
The Politics of Procurement

Aaron Plamondon

The Politics of Procurement
Military Acquisition in Canada
and the *Sea King* Helicopter



UBCPress · Vancouver · Toronto

© UBC Press 2010

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, without prior written permission of the publisher, or, in Canada, in the case of photocopying or other reprographic copying, a licence from Access Copyright (Canadian Copyright Licensing Agency), www.accesscopyright.ca.

21 20 19 18 17 16 15 14 13 12 11 10 5 4 3 2 1

Printed in Canada on FSC-certified ancient-forest-free paper (100 percent post-consumer recycled) that is processed chlorine- and acid-free.

Library and Archives Canada Cataloguing in Publication

Plamondon, Aaron, 1975-

The politics of procurement : military acquisition in Canada and the Sea King helicopter / Aaron Plamondon.

Includes bibliographical references and index.

ISBN 978-0-7748-1714-1

1. Canada. Canadian Armed Forces – Procurement. 2. Canada – Armed Forces – Procurement. 3. Defense contracts – Government policy – Canada. 4. Canada. Canadian Armed Forces – Equipment. 5. Canada – Armed Forces – Equipment. 6. Military helicopters – Purchasing – Canada. 7. Sea King (Helicopter). 8. Defense contracts – Canada. I. Title.

UA600.P53 2010

355.6'2120971

C2009-905204-0

Canada

UBC Press gratefully acknowledges the financial support for our publishing program of the Government of Canada through the Book Publishing Industry Development Program (BPIDP), and of the Canada Council for the Arts, and the British Columbia Arts Council.

This book has been published with the help of a grant from the Canadian Federation for the Humanities and Social Sciences, through the Aid to Scholarly Publications Programme, using funds provided by the Social Sciences and Humanities Research Council of Canada.

Cover image: *Top*: A sunrise view of a CH-124 *Sea King* on the tarmac at 438 Tactical Helicopter Squadron (438 Tac. Hel. Sqn.). *Bottom*: Operation Sextant, Indian Ocean: Captain Joel MacDermaid, a Navigator from 443 Maritime Helicopter Squadron.

Sources: CF photos by Sgt. René Dubreuil and by Warrant Officer Carole Morissette. *Courtesy of National Defence. Reproduced with the permission of the Minister of Public Works and Government Services, 2009*

UBC Press
The University of British Columbia
2029 West Mall
Vancouver, BC V6T 1Z2
604-822-5959 / Fax: 604-822-6083
www.ubcpres.ca

Contents

List of Illustrations / vii

Preface / ix

Acknowledgments / xxi

Abbreviations / xxv

Introduction: The Canadian Defence Procurement System / 3

- 1** Procurement in Canada: A Brief History / 15
- 2** Early Helicopter Operations: The Exploration of a New Capability / 31
- 3** The Procurement of the *Sea King*: Slow but Solid / 51
- 4** The *Sea King* in Canada: Time Is the Enemy of Us All / 65
- 5** The New Shipborne Aircraft Project: A Commitment to Replace the Fleet / 83
- 6** The Vulnerability of the NSA: Political Parrying/ 107
- 7** The 1993 NSA Cancellation: Money for Nothing / 125
- 8** The 1994 White Paper and the New Statement of Requirement: The Ghost of Procurements Past / 141
- 9** The Maritime Helicopter Project: Procuring on Eggshells / 161
- 10** The *Cyclone* Decision: *Caveat Emptor* / 177

Conclusion / 189

Notes / 207

Selected Bibliography / 235

Index / 243

List of Illustrations

Operation ALTAIR: A CH-124 *Sea King* helicopter conducts a wet hoist exercise / viii

A formation of three CF-18 *Hornet* Aircraft / 2

Left side view of a CF-105 Jet Fighter Aircraft Avro *Arrow* in flight / 14

Sikorsky S-55, or H04S *Horse* Helicopter / 30

Active Endeavour: Hoisting exercise aboard HMCS *Iroquois* / 50

HMCS *St John's*: Cpl. Dan Fanning, an Aviation Technician (AVN), cleans and checks pylon on a CH-124 *Sea King* helicopter / 64

Crewmembers from HMCS *Winnipeg's* helicopter detachment prepare a CH-124 *Sea King* for flight operations in the Gulf of Oman / 82

EH-101 Maritime Helicopter / 106

HMCS *Ville de Québec* exchanges its CH-124 *Sea King* helicopter for another / 124

CH-149 *Cormorant* Helicopters on tarmac at Sydney Airport / 140

A *Sea King* helicopter onboard HMCS *St John's* takes off for Chardonnière, Haiti / 160

Composite image of the new CH-148 *Cyclone* helicopter / 176



Operation ALTAIR: A CH-124 *Sea King* helicopter conducts a wet hoist exercise on 28 May 2008.

