of the Auditor General to the House of Commons – Chapter 6: Acquisition of Military Helicopters*, [Ottawa], 2006. [http://www.oag-bvg.gc.ca/internet/english/parl\\_oag\\_201010\\_06\\_e\\_34289.html](http://www.oag-bvg.gc.ca/internet/english/parl_oag_201010_06_e_34289.html)

In 2008, the Request for Proposal (RFP) was made to Boeing in 2008 for 16 CH-147F Chinook variants. The cost of purchasing, providing In-Service Support (ISS) and training personnel for fifteen helicopters (due to costs DND reduced the order by one) were 4.9 billion.<sup>42</sup> However, problems began to surface with the procurement, as orders were placed in 2009 but deliveries were not available until 2013 and 2014. The delivery dates coincide with the withdrawal of Canadian soldiers at the end of 2013. Moreover, the CF ended their combat operations in 2011 with a move into training the national security forces in Afghanistan.<sup>43</sup> Thus, the requirement for a Chinook was not as urgent following the reduction of combat missions and the emphasis on training the Afghan National Army (ANA). Even amid the parliamentary reports and political pressure for Chinooks, Public Works and Government Services (PWGSC) announced that the delivery time of CH-147F Chinooks would not meet Canada's ongoing commitments in Afghanistan.<sup>44</sup> Instead, the procurement will be used to equip the CF over the longer term. However, pressure from the Manley Report (an independent panel on Canada's future role in Afghanistan) saw the formation of Joint Task Force Afghanistan Air-Wing with the immediate purchases of six CH-147D Chinooks from the U.S. for a total cost of \$375 million.<sup>45,46</sup> Moreover, just after two years of use, the DND auctioned off the CH-147D variants to allies in theatre. The air-force cited the high costs of maintaining the D models and with the procurement of F variants there was not an emphasis for continuing the support of the D model.<sup>47</sup>

### Challenges to the Procurement Purchase of CH-147F

A question arises: what resulted in the procurement delays that saw the need for a stop-gap measure for medium-lift helicopters? The main source of criticism was from the Office of Auditor General (OAG) that heavily criticized DND for failing to properly manage the project. The project had ill-defined project requirements that resulted in significant modifications on the Chinook air-frame without proper approval and review from the Project Management Board (PMB).

### Ill-defined Project Guidelines

As the OAG noted, before and after 2006, DND officials were unclear on the exact details of the Chinook project. During the procurement project, important questions that would

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<sup>42</sup> Ibid.,

<sup>43</sup> "History of Canada's Engagement in Afghanistan 2001-2014," Afghanistan, accessed 14 April 14, <http://www.afghanistan.gc.ca/canada-afghanistan/progress-progres/timeline-chrono.aspx?lang=eng>

<sup>44</sup> Defence Industry Daily Staff, "On the Verge: Canada's \$4B+ Program for Medium-Heavy Transport Helicopters," Defence Industry Daily, 27 June 2013, <http://www.defenseindustrydaily.com/on-the-verge-canadas-47b-program-for-mediumheavy-transport-helicopters-02390/>

<sup>45</sup> The Manley Report recommended that if Canada was to extend the mission in Afghanistan beyond 2011, the government should purchase UAVs and Helicopters for the ISAF mission. In particular, helicopter lift is needed to protect Canadian soldiers against IEDs by reducing the reliance on transporting soldiers and supplies through convoys.

Canada. Independent Panel. *Independent Panel on Canada's Future Role in Afghanistan*, [Ottawa], 2008, [http://www.afghanistan.gc.ca/canada-afghanistan/assets/pdfs/Afghan\\_Report\\_web\\_e.pdf](http://www.afghanistan.gc.ca/canada-afghanistan/assets/pdfs/Afghan_Report_web_e.pdf)

<sup>46</sup> "Joint Task Force Afghanistan Air Wing," National Defence and the Canadian Armed Forces, accessed 14 April 14, <http://www.forces.gc.ca/en/operations-abroad-past/op-athena-jtfaaw.page>

<sup>47</sup> Murray Brewster, "Canadian Chinook helicopters being auctioned off as combat mission ends," *The Globe and Mail*, 18 Dec 2012, <http://www.theglobeandmail.com/news/politics/canadian-chinook-helicopters-being-auctioned-off-as-combat-mission-ends/article564527/>

define the specific capability that DND required were unresolved such as: What types of operations are to be supported? What missions systems will be needed? What is the minimum number of helicopters that will be needed? Will the medium-tactical lift helicopters need one or two main operating bases?<sup>48</sup> Configurations of the Chinook shifted as decisions on the type of operations the Chinook would perform and as costs became clearer with discussions between Boeing and Canadian officials. However, what is important to note is that the mandatory high level requirements in the SOR could be met with the basic Chinook model (the D variant).<sup>49</sup> Indeed, the Afghanistan mission saw the purchases of Chinook D models from the American government that were quickly pushed into action. As the OAG highlights, after discussions with Boeing, DND drew from additional rated operational requirements, “effectively treating extended-range fuel tanks, an upgraded electrical system, and aircraft survivability equipment as mandatory requirements, though none had been originally identified as such.”<sup>50</sup> The next section will detail the specific technical requirements that crept into the document. As a result, in 2007, Boeing informed DND that these modifications would cause massive delays in the delivery schedule and increase the cost per unit. The complexity of these modifications drove up the cost and added two years in the contracting process to implement the changes.<sup>51</sup> As the OAG highlighted, “ultimately, National Defence’s requirements were not finalized until 2009 when the contract with Boeing was signed.”<sup>52</sup> By the time the contract was awarded in 2009, one of the high level mandatory requirements had to be changed with the original order of sixteen reduced by one to meet the budget. As well, scheduled delivery (a mandatory requirement) of the Chinooks was not met, because of the added delays through modifying the helicopter.<sup>53</sup> The constant shifting objectives during the drafting and preparing of the SOR would translate into uncertainty in the project. DND officials were not clear or concise in the type of missions that the Chinook would perform and, consequently, the Chinook became a “frankenspec.”

### Modifications

DND requested significant modifications to the basic variation of the Chinook and these improvements or additional capabilities translated into:

- Modified Rockwell Collins Architecture System Glass
- Enhanced Navigation and Communication System
- Forward Looking Infrared System

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<sup>48</sup> Canada. Office of the Auditor General. *Report of the Auditor General to the House of Commons – Chapter 6: Acquisition of Military Helicopters*, [Ottawa], 2006. [http://www.oag-bvg.gc.ca/internet/english/parl\\_oag\\_201010\\_06\\_e\\_34289.html](http://www.oag-bvg.gc.ca/internet/english/parl_oag_201010_06_e_34289.html)

<sup>49</sup> “Canadian Forces Medium-to Heavy-Lift Helicopter (MHLH) MERX Boeing CH-47 Chinook Boeing, *Canadian American Strategic Review*, accessed 14 April 14, <http://www.casr.ca/doc-acan-chinook.htm>

<sup>50</sup> Canada. Office of the Auditor General. *Report of the Auditor General to the House of Commons – Chapter 6: Acquisition of Military Helicopters*, [Ottawa], 2006. [http://www.oag-bvg.gc.ca/internet/english/parl\\_oag\\_201010\\_06\\_e\\_34289.html](http://www.oag-bvg.gc.ca/internet/english/parl_oag_201010_06_e_34289.html)

<sup>51</sup> Ibid.,

<sup>52</sup> Ibid.,

<sup>53</sup> Ibid.,

- Terrain Avoidance System
- Defensive Electronic Warfare System: comprised of a missile approach warning system and counter measure devices
- Fast Rope Insertion and Extraction.<sup>54</sup>

In the end, DND officials were asking for a combination of the MH-47G Special Operations Variant and the HH-47 Combat Search and Rescue Variant of the Chinook helicopter.<sup>55</sup> Canada was asking for a multi-mission helicopter to perform transport duties and SAR operations. As the adage goes, the Chinook was a “jack of all trades and a master of none.”