Source: CF photo by M.Cpl. Robin Mugridge. Courtesy of National Defence. Reproduced with the permission of the Minister of Public Works and Government Services, 2009

Preface

When the Avro *Arrow* was cancelled, at least there was a study involved in the decision. The cancellation of the *Sea King* replacement involved no study at all, and this was really an unforgivable error. It was our worst national procurement mistake ... worse than the *Arrow*.

– Former Chief of the Defence Staff General (retired)
Paul Manson

The procurement of military weapons and equipment in Canada has often been controlled by partisan political considerations – not by a clear desire to increase the capability of the military. Actual military strength has typically been given a low priority by Canada's civilian leaders. As a result, Canada has often failed throughout its history to be effective in the design, production, or even purchase of weapons and equipment necessary for its military to carry out the priorities of the civil power. To secure even the most modest materiel, military officials have had to comply with a succession of rules that can only be described as illogical from the standpoint of military performance. Much like Alice in *Through the Looking Glass*, they have had to run twice as fast just to stay in the same place. National Defence Headquarters (NDHQ) has not helped itself, however, by making the process more efficient from its end. The internal process has continually evolved into an amorphous mass of bureaucracy, with a myriad of committees that require endless analyses, re-evaluations, and approvals. The history of the *Sea King* maritime helicopter and the failed attempts to replace it over three decades is a product of all these weaknesses within the Canadian procurement system. It is the ultimate case study.

This is a story of delays. The word, and all its possible synonyms, will, in fact, be overused. There is simply no way around it. This study reveals the

increasing timeline of procurement in Canada by tracing the introduction of naval helicopters in the 1950s, the procurement of the first modern Anti-Submarine Warfare (ASW) helicopter, the Sikorsky *Sea King* in 1962, and the multiple failed attempts to replace it. As I will explain in the Introduction, the procurement process evolved over time and used varying nomenclature but was usually composed of several fundamental elements: a definition of military requirement; validation of the requirement; government approval of the project; selection of a procurement strategy; bid solicitation and source selection; negotiation and award of contract; administration of the contract to purchase the piece of equipment decided on; delivery of the product, life cycle support, and eventually disposal.¹ Although these phases have been present throughout the period of this study, the time that it took to complete them continually increased. Early helicopter acquisition needed only a few pages to state the requirement; by the time that the New Shipborne Aircraft (NSA) project was initialized in 1985, these documents were referred to in volumes. Discussions on the replacement of the *Sea King* helicopter fleet officially began in 1975. By the time that this book is completed, it will still be years away. It has now been a decade since military analyst Joseph Jockel surmised that “the Sea Kings are now operationally useless, except for helicopter training and providing some utility lift, largely because their sensors are outdated and very difficult to keep functioning at all.”² The fact that the attempts to replace the *Sea King* necessitate a book-size study reveals that there is a procurement problem in Canada. The fact that the story is ongoing reveals that the problem is severe. It could be the most poorly executed military procurement ever undertaken – anywhere.

Helicopters have a long and proud history in Canadian naval operations. The use of a medium-sized helicopter aboard smaller Destroyer Escort (DE) vessels instead of aircraft carriers in the 1950s was a distinctly Canadian idea. The technical innovations used by Canadian engineers to carry this out changed how ASW operations were conducted by every modern navy in the world, including those of Britain and the United States. There are few examples, indeed, where Canada can lay claim to such initiative and ingenuity regarding military matters. As Canada had only one carrier, naval officers believed that, if they could fly helicopters from their smaller vessels, they could maximize the potential of their ships. These vessels were already lagging behind Soviet submarine technology. Discussions on the procurement of a fleet of ASW helicopters for the Royal Canadian Navy (RCN) had been ongoing since 1954, and by 1961 officials were still wavering over which aircraft to buy. This waffling was due largely to the uncertainty of the role that helicopters were going to fulfill in the RCN and rivalries between the three Canadian services, army, air force, and navy. A further complication with the introduction of helicopters into the RCN was the completion of

trials for the Hauldown and Rapid Securing Device, or *Beartrap*, as it was more commonly known. The *Beartrap* was the integral component of the helicopter-carrying DE platform that allowed a large helicopter to land on such a small ship in the turbulent conditions common in naval operations. It was designed and built in Canada. As it was a new technology, it was necessary to put it through extensive testing before helicopters could safely fly from destroyers. The concept had been conceived in 1955, and the design, production, and development trials were carried out throughout the 1960s. The *Beartrap* was later patented in Canada.

The *Beartrap* formed the basis for the procurement of the first advanced ASW helicopter in Canada – the Sikorsky *Sea King*. This aircraft was acquired to counter the Soviet submarine threat during the Cold War. After its introduction into the RCN, it quickly mitigated the problem of a lack of modern Canadian ships to carry out the ASW commitments within the North Atlantic Treaty Organization (NATO) that Canada had accepted in 1949. As Martin Shadwick has written, “a formidable ASW tool in its own right, the *Sea King* breathed new life into surface vessels which were clearly outclassed by the latest nuclear-powered submarines.”³ Marc Milner agreed: “The *Sea King* was a big, powerful machine ideally suited to the ambitious shipboard helicopter concept developed by the RCN.”⁴ The first *Sea King* landed in Canada in 1963, and the last was received in 1969. In the same year that the last *Sea King* entered service in Canada, it was announced that the RCN’s only aircraft carrier, Her Majesty’s Canadian Ship (HMCS) *Bonaventure*, was to be retired from service. This would have a profound effect on ASW helicopter operations. As fixed-wing aircraft were phased out at sea along with the *Bonaventure*, the *Sea King* fleet was to make up for their absence.

The ASW capability of the *Sea King* began to lag behind subsurface technology in the 1980s. The *Sea King* was to be replaced in the early 1990s, and it was already clear that naval helicopters would be used for much more than ASW in the post-Cold War era. They were to contribute to the maintenance of Canada’s sovereignty and security through active participation in drug interdiction, environmental monitoring, fisheries protection, search and rescue, international peacekeeping and humanitarian aid, control of maritime approaches, and response to international contingency operations, including support to land force operations. The early 1990s saw the *Sea King* deployed in new support roles in the Gulf War, Somalia, Haiti, and the former Yugoslavia. These new roles did not mean, however, that the submarine threat had vanished from international waters or that Canada did not need an ASW capability aboard its naval helicopters. When the Statement of Requirement (SOR) was being written in the 1980s, ASW was still the primary focus. But the strategy of the Department of National Defence (DND) in the early 1990s was to re-equip the Canadian Forces (CF) with adaptable and effective equipment that could perform a variety of tasks over the course of

its service life. Flexibility was essential. It was not certain that the increasing number of countries with sophisticated naval capabilities would behave in a way that was acceptable to Canada or its allies. As a result, Canada's maritime forces needed to be able to operate effectively in a modern naval environment. Defence planning has always been about being prepared to counter future threats, and the replacement of the maritime helicopter capability was overdue by the 1990s. The *Sea King* was no longer effective in the new security environment.

In 1987, the *EH-101* helicopter built by European Helicopter Industries (EHI) was announced the winner of the NSA competition to operate aboard the Canadian patrol vessels then under construction. EHI was a British and Italian consortium established with the sole purpose of creating a replacement for the *Sea Kings* in those navies. The *EH-101* was also selected by the Canadian government because it was the best helicopter available at the time and would complement the new ships in the maritime role. Much like the original *Sea King*, the *EH-101* was selected on merit. Although both acquisitions took far longer than expected to enter into the contract phase, it was obvious at the respective times of selection that both helicopters would increase the capabilities of the navy exponentially. But the selection of the *EH-101* model by the government in 1987 was not the final phase of the NSA procurement process; in fact, it was really just the beginning. Although it took over a decade to choose a helicopter after the creation of the original SOR by the military, this event marked only the beginning of a new process of work and investment that was never to have a result.