The initial SOR provided simple performance specifications that saw the need for the Chinook; however, “technical” requirements crept into the document. This would have huge implications for the project. As mentioned before, the Department of National Defence requested extended-range fuel tanks be incorporated into the Chinook air-frame. These changes required an additional 12 months to test for airworthiness and safety certifications and an additional \$360 million dollars for engineering costs for Boeing to incorporate the modifications.<sup>56</sup> Thus, it is evident that the CH-147F Chinook would not be an off-the-shelf procurement as complex modifications essentially created an entirely new “Canadianized” variant of the aircraft. So significant were the modifications that the final contract awarded to Boeing contained a provision to recover the costs should another customer buy the Canadianized version of the Chinook in the future.<sup>57</sup> Sharon Hobson, a defence correspondent with *Jane’s Defence*, discovered that Boeing’s accommodations for the modifications would require “setting up a specific production line for that modification, which would increase costs for Canada.”<sup>58</sup>

More concerning is the fact that DND sought and planned for significant modifications to the Chinook and expected schedule delay as well as an increase in costs. However, expected changes were never presented to the Treasury Board when seeking preliminary approval for the project.<sup>59</sup> Yet, internal decision-makers described the Chinook as an “off the shelf solution, taking advantages of helicopters in production and incorporating existing technologies” while Canadian requested modifications “were to be adopted only when essential.”<sup>60</sup> Although the statement proved to be vague, the adoption of modifications drew from the rated requirements that were not mandatory. Ultimately, these new variations resulted in schedule delays and cost increases by 70% and a delay of two years.<sup>61</sup> This leads to a question of how much

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<sup>54</sup> Ibid.,

<sup>55</sup> Ibid.,

<sup>56</sup> Ibid.,

<sup>57</sup> Ibid.,

<sup>58</sup> Sharon Hobson, “Canadian CH-47 acquisition plan encounters delays,” *JANES Defence Weekly*, 12 Oct 2007.

<sup>59</sup> Canada. Office of the Auditor General. *Report of the Auditor General to the House of Commons – Chapter 6: Acquisition of Military Helicopters*, [Ottawa], 2006. [http://www.oag-bvg.gc.ca/internet/english/parl\\_oag\\_201010\\_06\\_e\\_34289.html](http://www.oag-bvg.gc.ca/internet/english/parl_oag_201010_06_e_34289.html)

<sup>60</sup> Ibid.,

<sup>61</sup> Ibid.,

“Canadianization” should be involved in OTS procurement. The original objective was the immediate procurement of Chinooks to provide support to soldiers in Afghanistan. In this regard, the Chinook procurement had failed. There are no policy guidelines on OTS procurements. In contrast, the Americans define an off the shelf solution as a commercially available hardware that requires little or no modifications to meet the needs of a procuring agency.<sup>62</sup>

### Lack of Project Oversight

Lastly, the OAG discovered that the project lacked compliance from project management standards. Accordingly, challenges and approvals by senior boards were noticeably absent during the process to acquire the Chinook.<sup>63</sup> Project decisions at critical points were not finalized or reviewed by the Senior Review Board (SRB) or by the Project Management Board (PMB).<sup>64</sup> The OAG noted that there were large gaps in oversight at critical junctions in the decision-making process that were important to review documentation and ensure proper project control.<sup>65</sup> As a result, significant changes and modifications to the SOR and project were made without the approval of senior personnel. Between 2006 and 2009, the SRB did not monitor the progress of the project, thus deviating from the Project Approval Guide and from checks designed to control the scope of the project.<sup>66</sup> The SRB had no records or a paper trail indicating that they had approved key documents such as the SOR, Project Charter, or any profile risk assessments.<sup>67</sup> The lack of proper approval led to improper project management and “scope creep” with significant modifications added onto the project.

### **Fixed Wing Search and Rescue (FWSAR)**

#### Background

Domestic SAR operations are a critical service provided by DND to Canadian citizens. However, a major concern is the aging equipment that the air-force employs. FWSAR aircraft in Canada are becoming increasingly expensive to maintain, which endangers the lives of both pilots and civilians. Currently, the Department of National Defence (DND) employs a mixed fleet of FWSAR, the C-115 Buffalo that operates on the West Coast and the CC-130 Hercules in Central, Eastern and Arctic Canada. Both fixed-wing assets are planned to retire after decades of faithful service in conducting critical SAR operations from coast to coast in Canada, the Buffalo scheduled for 2015 and the Hercules for 2017. The CC-115 Buffalo, in service for 45 years, is

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<sup>62</sup> Jacques S. Gansler and William Lucyshyn, “Commercial-Off-The-Shelf (COTS): Doing it right,” Center for Public Policy and Private Enterprise, University of Maryland, September 2008, <http://www.dtic.mil/dtic/tr/fulltext/u2/a494143.pdf>

<sup>63</sup> Canada. Office of the Auditor General. *Report of the Auditor General to the House of Commons – Chapter 6: Acquisition of Military Helicopters*, [Ottawa], 2006. [http://www.oag-bvg.gc.ca/internet/english/parl\\_oag\\_201010\\_06\\_e\\_34289.html](http://www.oag-bvg.gc.ca/internet/english/parl_oag_201010_06_e_34289.html)

<sup>64</sup> Ibid.,

<sup>65</sup> Ibid.,

<sup>66</sup> Ibid.,

<sup>67</sup> Ibid.,



incredibly expensive to maintain as spare parts are difficult to obtain and approximately \$20 million dollars are spent per year to keep the Buffalo in operation.<sup>68</sup> Extensive maintenance of the Buffalo has adversely affected SAR operations. The Spring 2013 report by the Auditor General, indicated that in 2011, the Buffalo was unavailable for SAR “on 119 occasions and in five of these cases there were no SAR replacement airplanes to perform SAR missions.”<sup>69</sup> The Buffalo required a higher proportion of servicing hours for every hour of flight. This was a startling admission that pointed out SAR operations are in danger from inadequate equipment that urgently needs to be replaced. The Buffalo is being used beyond its intended life cycle.

Similar to the Buffalo, the entire fleet of CC-130(E and H models) Hercules are over 20 years old with mounting maintenance costs and difficulties to acquire spare parts. In comparison to modern SAR aircraft, the Hercules lack sensors and data management specialized for SAR missions.<sup>70</sup> Moreover, all of the CC-130E model Hercules, including ones used for SAR operations, have logged more than 40,000 flight hours.<sup>71</sup> The extraordinary number of flight hours combined with the rough usage that tactical airlift faces means that the Hercules airframes require urgent replacement. All thirteen Hercules can meet most operational requirements, however, two aircraft are always in rotated extended maintenance at any given time; the other 11 remaining Hercules are to perform SAR operations.<sup>72</sup> Major disasters that require additional Hercules for SAR operations would stretch aircrew and DND resources. As a result, the RCAF has a limited operational flexibility to maintain SAR missions due to continuous maintenance on the CC-130 airframes. In essence, a new FWSAR is desperately needed to replace the current aging fleet. Extending the current fleet of FWSAR beyond the current planned retirement of 2015 and 2017 would require significant upgrades to obsolete airframes. As I will explain, the FWSAR replacement procurement has been “fast-tracked” since 2004 with Paul Martin, but the process was stalled by the Conservative government in 2006.

### Challenges to the FWSAR Procurement

By 2004, the FWSAR project office proceeded to the definition phase with one website claiming that Alenia C-27J and the CASA Airbus Military were understood to be its lead candidates.<sup>73</sup> With the approval of the Treasury Board Secretariat to advance in the procurement

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<sup>68</sup> Canada. Office of the Auditor General, 2013 Spring Report of the Auditor General of Canada: Chapter 7 - Federal Search and Rescue Activities, [Ottawa], 2013, [http://www.oag-bvg.gc.ca/internet/English/parl\\_oag\\_201304\\_07\\_e\\_38192.html#hd5i](http://www.oag-bvg.gc.ca/internet/English/parl_oag_201304_07_e_38192.html#hd5i)

<sup>69</sup> Ibid.,

<sup>70</sup> Ibid.,

<sup>71</sup> Defence Industry Daily Staff, “Replacing Canada’s Failing CC-130s: 17-C130Js,” *Defence Industry Daily*, 18 May 2012, <http://www.defenseindustrydaily.com/canadas-cc130s-to-fail-in-3-years-4b-rfp-for-replacements-updated-01529/>

<sup>72</sup> Canada. Office of the Auditor General, 2013 Spring Report of the Auditor General of Canada: Chapter 7 - Federal Search and Rescue Activities, [Ottawa], 2013, [http://www.oag-bvg.gc.ca/internet/English/parl\\_oag\\_201304\\_07\\_e\\_38192.html#hd5i](http://www.oag-bvg.gc.ca/internet/English/parl_oag_201304_07_e_38192.html#hd5i)

<sup>73</sup> “A Canadian Forces Fixed-Wing Search and Rescue Project Timeline,” *Canadian American Strategic Review*, accessed 14 April 14, <http://www.casr.ca/id-fwsar-project-timeline.htm>

cycle and an allocated budget to the FWSAR project, the delivery of the aircraft was expected to begin “within 12 to 18 months – in 2006.”<sup>74</sup> With the minority Conservative government elected into office in 2006, the project took a hiatus and the office was dissolved to work on other projects that impacted operational requirements in Afghanistan.<sup>75</sup> In October of 2006, a Senate report named *Managing Turmoil* urged that the FWSAR procurement process be re-energized with 20 to 24 new FWSAR so that the aircraft could be delivered by 2007, as the process had been completely stalled by the Conservatives.<sup>76</sup> Near the end of 2006, Alan S. Williams (former ADM-Mat) admitted that the failure of fast-tracking the FWSAR project was due to the fact that DND “developed specifications which only allow one company to compete.”<sup>77</sup> Accusations surfaced that Air Force favoured the purchase of the C-27J Spartan and the SOR was written to exclude other options. With the politicization of the FWSAR purchase, it was understood that the process had to be re-evaluated. This accusation was solidified through a report made by the *Globe and Mail* in 2007; Daniel Leblanc wrote that a DND document “confirmed that only one aircraft [C-27J] [was] being considered as a ‘viable bidder’ for the search-and-rescue contract.”<sup>78</sup>

By 2010, with accusations still surfacing that the Government of Canada intended to sole source the C-27J, the National Research Council (NRC) was asked to examine the SOR and audit the report. The NRC criticized the SOR as overly technical and used to eliminate suitable competition for the FWSAR project. With this in mind, the SOR was once again revised and in 2011, Minister Peter MacKay announced that the FWSAR was still a top priority. In the spring of 2013, the Auditor General’s performance report criticized DND for not sufficiently replacing and maintaining “SAR aircraft at the level necessary to respond to SAR incidents effectively.”<sup>79</sup>

### Ill-defined Requirements

The NRC panel, composed of respected senior pilots with years of SAR experience, criticized that the SOR was overly-constrained and “may limit the potential number of solutions industry could propose.”<sup>80</sup> Analysts from the NRC recognized that the SOR was overly technical and complex. The principal recommendation for the SOR was that it should focus on a

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<sup>74</sup> Peter Pigott, “The Sorry Saga of FWSAR,” *FrontLine Defense*, Issue 2 2013, [http://www.frontline-defence.com/Defence/index\\_archives.php?page=2067](http://www.frontline-defence.com/Defence/index_archives.php?page=2067)

<sup>75</sup> “A Canadian Forces Fixed-Wing Search and Rescue Project Timeline,” *Canadian American Strategic Review*

<sup>76</sup> Canada. Standing Senate Committee on National Defence, *Managing Turmoil: The Need to Upgrade Canadian Foreign Aid and Military Strength to Deal with Massive Change*, [Ottawa], 2006, <http://www.parl.gc.ca/Content/SEN/Committee/391/defe/rep/repoct06-e.pdf>

<sup>77</sup> Peter Pigott, “The Sorry Saga of FWSAR,”

<sup>78</sup> Daniel Leblanc, “DND pushes quick plane deal,” *The Globe and Mail*, 03 April 2009, <http://www.theglobeandmail.com/news/national/dnd-pushes-quick-plane-deal/article1077452/>

<sup>79</sup> Canada. Office of the Auditor General, 2013 Spring Report of the Auditor General of Canada: Chapter 7 - Federal Search and Rescue Activities, [Ottawa], 2013, [http://www.oag-bvg.gc.ca/internet/English/parl\\_oag\\_201304\\_07\\_e\\_38192.html#hd5i](http://www.oag-bvg.gc.ca/internet/English/parl_oag_201304_07_e_38192.html#hd5i)

<sup>80</sup> *Ibid.*,

capability-based approach over technical specifications.<sup>81</sup> In other words, the SOR should be written in terms of performance and focus on intended results – bringing a SAR service to Canadians. Mandatory requirements should reflect the “nature of service to be delivered and the timely delivery of this service.”<sup>82</sup> This would incentivize creativity and increase open competition for a FWSAR between companies. Flexibility for industry to meet the recommendations in performance rated requirements would allow a wider selection of cost-effective choices.

The existing high level mandatory capabilities that are performance requirements notably range and response time in the SOR are not supported by analysis. These two requirements in actuality were constraints imposed on the FWSAR and consequently limited open competition, driving the SOR into a single compliant vendor. For instance, the mandatory range requirement is stated at 1699 nautical miles and represents a worst-case scenario. However, according to a research done by Bourdon and Rempel, a majority of SAR incidents are within 800 nm.<sup>83</sup> Secondly, the SOR determined the minimum speed requirement as 273 knots based on different scenarios and historical data. Cruise speed was the largest discriminating factor in the report. However, the NRC report concluded that there was insufficient evidence as to why 273 knots was chosen as a requirement. The SOR and the operational research paper did not address the calculated cruise speeds; in fact, the NRC had found it “difficult to defend this speed as a mandatory minimum requirement.”<sup>84</sup> This was based on the fact that the project did not have clear or well-defined objectives, as will be discussed further on in this study.

A technical example that was overly complex is point 11 by the NRC under Manoeuvrability. The SOR states that the FWSAR aircraft will be, “capable of safely and effectively conducting all current search and rescue manoeuvres conducted by the CC-115 Buffalo and the CC-130 Hercules, as specified in the FWSAR SOI, so as to ensure the same or better SAR level of service. In the event of a critical engine failure while searching in confined mountainous terrain (airspeed between 110 and 140 KIAS as per Annex A para 2.4.1.20) and at an altitude of 5,000 feet Mean Sea Level (MSL), must be capable of safely reversing course by executing a level, 45-degree bank, and constant energy turn through 180 degrees of heading change.”<sup>85</sup> As the NRC notes, DND values the capability of conducting SAR operations in mountainous area in a safe manner. This indicates that DND wanted a single FWSAR fleet to replace both the CC-115 Buffalo and the CC-130 Hercules, by merging specifications and the previous FWSAR aircraft’s performance standards. This closely resembles the Chinook case that merged the capability of different variants into a single air-frame.

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<sup>81</sup> Canada. National Research Council Canada. *Review of the Statement of Operational Requirements for the Fixed Wing Search and Rescue Aircraft – FINAL Report*. [Ottawa], 2010,

[http://www.forces.gc.ca/assets/FORCES\\_Internet/docs/en/about-reports-pubs/FWSAR\\_EN.pdf](http://www.forces.gc.ca/assets/FORCES_Internet/docs/en/about-reports-pubs/FWSAR_EN.pdf)

<sup>82</sup> Ibid.,

<sup>83</sup> Ibid.,

<sup>84</sup> Ibid.,

<sup>85</sup> Ibid.,

## Lack of SAR Policy

Another underlying issue with the SOR was the lack of an over-arching SAR policy to guide the FWSAR procurement. The NRC criticized that the FWSAR project was based on current capabilities and projections to maintain SAR coverage; however, that level of SAR operational requirements is not defined in Government of Canada policy.<sup>86</sup> The NRC emphasized that a FWSAR based on current capabilities would limit enhancements and inconsistently apply requirements. For instance, advances in search radar and electro-optical sensors are not mentioned and the SOR does not require the “FWSAR be capable of operating in icy conditions, from gravel runways or from austere airfields.”<sup>87</sup> Finally, the level of service of SAR coverage should not be written on existing FWSAR fleets and “ideally backed by government policy.”<sup>88</sup>

The 2013 Spring Report from the Auditor General also emphasized the lack of SAR policy and performance measurements. There is a serious policy gap within the Canadian Forces and the Canadian Coast Guard to address “policy principles, common priorities, service requirements, and standards.”<sup>89</sup> The level of service provided by the current FWSAR fleet is based on availability and capabilities rather than needs analysis.<sup>90</sup> The mandatory level of service and capabilities requirements within the SOR was based on ad-hoc information. Buying a FWSAR based on current projections would in fact serve to limit potential improvements on Canadian SAR operations. Having a performance measurement to articulate SAR coverage and operational requirements would serve to strengthen a FWSAR procurement decision. Without performance measurement targets, it is difficult for federal departments to measure and report on SAR response, activities and their performance.<sup>91</sup> This has been reflected in the SOR, without sufficient justification, which stipulated mandatory speed and range requirements that limited aircraft options. The NRC recommended articulating a level of service for SAR in terms of response time and coverage.<sup>92</sup> Such policy would be based on historical data to ensure a proper FWSAR choice that is efficient and capable of meeting Canadian SAR missions. The absence of SAR policy has filtrated into procurement decisions and planners; at issue is the absence of a performance measurement framework to guide and improve SAR coverage.<sup>93</sup>