EHI had presented the best bid with the best product. The 1987 Defence White Paper, however, had determined that the protocol for major Canadian defence acquisitions necessitated the inclusion of Canadian industry in their completion. The policy of securing Industrial and Regional Benefits (IRBs) as part of major defence contracts had become most explicit with the procurement of the long-range patrol aircraft (LRPA) in 1976. The procurement of the CP-140 *Aurora* went beyond the traditional "Canadian content" provisions and included specific contractual obligations on the company, Lockheed Aircraft Corporation, to attempt to achieve a wide variety of economic objectives in Canada over the lifetime of the program.⁵ The company had to "offset" the cost to Canada by somehow contributing to the national economy and facilitating industrial involvement in the project. Offset policies were certainly not unique to Canada.⁶ The procurement of the *Leopard I* tank and the *CF-18* jet fighter later followed this theme. The contract for the Canadian Patrol Frigate (CPF), awarded in June 1983, also aspired to maximize the participation of Canadian industry. It went one step further, however, and dictated to industrial bidders that any foreign contractor would have to form a consortium with a Canadian company, which would then lead the project. The goal, of course, was to stimulate the Canadian defence

industry. The 1987 Defence White Paper continued the policy of tying domestic economic development to military procurement.

Although defence policy must clearly be based on political considerations, defence purchasing should be based primarily on military capability to allow the forces to carry out their mandate. The Canadian procurement policy that began in 1976 and continued in 1987 prevented expedient acquisitions by focusing on non-military considerations. The result was that, after the NSA bid was accepted, it took another five years to determine how Canadian industry would be involved in the process. This was called the “Contract Definition Phase,” and EHI did not make its final bid to the government on how it would be implemented until 1992.

EHI’s first offer to the government on how it would include Canadian industry was rejected in 1990 because it was considered too expensive. At approximately the same time, the government was considering whether to combine the NSA project with the New Search and Rescue Helicopter (NSH) project. This merger subsequently became a reality. The decision was based on the economic advantages that could be achieved if only one aircraft was used for both roles. This was commonly called “fleet rationalization.” It was to involve a joint life cycle cost savings and a joint purchase through a common program office. But the merger of the two projects also meant that EHI had to re-establish its implementation plan based on new numbers and requirements. Government policy demanded that the solutions to these new requirements be resolved by Canadian industry. This policy obviated the purchase of the models already established by the British and the Italians. The NSA, therefore, returned into limbo, and the focus on the IRB policy hindered further progress on the NSA/NSH project. It was determined by EHI and the government that the company would provide the airframe but that the electronic mission suite inside would be assembled by Canadian industry. Some of the electronics had not yet been designed. It was speculated that approximately 400 companies were to be involved in the NSA project.

In July 1992, the government announced the award of a contract to EHI for the provision of fifty *EH-101s* – thirty-five for the NSA and fifteen for the NSH requirement. The NSA version was to be called the CH-148 *Petrel* and the NSH the CH-149 *Chimo*. The total cost was \$4.4 billion. Although the project had been part of the public record since its beginnings in 1985, it was not until the summer of 1992 that there was any serious challenge to it by the Liberal opposition. By early 1993, the Conservative party in power had begun to fracture, and the economy was in a recession. At the best of times, defence expenditures in Canada are largely unpopular. In a time of fiscal restraint, a multi-billion-dollar deal to purchase military equipment was an easy target for the Liberals. Savvy politicians, led by Jean Chrétien, deemed the contract a waste of money.