## Off the Shelf Solution

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<sup>86</sup> Ibid.,

<sup>87</sup> Ibid.,

<sup>88</sup> Ibid.,

<sup>89</sup> Ibid.,

<sup>89</sup> Ibid.,

<sup>90</sup> Ibid.,

<sup>91</sup> Ibid.,

<sup>92</sup> Canada. Standing Committee on National Defence. 3<sup>rd</sup> sess. 40<sup>th</sup> Parliament. 2011. Committee Report 048. <http://www.parl.gc.ca/content/hoc/Committee/403/NDDN/Evidence/EV4959360/NDDNEV48-E.PDF>

<sup>93</sup> Canada. National Research Council Canada. *Review of the Statement of Operational Requirements for the Fixed Wing Search and Rescue Aircraft – FINAL Report*. [Ottawa], 2010, [http://www.forces.gc.ca/assets/FORCES\\_Internet/docs/en/about-reports-pubs/FWSAR\\_EN.pdf](http://www.forces.gc.ca/assets/FORCES_Internet/docs/en/about-reports-pubs/FWSAR_EN.pdf)

The FWSAR project emphasized an OTS solution that maximizes SAR capability and interoperability with existing CF inventory to minimize developmental costs and risks. Without clear guidelines, the NRC cautioned against using the term “off the shelf” unless DND anticipates the procured item will have minimal changes to the air-frame.<sup>94</sup> The SOR did not define OTS, nor are there policy guidelines with modifying platforms. As Hobson asks, “what is the limit on the amount of Canadianization allowed?”<sup>95</sup> The audit predicted that the time and effort to minimize modifications is invalid and planners following this assumption “may have significant impacts on both budget and delivery schedule.”<sup>96</sup>

As the analysis by NRC suggested, the intent of DND was to leverage an existing certification using a process known as Type Design Examination.<sup>97</sup> This meant that the SOR anticipated the basic aircraft would undergo modifications. The NRC stated that each modification will need certifications; they question how the extent of the modifications will meet the definition that DND placed on “off the shelf.”<sup>98</sup> As the CH-149 procurement indicated, there was a wide gap in terms of effort that can exist between “acquiring an airframe and certifying it for the intended purpose.”<sup>99</sup>

### Project Oversight

In an audit conducted by the CRS, the team discovered that project oversight and management was lacking. One of the principal recommendations was to improve project oversight and documentation to ensure the project complied with PAG. Like the Chinook procurement, the SRB did not convene annually to ensure proper project management. At the initial start of the project, the SRB was not convened between December 18, 2003 and June 30, 2006.<sup>100</sup> This would contradict with the PAG that stated a SRB review would conduct general project performance annually.<sup>101</sup>

## **CC-177 Globe Master**

### Background

In the early 2000s, DND policy emphasized the need for Canada to develop a strategic airlift capability to ferry soldiers and supplies over a long distance. This would coincide with the

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<sup>94</sup> Ibid.,

<sup>95</sup> Sharon Hobson, “Helicopter Procurement: Open Process Needed,” *FrontLine Defense Magazine*, 2009, [http://www.frontline-defence.com/index\\_archives.php?page=122](http://www.frontline-defence.com/index_archives.php?page=122)

<sup>96</sup> Canada. National Research Council Canada. *Review of the Statement of Operational Requirements for the Fixed Wing Search and Rescue Aircraft – FINAL Report*. [Ottawa], 2010, [http://www.forces.gc.ca/assets/FORCES\\_Internet/docs/en/about-reports-pubs/FWSAR\\_EN.pdf](http://www.forces.gc.ca/assets/FORCES_Internet/docs/en/about-reports-pubs/FWSAR_EN.pdf)

<sup>97</sup> Ibid.,

<sup>98</sup> Ibid.,

<sup>99</sup> Ibid.,

<sup>100</sup> Canada. Chief Review Services. *Audit of the Fixed Wing Search and Rescue (FWSAR) Project*, [Ottawa], 2009, <http://www.crs-csex.forces.gc.ca/reports-rapports/pdf/2009/142P0849-eng.pdf>

<sup>101</sup> Ibid.,

Liberal government's International policy statement in 2005, *A Role of Pride and Influence in the World: Defence*, outlining that the CF "will acquire, or ensure access to, the right mix of capabilities to meet the increasing requirements for domestic, global [strategic] and in-theatre [tactical] aircraft."<sup>102</sup> Before acquiring the C-17s, Canada's strategic airlift consisted of the CC-150 Polaris, a converted airliner. Peter Pigott, a prolific writer on Canadian Defence issues, noted that the Polaris had limited capabilities and could only land on airport runways, while the C-17 could take off on short run-ways and land on small strips of dirt.<sup>103</sup> The Department of National Defence also relied on chartering or leasing aircraft to deliver equipment and supplies into a theatre of operations and this was exemplified through the leasing of AN-124s from the Russian-Ukrainian company Volga-Dneper during the early days of Afghanistan.<sup>104</sup>

Similar to the Chinook situation, relying on allies for strategic transportation proved to be problematic with limited aircraft and resources. Participation in disaster relief and in humanitarian operations would be limited for the CF. As one author noted, "it is unlikely that Canada would be able to have guaranteed access to [strategic airlift] whenever the need arose, given the present shortfall in strategic airlift capacity of the United States Air Force (USAF)."<sup>105</sup> The reliance on allies and sharing strategic airlift capabilities was deemed unacceptable by DND and investigated into aircraft options to fulfill the capability gap.

It was in 2006 with the arrival of Stephen Harper's minority government and his promise to infuse capital and vigour into the defence establishment that saw the procurement of the C-17s. As part of Harper's campaign platform, the Conservatives introduced a large mobility and logistical package to revitalize the military. The \$17.1 billion dollar procurement package included Chinooks, tactical transportation aircraft, Joint Support Ships, and the strategic airlift program. The Conservatives argued that C-17s were critical for the uncertain and changing geopolitical environment; thus, the Canadian military would need its "own reliable and independent access to strategic airlift" to deliver equipment over long distances.<sup>106</sup> However, given the expensive nature of the C-17s, the Conservative government only invested and procured four aircraft. Internal DND documents stated that a minimum of five to six were needed to fulfill the strategic airlift gap.<sup>107</sup>

In early July of 2006, the Conservatives proceeded with the C-17 purchase through an Advanced Contracts Award Notice (ACAN) to procure four C-17 GlobeMaster III strategic

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<sup>102</sup> Peter Whelan, "Strategic Lift Capacity for Canada," *Ploughshares*, Summer 2005, Volume 26 Issue 2, [http://ploughshares.ca/pl\\_publications/strategic-lift-capacity-for-canada/](http://ploughshares.ca/pl_publications/strategic-lift-capacity-for-canada/)

<sup>103</sup> Peter Igott, "Airlift Contenders: C17, C130J or A400M?" *FrontLine Defence*, 2005, Volume 2, Issue 3, [http://www.frontline-defence.com/index\\_archives.php?page=1911](http://www.frontline-defence.com/index_archives.php?page=1911)

<sup>104</sup> *Ibid.*,

<sup>105</sup> Peter Whelan, "Strategic Lift Capacity for Canada,"

<sup>106</sup> Martin Shadwick, "How much Strategic Airlift is enough?" *Canadian Military Journal*, accessed 14 April 14, <http://www.journal.dnd.ca/vol13/no3/page76-eng.asp>

<sup>107</sup> *Ibid.*,

transport aircraft (later designated the CC-177) from Boeing.<sup>108</sup> Moreover, the C-17 procurement invoked the National Security Exception that excluded the project from treaty obligations, such as the AIT and the need for a competitive process.<sup>109</sup> However, the ACAN did allow potential competitors to challenge Boeing for the strategic airlift project. If the company satisfied the requirements that DND set out, the process would revert back to the normal tendering process. Two companies did challenge for the strategic airlift project, but the platforms failed to meet the mandatory requirements listed in the ACAN.<sup>110</sup> On February 1 of 2007, Canada and Boeing signed a contract for the direct sale of four C-17s with the first aircraft delivered at the beginning of August in the same year.<sup>111</sup> Within the same month, the CC-177 flew its first operational mission delivering critical humanitarian aid to Jamaica in the wake of Hurricane Dean.<sup>112</sup> Showcasing the importance of strategic airlift, the C-17 was chosen to conduct the mission over the C-130, because of its larger carrying capacity and range. Immediately after, on August 30<sup>th</sup> 2007, the same CC-177 delivered strategic supplies in Kandahar, Afghanistan. Canada took its fourth and last aircraft in April 2008, only fourteen months after signing a deal with Boeing.<sup>113</sup> The quick procurement was touted as a success by DND.<sup>114</sup> The C-17 was quickly delivered within the same year and deployed immediately to conduct humanitarian operations and strategic resupply. What were the factors that enabled for timely delivery of C-17s?