The project became a topic primarily because it had taken too long to sign the final contract for delivery. This delay was due to the government policy of designing, producing, and assembling a Canadian mission suite into a foreign aircraft. As Canada entered into an election year, one political decision had created the opportunity for another. The project had gone on for too long with too few results. The political opposition seized on the inability of the party in power to convince the electorate of its necessity. Attempts to replace the *Sea King* had been under way since the 1970s, and the *EH-101* had been unanimously determined by the experts after extensive analysis to be the best model. None of its competitors, whether certified or in the design phase, came close to matching its value for money. But this was either never understood or ignored by Canadian citizens. It is far more likely that most Canadians did not comprehend the true nature of the purchase as a result of the effective Liberal campaign of misinformation. The opposition employed a dual strategy of exaggeration. First, they attacked the cost of the program, extrapolated the numbers to fit their objective, and refused to acknowledge that the final cost of the program was not just for the helicopter but also for its lifetime costs of maintenance. They also insinuated that the entire amount was to be paid immediately by the DND instead of the actual thirteen-year budget disbursement. Second, they created the illusion that the *EH-101* was an “attack” helicopter used solely to hunt Russian submarines and persisted in the assertion that, in the peaceful times of the post-Cold War era, this capability was not needed. The argument was simple: after the NATO treaty was signed and the Canadian government agreed to a central role in ASW, the acquisition of a fleet of modern naval helicopters designed for that purpose was justified. With the end of the Cold War, the Liberals extolled to the public how peace and stability would be the norm and removed the primary rhetoric for shipborne ASW and the replacement of the *Sea King*.

On 25 October 1993, the people of Canada voted for a government that they knew would cancel the helicopter replacement. There were, indeed, other issues at hand. Rarely do defence issues shift the momentum of an election in Canada. Only in 1911 and 1963 was defence an issue of magnitude. In the 1911 election, Prime Minister Sir Wilfrid Laurier was forced to defend his earlier establishment of a distinct RCN. The 1963 election centred on Prime Minister John Diefenbaker’s refusal to fulfill commitments that his government had made through NATO and the more recently signed North American Air Defence Command (NORAD) to acquire nuclear warheads for weapons systems that Canada had already bought.⁷ And in 1993, cancelling a major defence contract was part of the official Liberal platform; it was something that Chrétien said he would do, and when he was elected he did it. He cancelled the NSA/NSH within hours of officially taking power. It was an ostentatious demonstration to show that he would be a man of

his word – that he would not hesitate to carry out the promises that he had made. Chrétien gave the impression that he would lead through action. The total costs of the contract termination amounted to \$478.3 million.⁸ The loss of work and investment to the Canadian defence industry, including the millions invested into research and development, was far more economically damaging. Workers across the country were laid off the day after the cancellation.

David Bercuson has written that, “of all the interesting, dramatic, exciting[,] aspects of defence policy and military operations, none is more dull than procurement. The very word seems to induce boredom.”⁹ Not so with the *Sea King* saga. The CF’s attempt to replace the *Sea King* has ultimately turned into the worst procurement failure in Canadian history, even surpassing the ignominy of the A.V. Roe (Avro) *Arrow* cancellation of 1959. The intrigue of this ongoing story will only continue as more information that is now hiding or classified becomes available. As former *Sea King* pilot Colonel (retired) John Cody has expressed, “this is a subject that is so vast that it will take historians fifty years to sort it all out.”¹⁰ Indeed, there has even been an attempt by the Liberal government to remove any possibility of historical criticism by destroying all documentation that related to the NSA. Colonel (retired) Laurence McWha was in charge of collecting all of the contract documents and paper deliverables at the base in Shearwater at the time and recounted that “I called the Project Office in Ottawa for shipping info. A directive was eventually received to destroy all NSA documents. They went to the Base incinerator.”¹¹

The research for this study has not been easy. Nor will this book be the final word on the NSA cancellation. But it will demonstrate many important themes. Central to this demonstration is that weapons and equipment procurement in Canada has historically been an inefficient process, and the acquisition of a capability for the military has often been secondary to political considerations. When these political factors are the focus, they drastically extend the timeline of acquisition. And in Canada, the longer a procurement takes, the more politically vulnerable it becomes. The cancellation of the *Arrow* project and, later, that of the NSA, have made this clear. Former Chief of Defence Staff General (retired) Paul Manson has put it succinctly: “The Maritime Helicopter projects appear to reinforce the common perception that there has been inordinate growth in procurement times for military equipment in Canada over the past several decades.”¹² After all the years of analysis on what was needed in a new naval helicopter, which model would be best suited, and how Canadian industry would be involved, the analysis turned to how much it would cost to scrap the whole thing.