### Requirements

The requirements for the strategic airlift procurement were simple and limited. The SOR included:

- Sufficient unfuelled range & payload (6,482 km/3500 nm with 39,000 kg/85,980 lbs) to support domestic and internationally deployed operations;
- Shall be capable of supporting Canadian Forces domestic and global operations, in areas that may pose a threat to transport aircraft. To provide the required flexibility in a theatre of operations, capable [of] take off and land unpaved short runways (4000 ft x 90 ft or 1219m x 27.4m) and airdrop of personnel and/or equipment;
- Shall have adequate cargo compartment size to transport NATO standard pallet-ized equipment (88 in x 108 in / 2.235 m x 2.743 m ), CF Helicopter assets that are in the

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<sup>108</sup> “Canadian Forces Strategic Airlift – MERX C-17 ACAN Notice,” *Canadian American Strategic Review*, August 2006, <http://www.casr.ca/doc-acan-c17.htm>

<sup>109</sup> “National Security Exemptions,” Chapter 3 – Supply Manual, Public Works and Government Services Canada, accessed 14 April 14, <https://buyandsell.gc.ca/policy-and-guidelines/supply-manual/section/3/105>

<sup>110</sup> “Canadian Forces Strategic Airlift – MERX C-17 ACAN Notice,” *Canadian American Strategic Review*,

<sup>111</sup> Defence Industry Daily Staff, “Canada Joining the Anglosphere C-17 Club with CC-177,” *Defence Industry Daily*, 17 Nov 2008, <http://www.defenseindustrydaily.com/canada-joining-the-anglosphere-c17-club-02388/>

<sup>112</sup> *Ibid.*,

<sup>113</sup> Matthew Fisher, “Canada’s air force boost its heavy lift capacity into Afghanistan,” *Canwest News Service*, 9 April 2008, <http://www.nationalpost.com/news/story.html?id=433719>

<sup>114</sup> David Pugliese, “Everything’s shipshape when it comes to military procurement, Defence Department says,” *Ottawa Citizen*, 4 April 2014, <https://o.canada.com/news/national/everythings-shipshape-when-it-comes-to-military-procurement-defence-department-says/>

current CF inventory, and wheeled equipment in a combat ready configuration. The aircraft must have the ability to load and unload palletized cargo at austere operating locations without the use of specialized loading equipment;

- Shall be certified to aviation certification standards recognized by Canada by the contract award date [ie: Transport Canada, US FAA, or European JAA rules]; and
- Shall be delivered as soon as possible but the first aircraft no later than 18 months after contract award and the last within 48 months of contract award.<sup>115</sup>

The SOR was a move away from technical requirements that would otherwise constrain the procurement. Instead of specifying how the equipment will perform, the requirements structured around a purpose and outcome desired – a hallmark of performance-based acquisition (PBA).<sup>116</sup> As Dan Ross commented during a House of Commons meeting, the SOR was a simple and performance-based contract in terms of payload, range, and manoeuvrability with an off the shelf proven solution.<sup>117</sup> The SOR focused on end results with measurable and clear definitions, based on defense policy. This is highlighted by setting clear fuel, payload and range objectives that could be assessed to ensure a viable contender.

The PBA approach also made sense for DND with an understaffed procurement team that had limited technical experience and engineers. Program review slashed their procurement personnel strength by 54% and until only recently has DND started to rebuild its procurement management expertise again.<sup>118</sup> Dan Ross, ADM (Mat) during the C-17 procurement, noted that the shift of moving from technical specifications into performance requirements was a cultural change with the large amount of engineers based in DND.<sup>119</sup> The emphasis was heavily focused on writing technical and engineering specifications. However, with OTS procurements, there has to be a move towards performance standards.<sup>120</sup> With OTS platforms and operationally required procurements, it reduces time and cost to use performance standards and allows industry to propose existing solutions. Modifying existing solutions drives up schedule delays and developmental costs; this was highlighted by the Chinook case and what the NRC predicted would happen in the FWSAR procurement.

### Clear Project Goals

In the case of the C-17 procurement, there was a clear and definable project and capability deficiency that had to be met. Requirements were based on clear project goals and

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<sup>115</sup> “Canadian Forces Strategic Airlift – MERX C-17 ACAN Notice,” *Canadian American Strategic Review*,

<sup>116</sup> Kevin McGuinness, “Performance Based Acquisition,” Summit, Nov/Dec 2010,

[http://www.summitconnects.com/Articles\\_Columnns/PDF\\_Documents/201012/Nov\\_Dec2010\\_vol13\\_i8\\_03.pdf](http://www.summitconnects.com/Articles_Columnns/PDF_Documents/201012/Nov_Dec2010_vol13_i8_03.pdf)

<sup>117</sup> Canada. Parliament. House of Commons. Standing Committee on Government Operations and Estimate. 2<sup>nd</sup> sess, 39<sup>th</sup> Parliament, 2008. Committee Report 033,

<http://www.parl.gc.ca/content/hoc/Committee/392/OGGO/Evidence/EV3553420/OGGOEV33-E.PDF>

<sup>118</sup> Ibid.,

<sup>119</sup> Ibid.,

<sup>120</sup> Ibid.,



objectives that DND identified. Michael Fortier, former Minister of Public Works and Government Services, said that the C-17 was a smart procurement and that DND “identified what it needed, and we were able to zero in on that aircraft once it was obvious there were no similar types of aircraft available for us to purchase.”<sup>121</sup> The procurement started with an extensive research in 2002 called the “Future Strategic Airlifter” project that identified solutions such as the IL-76.<sup>122</sup> In other words, the topic was studied extensively by military planners and they understood the strategic airlift capabilities that Canada required. As a result, DND could clearly articulate what Canada required in terms of range and payload with a clear and definable end result. This was exemplified during a House of Commons meeting with DND officials and Members of Parliament. Colonel Burt stated that the requirements were based on determining an adequate representative distance (Trenton to Ramstein) and a minimum acceptable representative load (Two combat-ready LAV III).<sup>123</sup> These performance standards were based on extensive consultations with the army and an intelligence assessment on future CF operations.<sup>124</sup> C-17 requirements were also based on exceeding the current capabilities of the tactical lift airlifter (CC-130 Hercules) and the current strategic airlifter (CC-150 Polaris).<sup>125</sup>

### Modifications

The C-17 was part of the Global Sustainment Program (GSP) that made Boeing responsible for providing consistent and reliable sustainment support/maintenance. Product support is managed through the GSP through a “long term performance-based partnership between Boeing and its C-17 customers.”<sup>126</sup> Boeing employees provide important technical and engineering support to the C-17s in service. Under the GSP, Canada paid for readiness and not just specific parts or services.<sup>127</sup> All support activities are supported through the GSP including supply chain management and all the technical aspects of in-service support to maintain the highest level of readiness. The GSP agreement provided a total platform sustainment across the U.S. Air force fleet and its international C-17 fleet; thus, there is complete interoperability of training, parts, maintenance and modifications across the entire C-17 fleet.<sup>128</sup> As a result, every C-17 across the world is part of a “virtual fleet.” Every aircraft across the globe is nearly

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<sup>121</sup> Canada. Parliament. House of Commons. Standing Committee on Government Operations and Estimate. 2<sup>nd</sup> sess, 39<sup>th</sup> Parliament, 2008. Committee Report 023,

<http://www.parl.gc.ca/content/hoc/Committee/392/OGGO/Evidence/EV3412493/OGGOEV23-E.PDF>

<sup>122</sup> Peter Whelan, “Strategic Lift Capacity for Canada,”

<sup>123</sup> Canada. Parliament. House of Commons. Standing Committee on National Defence. 1<sup>st</sup> sess., 39<sup>th</sup> Parliament, 2008. Committee Report 036,

<http://www.parl.gc.ca/content/hoc/Committee/391/NDDN/Evidence/EV2706636/NDDNEV36-E.PDF>

<sup>124</sup> Ibid.,

<sup>125</sup> Ibid.,

<sup>126</sup> Defence Industry Daily Staff, “The Global C-17 Sustainment Partnership,” *Defence Industry Daily*, 07 Jan 2013, <http://www.defenseindustrydaily.com/did-focus-the-c17-global-sustainment-partnership-02756/>

<sup>127</sup> Richard Bray, “Canadian Forces get a strategic lift,” *Vanguard Magazine*, May/June 2007, <http://vanguardcanada.com/canadian-forces-get-a-strategic-lift/>

<sup>128</sup> “C-17 Globemaster II Integrated Sustainment Program (GISP),” Boeing, accessed 14 April 14, [http://www.boeing.com/advertising/support/\\_lifecycle/C17GM\\_III\\_Integrated\\_Sustain\\_Prgm\\_Prod\\_Crd.pdf](http://www.boeing.com/advertising/support/_lifecycle/C17GM_III_Integrated_Sustain_Prgm_Prod_Crd.pdf)

identical or in the process of becoming identical and there is “no real difference between an American and foreign aircraft.”<sup>129</sup> Dan Ross pointed out that the only modification done to the C-17 was “[putting] a Canadian maple leaf on the tail.”<sup>130</sup> Modifications that took costly time to implement and certify did not exist in the C-17 procurement. As soon as the aircraft rolled off the assembly line, it was shipped to Trenton. This is indicated by the extremely short procurement of just over a year and by the fact that C-17’s were able to quickly conduct missions within the same month of arrival on the airbase.

## **CC-130J Hercules**

### Background

The C-130 Hercules has been the workhorse of the Canadian Air Force since the 1960s and performs roles such as tactical airlift, tactical air-to-air refuelling, and fixed-wing search and rescue.<sup>131</sup> The Hercules has been an ideal aircraft for the RCAF with its ruggedness and the ability to take off in challenging terrain and weather conditions.<sup>132</sup> However, starting in the 1990s, Canada’s older fleet of C-130 has faced serious problems, including issues with maintenance and procuring spare parts. Canada’s older Hercules (E and H model) fleet has logged more hours than any military fleet and has put significant strain on the airframes. It has become extremely costly to maintain and its continued use endangers soldiers that rely on the aircraft. As mentioned previously, the Conservatives promised a large investment in capabilities to move and logistically sustain troops. DND chose the C-130J manufactured by Lockheed Martin for its tactical aircraft requirements, citing interoperability and familiarity as major reasons.<sup>133</sup> In 2005 Chief of the Defence Staff Rick Hillier noted that: “Our [CC-130 E/H] Hercules fleet right now is rapidly going downhill. We know that three years and a little bit more than that, the fleet starts to become almost completely in-operational and we will have to stop supporting operations – or else, not be able to start them.”<sup>134</sup> In 2008, the purchase contract was signed with DND and Lockheed Martin with the first aircraft expected to be delivered in December of 2010 and the last aircraft in December of 2012. However, the first Hercules was actually delivered in June 2010, a full six month ahead of schedule and departed for its first mission in Kandahar airfield within the same year.<sup>135</sup> Peter McKay declared that the C-130J was

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<sup>129</sup> Richard Bray, “Canadian Forces get a strategic lift,”

<sup>130</sup> Canada. Parliament. House of Commons. Standing Committee on Government Operations and Estimate. 2<sup>nd</sup> sess, 39<sup>th</sup> Parliament, 2008. Committee Report 033,

<http://www.parl.gc.ca/content/hoc/Committee/392/OGGO/Evidence/EV3553420/OGGOEV33-E.PDF>

<sup>131</sup> “DND reaffirms C-130J In-Service Support,” *Canadian Defence Review*, 22 Mar 2010,

<http://www.canadiandefencereview.com/news.php/news/416>

<sup>132</sup> Ibid.,

<sup>133</sup> Defence Industry Daily Staff, “Replacing Canada’s Failing CC-130: 17 C-130Js,” *Defence Industry Daily*, 08 May 2012, <http://www.defenseindustrydaily.com/canadas-cc130s-to-fail-in-3-years-4b-rfp-for-replacements-updated-01529/#2006andEarlier>

<sup>134</sup> Ibid.,

<sup>135</sup> “New Hercs in Kandahar,” *FrontLine Defence*, Jan 2011, Volume 8 Number 1, [http://www.frontline-defence.com/Defence/index\\_archives.php?page=1584](http://www.frontline-defence.com/Defence/index_archives.php?page=1584)

a procurement “delivered on budget and ahead of schedule, [which] will serve Canada and Canadians well for years to come.”<sup>136</sup>

### Performance Contracting

The C-130J project employed a different method than the ACAN to procure the aircraft. DND issued a Solicitation of Interest and Qualification (SOIQ) procurement process, which identifies qualified bidders. The SOIQ process exhibits performance-contracting characteristics, similar to the C-17. This innovative approach has DND approach industry for a solution that fits DND requirements. DND invites potential suppliers to indicate their interest and demonstrate their ability to meet high level performance criteria that are set out in the SOR.<sup>137</sup> As DND noted, this was a performance-based contracting that still fostered a competitive process, but it also established a strong partnership between industry and the government.<sup>138</sup> The same process was applied to the National Shipbuilding Procurement Strategy (NSPS). The Auditor General in 2013 commented that the NSPS resulted in a “successful and efficient process independent of political influence, consistent with government regulations and policies, and carried out in an open and transparent manner.”<sup>139</sup> The SOIQ process led to extensive feedback and consultation with industry that added a level of credibility and efficiency. As Dan Ross relates:

We will go to industry and say that this is the performance we want in the operation centre of the radar picture, and by the way, make sure that it's a proven radar that's not developmental. And we'll let industry propose the best system of radar for that ship. It drives down your schedule. It drives down your technical risk. It drives down your costs. And you get good operational output.<sup>140</sup>

### Modifications

A second factor that led to a rapid procurement was the minimal modifications on the C-130J airframe. The C-130J had minimal customization to include secure satellite communications, extended service life wing used in U.S. special operations, and lower fuselage protection against rock damage on austere landing strips.<sup>141</sup> Lieutenant Colonel Keiver noted that the C-130J is not uniquely Canadian and the reason they were able to procure the plane immediately was because of the limited nature of its modifications.<sup>142</sup> The C-130J mirrors its

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<sup>136</sup> Ibid.,

<sup>137</sup> “Backgrounder – Tactical Airlift Project,” National Defence and the Canadian Armed Forces, 24 Nov 2005, <http://www.forces.gc.ca/en/news/article.page?doc=tactical-airlift-project/hnocfofe>

<sup>138</sup> Ibid.,

<sup>139</sup> Canada. Office of the Auditor General. *National Shipbuilding Procurement Strategy*, [Ottawa], 2013, [http://www.oag-bvg.gc.ca/internet/docs/parl\\_oag\\_201311\\_03\\_e.pdf](http://www.oag-bvg.gc.ca/internet/docs/parl_oag_201311_03_e.pdf)

<sup>140</sup> Canada. Parliament. House of Commons. Standing Committee on Government Operations and Estimate. 2<sup>nd</sup> sess, 39<sup>th</sup> Parliament, 2008. Committee Report 033,

<http://www.parl.gc.ca/content/hoc/Committee/392/OGGO/Evidence/EV3553420/OGGOEV33-E.PDF>

<sup>141</sup> “Canucks Unlimited,” Royal Canadian Air Force, 28 Feb 2012, <http://www.rcaf-arc.forces.gc.ca/en/article-template-standard.page?doc=canucks-unlimited/hn4a3dci>

<sup>142</sup> Ibid.,

American counter-part with only small changes that are unique to the Canadian environment. Modifications made on the C-130J by Lockheed Martin did not significantly alter the budget of the aircraft nor create delays to the production line, as indicated by an early delivery date by Lockheed Martin. Unlike the Chinook procurement, the C-130J was on budget and procured well within the defined schedule. This indicates that modifications were anticipated and presented to planners.

### Policy Recommendations

1) It is recommended that a procurement project begins with clear and well-defined objectives that align with defence policy.

As Pierre Laugeux, former assistant ADM Mat said before the Standing Committee on National Defence: “No acquisition should start without a clearly understood accepted statement of the capability deficiency.”<sup>143</sup> DND must have a clear and realistic vision on the end result and capability that is missing. A clear statement on purpose, scope, and mission must be developed by DND planners. This will help formulate an understanding of the exact requirements and measurable objectives that DND requires in operational situations, rather than an ad-hoc process to procure acquisitions. A clear vision would also help eliminate a “Statement of Requirements Creep.” This includes early industry engagement to help facilitate knowledge on existing off the shelf procurement products and their viability.

As previously outlined, problems developed when aircraft required extensive modifications to their current form; this is especially true in the case of the Chinook that increased developmental costs and delivery delays. Modifications were made without a solid understanding of what role the Chinook would play in Canada’s helicopter fleet until the very last moment during negotiations between Boeing and DND. Technical requirements had crept into the SOR, incorporating rated requirements into mandatory guidelines. For the FWSAR, the NRC noted that the procurement lacked an overall SAR policy to guide the procurement process. They suspect that significant modifications will be made that require recertification of the aircraft and subsequently question if the FWSAR will be an off the shelf solution. In other words, the FWSAR project would lack clear requirements. There needs to be performance measurements to strengthen the FWSAR project.

On the other hand, the C-17 and C-130J were well understood in terms of objectives and capability that DND needed to acquire. DND planners envisioned exactly the capability that the CF required in terms of strategic airlift and articulated basic principles in the procurement. The C-17 procurement project articulated clear end results and was in line with Canadian defence

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<sup>143</sup> Canada. Parliament. Standing Committee on National Defence. 2<sup>nd</sup> sess. 39<sup>th</sup> Parliament. 2008. [http://www.parl.gc.ca/content/hoc/Committee/392/NDDN/Reports/RP3240298/392\\_NDDN\\_Rpt02/392\\_NDDN\\_Rpt02-e.pdf](http://www.parl.gc.ca/content/hoc/Committee/392/NDDN/Reports/RP3240298/392_NDDN_Rpt02/392_NDDN_Rpt02-e.pdf)

policy and prediction of global affairs. As Lieutenant General Lucas points out, the type of equipment being moved across large distances will be LAVs. The representative distance from Trenton to Ramstein (Germany) highlighted that the CF predicted its future operations will heavily be based in Africa and Asia.<sup>144</sup> These clear objectives and principles translated into simple performance guidelines for the C-17 aircraft while the C-130J saw the need for replacement of the tactical fleet of airlifts.

2) It is recommended that DND investigate establishing guidelines for modifications in OTS procurements.

A problem existed with the Chinook procurement in that it loaded additional rated requirements on the project, further complicating the SOR. The original SOR had requirements that could be fulfilled by procuring a basic variant of the Chinook with the result of saving an extensive amount of time and costs to the project. As previously mentioned, DND officials treated rated requirements as mandatory guidelines, thus changing the SOR in the process. Hobson noted there were no limits for modifications.<sup>145</sup> Extensive modifications on OTS equipment turned procurement projects into a developmental platform with unproven capabilities and needed testing. This was certainly highlighted by the Chinook that required safety recertification due to the modification of the airframe. As the Canadian Association of Defence and Security Industries (CADSI) observes, OTS, whether it is Commercial OTS or Military OTS, is a misnomer, “because Canada always Canadianizes the requirement.”<sup>146</sup> Although subjective, a guideline or an examination on modifications must be drafted within the capital acquisition process. Having policies on limiting modifications in OTS acquisitions for DND planners would benefit OTS procurements in controlling costs and schedule delivery. This is not to say that no modifications should exist as the C-130J demonstrated that with simple modifications the aircraft was still delivered on time. This timely delivery is especially important in cases where operational emergencies arise in a domestic or international situation. The CF needed Chinooks to conduct resupply missions and aging FWSAR aircraft are endangering SAR operations.

3) It is recommended that DND pursues performance objectives in OTS procurements.

As indicated above, simple performance-based acquisition for OTS minimizes time and costs. The CRS noted that the “SOR written to replace the aging Hercules fleet was limited to a one-page statement of performance requirements with subsequent time savings.”<sup>147</sup> The C-17

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<sup>144</sup> Canada. Parliament. Standing Committee on National Defence. 1<sup>st</sup> sess., 39<sup>th</sup> Parliament. 2007. Committee Report 036, <http://www.parl.gc.ca/content/hoc/Committee/391/NDDN/Evidence/EV2706636/NDDNEV36-E.PDF>

<sup>145</sup> Sharon Hobson, “Helicopter Procurement: Open Process Needed,”

<sup>146</sup> CADSI, “Improving Canadian Defence Procurement: Feedback from Industry Consultations on the Opportunities and Challenges facing the Defence Industry and Military Procurement,” November 2009, <https://www.defenceandsecurity.ca/UserFiles/File/IE/Annex%20E%20-%20Consultation%20Summary.pdf>

<sup>147</sup> Canada. National Defence. Chief Review Services. *Perspectives on the Capital Equipment Acquisition Process*. [Ottawa], 2006, <http://www.crs-csex.forces.gc.ca/reports-rapports/pdf/2006/P0757-eng.pdf>

strategic airlift procurement also saw a time savings SOR based on simple performance-based objectives. From the 1990s, the U.S. Department of Defence has shifted to utilize performance-based specifications when acquiring weapon systems. PBA in OTS acquisition is the preferred method, as it allows innovative solutions by industry and fosters competition. Mandating technical specifications in OTS procurement resulted in modifying a platform to fulfill a role required by DND. This can be disconcerting, as the platform may be unsuitable for specific operations, or else DND requirements are entirely unfeasible. Rather, a PBA process will increase the likelihood of meeting mission needs by focusing on an outcome oriented process.<sup>148</sup> PBA also simplifies the process of writing specifications; it is far easier to write and describe a need that has to be met than specifying a method.<sup>149</sup>

CADSI, in their seminal report on defence procurement, also critiqued the requirements process; they stated that “requirements are defined in an overly prescriptive manner with too many mandatories, leading to failed procurements, companies not bidding, and program delays.”<sup>150</sup> Instead, CADSI recommended limiting mandatory requirements to encourage solutions from industry. More importantly, CADSI, with consultation from industry, recommended defining the requirements based on outcomes, rather than outputs.<sup>151</sup> In other words, simple performance-based outcomes should be the focus in acquiring OTS solutions.

In contrast, the Chinook and the FWSAR procurement were focused on technical specifications. In the case of the Chinook, the creation of two different variants created delays in the procurement project. Technical and rated requirements were loaded onto the Chinook that morphed the project into a “multi-mission” capable helicopter. While notable, the original purpose for the procurement of the Chinook was simply transporting soldiers and equipment in Afghanistan – a capability sorely needed for soldiers stationed in Kandahar. Dan Ross commented that in the past, writing technical specification resulted in a “Frankenstein solution that no one had ever built.”<sup>152</sup> In the same capacity, the FWSAR project was overloaded with unverifiable and unsupported requirements, delaying the process.

4) It is recommended that procurement projects are appropriately staffed with well-trained and knowledgeable project managers and personnel.

As former ADM-Mat Pierre Lagueux has indicated, the process should employ experienced teams to facilitate better acquisition and ensure proper procedures are followed.<sup>153</sup>

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<sup>148</sup> Kevin McGuinness, “Performance Based Acquisition,”

<sup>149</sup> Ibid.,

<sup>150</sup> CADSI, “Canada’s Defence Industry: A Vital Partner Supporting Canada’s Economic and National Interests - Industry Engagement on the Opportunities and Challenges Facing the Defence Industry and Military Procurement,” Dec 2009,

[https://www.defenceandsecurity.ca/UserFiles/File/IE/Military\\_Procurement\\_Main\\_Report\\_March\\_09\\_2010.pdf](https://www.defenceandsecurity.ca/UserFiles/File/IE/Military_Procurement_Main_Report_March_09_2010.pdf)

<sup>151</sup> Ibid.,

<sup>152</sup> Canada. Parliament. Standing Committee on National Defence. 3<sup>rd</sup> sess., 40<sup>th</sup> Parliament, 2010, Committee Report 010, <http://www.parl.gc.ca/content/hoc/Committee/403/NDDN/Evidence/EV4408688/NDDNEV07-E.PDF>

<sup>153</sup> CADSI, “Canada’s Defence Industry: A Vital Partner Supporting Canada’s Economic and National Interests,”

As I previously indicated, procurement personnel strength was drastically cut during the 1990s and only recently has DND begun to rebuild the lost expertise in procurement management. As Phillip Lagasse commented, the rash of “specification-creep” was a result of overburdened and inexperienced project managers that were unaware to what degree the modifications had on a project.<sup>154</sup> Moreover, the flux of procurement projects without an increase in experienced staff resulted in undermining proper project management.<sup>155</sup> Industry has expressed concerns over DND staff evaluating requirements; DND staff may not have the training and experience to do an effective job.<sup>156</sup> This is certainly highlighted by Vice Admiral Buck’s statement that criticized requirements as being an unrealistic “wish-list” for DND planners. As a result, what emerges is a highly impractical platform overloaded with requirements and impossible to procure without extensively adding developmental cost and time. One solution proposed by the CRS is to have a specialized group focused on writing performance-based SORs, which would save time and costs.<sup>157</sup>

5) It is recommended that DND investigate ways of ensuring project management guidelines are followed in sole-source procurements.

Possibly owing to overburdened procurement staff, a number of critical steps during the capital acquisition process were neglected. Within both the Chinook and FWSAR procurement, a number of important committees did not convene to ensure proper management and project control. As a result, both projects were over-specified and loaded with additional and, at times, impractical requirements. The Chinook failed to meet schedule deliveries, one of its mandatory requirements. On the other hand, the FWSAR project faces a direr situation with the project restarting multiple times and without a RFP – even though the project was “fast-tracked.” Although it is acknowledged that the circumstances called for speedy acquisition and immediate procurement, project management and guidelines are still required to be followed. This is especially important at the front end of the acquisition cycle to cut down time and costs.

## Conclusion

Problems existed during OTS and sole-sourced procurements. The most extreme examples can be found in the Chinook and the FWSAR, where overly complicated technical requirements were drafted into the SOR. As a result, extensive modifications were added onto the project or the SOR had to be rewritten - destroying years of work. Factors such as unclear project definitions and improper project management played a large role in delaying the

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<sup>154</sup> Philippe Lagasse, “Recapitalizing the Canadian Forces’ Major Fleets: Assessing Lingered Controversies and Challenges,” CDFAI, Dec 2012,

<http://www.cdfai.org/PDF/Recapitalizing%20the%20Canadian%20Forces%20Major%20Fleets.pdf>

<sup>155</sup> Ibid.,

<sup>156</sup> CADSI, “Improving Canadian Defence Procurement: Feedback from Industry Consultations on the Opportunities and Challenges facing the Defence Industry and Military Procurement,”

<sup>157</sup> Canada. National Defence. Chief Review Services. *Perspectives on the Capital Equipment Acquisition Process*. [Ottawa], 2006, <http://www.crs-csex.forces.gc.ca/reports-rapports/pdf/2006/P0757-eng.pdf>

procurement process. Instead, as industry experts and academics have concluded, OTS procurements should adopt performance-based processes and requirements. PBA allows industry to provide innovative solutions and strengthened partnership through successful procurements. This is modelled by the C-17 and C-130J procurement that offered simple, measurable, and performance-based requirements. Both the strategic and tactical airlift projects were quickly delivered with limited modifications on schedule and on budget. They were deployed immediately to fulfill urgent ongoing operations. Meanwhile, the Chinook will finish its delivery in 2014 without fulfilling its original purpose in supporting the ISAF mission and the search for a FWSAR is still ongoing.



## Appendix A

### **AIT 506: Procedures for Procurement**

1. Each Party shall ensure that procurement covered by this Chapter is conducted in accordance with the procedures set out in this Article.
2. A call for tenders shall be made through one or more of the following methods:
  - a. the use of an electronic tendering system that is equally accessible to all Canadian suppliers;
  - b. publication in one or more predetermined daily newspapers that are easily accessible to all Canadian suppliers; or
  - c. the use of source lists, provided that, in respect of any source list:
    - i. registration on the source list is consistent with Article 504;
    - ii. all registered suppliers in a given category are invited to respond to all calls for tenders in that category; and
    - iii. a supplier that meets the conditions for registration on the source list is able to register at any time.
3. Each Party shall, no later than January 1, 1995, designate the electronic tendering system or predetermined daily newspapers referred to in paragraphs 2(a) and (b) that it will use when making its calls for tenders. If a Party decides to change the system or a newspaper so designated, it shall notify the other Parties at least 30 days prior to implementing the change.
4. A notice of a call for tenders shall contain at least the following information:
  - a. a brief description of the procurement contemplated;
  - b. the place where a person may obtain information and tender documents;
  - c. the conditions for obtaining the tender documents;
  - d. the place where the tenders are to be sent;
  - e. the date and time limit for submitting tenders;
  - f. the time and place of the opening of the tenders in the event of a public opening; and
  - g. a statement that the procurement is subject to this Chapter.
5. Each Party shall provide suppliers with a reasonable period of time to submit a bid, taking into account the time needed to disseminate the information and the complexity of the procurement.
6. In evaluating tenders, a Party may take into account not only the submitted price but also quality, quantity, delivery, servicing, the capacity of the supplier to meet the requirements of the procurement and any other criteria directly related to the procurement that are consistent with Article 504. The tender documents shall clearly identify the requirements of the procurement, the criteria that will be used in the evaluation of bids and the methods of weighting and evaluating the criteria.
7. An entity may limit tenders to goods, services or suppliers qualified prior to the close of call for tenders. However, the qualification process must itself be consistent with Article 504. An invitation to qualify shall be published at least annually by a method referred to in paragraph 2(a) or (b) or shall be distributed to suppliers listed on a source list referred to in paragraph 2(c).

8. An entity may limit a contract award to goods, services or suppliers that have been assessed (for example, certified, evaluated, qualified, registered or verified) by an independent nationally-recognized and industry-supported organization such as the Standards Council of Canada.
9. If a procurement exempted from the obligations of this Chapter under paragraph 11 or 12 or Article 507 or 508 is publicly tendered in a daily newspaper or on an electronic tendering system, the tender notice shall indicate the restrictions and highlight the practices that do not conform with this Article or Article 504.
10. An entity that uses a source list shall:
  - a. include information in its policies, procedures and practices describing the circumstances and manner in which the source list is used and any qualification criteria that a supplier must meet in order to register on the source list;
  - b. provide written confirmation of registration to any supplier that requests registration on the source list or indicate the qualification criteria that were not met; and
  - c. on request by any Party, provide that Party with the tender notice and the list of suppliers that will be invited to bid on a specific tender.
11. An entity of a Party may use procurement procedures that are different from those described in paragraphs 1 through 10 in the following circumstances, provided that it does not do so for the purpose of avoiding competition between suppliers or in order to discriminate against suppliers of any other Party:
  - a. where an unforeseeable situation of urgency exists and the goods, services or construction cannot be obtained in time by means of open procurement procedures;
  - b. where goods or consulting services regarding matters of a confidential or privileged nature are to be purchased and the disclosure of those matters through an open tendering process could reasonably be expected to compromise government confidentiality, cause economic disruption or otherwise be contrary to the public interest;
  - c. where a contract is to be awarded under a cooperation agreement that is financed, in whole or in part, by an international cooperation organization, only to the extent that the agreement between the Party and the organization includes rules for awarding contracts that differ from the obligations set out in this Chapter;
  - d. where construction materials are to be purchased and it can be demonstrated that transportation costs and technical considerations impose geographic limits on the available supply base, specifically in the case of sand, stone, gravel, asphalt, compound and pre-mixed concrete for use in the construction or repair of roads;
  - e. where compliance with the open tendering provisions set out in this Chapter would interfere with a Party's ability to maintain security or order or to protect human, animal or plant life or health; and
  - f. in the absence of a receipt of any bids in response to a call for tenders made in accordance with the procedures set out in this Chapter.
12. Where only one supplier is able to meet the requirements of a procurement, an entity may use procurement procedures that are different from those described in paragraphs 1 through 10 in the following circumstances:

- a. to ensure compatibility with existing products, to recognize exclusive rights, such as exclusive licences, copyright and patent rights, or to maintain specialized products that must be maintained by the manufacturer or its representative;
- b. where there is an absence of competition for technical reasons and the goods or services can be supplied only by a particular supplier and no alternative or substitute exists;
- c. or the procurement of goods or services the supply of which is controlled by a supplier that is a statutory monopoly;
- d. the purchase of goods on a commodity market;
- e. or work to be performed on or about a leased building or portions thereof that may be performed only by the lessor;
- f. for work to be performed on property by a contractor according to provisions of a warranty or guarantee held in respect of the property or the original work;
- g. for a contract to be awarded to the winner of a design contest;
- h. for the procurement of a prototype or a first good or service to be developed in the course of and for a particular contract for research, experiment, study or original development, but not for any subsequent purchases;
- i. for the purchase of goods under exceptionally advantageous circumstances such as bankruptcy or receivership, but not for routine purchases;
- j. for the procurement of original works of art;
- k. for the procurement of subscriptions to newspapers, magazines or other periodicals; and
- l. for the procurement of real property.

## Appendix B

### **National Security Clause / Article 1804**

Nothing in this Agreement shall be construed to:

- a. require the Federal Government to provide, or allow access to, information the disclosure of which it determines to be contrary to national security; or
- b. prevent the Federal Government from taking any action that it considers necessary to protect national security interests or, pursuant to its international obligations, for the maintenance of international peace and security.

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