After over a decade of preparation, the attempts to replace the *Sea King* were thwarted by political opportunism. The cancellation had little to do

with discussions of compatibility with or capability for the navy. Indeed, there was no discussion between the Liberal government and its military advisers on the NSA project. As Colonel Cody has asserted, "I think history will tell the rest of the story, which was that the Government didn't give a hoot about us in particular or the Canadian Military in general."¹³ Chrétien had, in fact, made it clear during the 1993 cancellation that he would not "lose any sleep over it."¹⁴

The following year the Defence White Paper reiterated the fact that there was an urgent need to replace the *Sea King*, and the DND would begin immediate work on the procurement of new helicopters. They were to enter Canadian service before 2000. It also stressed the purchase of off-the-shelf equipment to avoid technologies still under development. The first step, as always, was for the military to define what it needed in an SOR. It was to be based on the White Paper, which stated that the military needed to be a multi-role, combat-capable force able to fulfill a series of other DND mandates, such as assistance in protection of the fisheries, drug interdiction, environmental protection, humanitarian and disaster relief, and potential demands for aid to the civil power.

Although any replacement of the maritime helicopter role would obviously need robust capabilities to carry out this variety of tasks, some of the senior officers in charge of the procurement were afraid to base the SOR strictly on military requirements. They had been warned by their political masters not to exceed minimum requirements. These officers hardly needed a warning, however, as they understood how the cancellation of the NSA/NSH had politicized the issue. They knew that, if they created an SOR that led to the most capable aircraft, still thought to be the *EH-101*, the government would balk at the acquisition to avoid the embarrassment of buying the same helicopter that they had already renounced as unnecessary. The result was that the SOR had to be constantly rewritten to make it politically acceptable. The necessary capabilities of the maritime aircraft were reduced by 25 percent. The idea of creating an SOR not based on complete threat assessments and what the helicopter would be required to do, and where it would have to do it, was opposed by many at the DND.

It was decided by the government that the Search and Rescue (SAR) helicopters would be replaced first, and the SOR for the new Canadian Search and Rescue Helicopter (CSH) was completed in the summer of 1995. The *EH-101* won again. It was then being called the *Cormorant*. Although the government tried to avoid making the decision through various independent assessments regarding the validity of the competition, it was forced to concede that the *EH-101* was still the best aircraft or face a powerful legal battle with EHI. The political fallout over the CSH procurement served as an example of what had to be avoided for the *Sea King* replacement, by then

being called the Maritime Helicopter Project (MHP). The government would require as many helicopters as possible to compete, and the only way to do that was to intervene in the acquisition process before the release of the Request for Proposal (RFP) to industry. It continued to reduce the Requirement Specifications (RS) for the aircraft that determined the final form of the RFP to allow less capable helicopters to compete. The final SOR was not complete until the summer of 1999 – five years after the first draft. The weaknesses of this portion of the procurement are shared by the DND as it was up to that department to submit the documents to the government for review. Although its trepidation over the SOR was justified, it only contributed to the already protracted procurement timeline.

The political pressure on the military and MHP office to reduce the RS was only one tactic available to the government. It also had the authority to decide the form that the final procurement strategy would take. The Liberals then created a committee chaired by Deputy Prime Minister Herb Gray to assess the process. As Colonel Brian Akitt, a former *Sea King* pilot and project director of the MHP, explained, “the introduction of the Gray Committee ensured that the Government had intervention into the process at the Departmental level thereby ensuring that the choice of procurement strategy and the definition of requirements would no longer fall within the purview of the Department. The military component of the relation was effectively neutralized.”¹⁵

On 17 August 2000, the Chrétien government gave the DND official approval to proceed with acquiring a replacement for the *Sea King*. It had been decided to split the contract between a company that would build the airframe and another that would build and integrate the internal mission systems. It was explained that this unconventional strategy was chosen to broaden the list of companies able to compete for the project. The hope was that, with more companies involved, it would be less likely that the competition would once again lead to a variant of the *EH-101*. But it also meant that the project office had to establish two sets of requirements in anticipation of dealing with two separate prime contractors. This political decision increased the risk of massive delays and cost overruns due to the modifications that would be necessary to incorporate the electronics inside the airframe and then recertify the aircraft. This procurement strategy was questioned by senior officials in both the DND and Public Works and Government Services Canada (PWGSC), which was responsible for tendering all major national contracts. It also ignored the lesson of the NSA/NSH of incorporating too many companies into one acquisition.

Perhaps the most important decision regarding the procurement process that would mitigate the strength of the then named AgustaWestland International Limited (AWIL) *Cormorant* bid was the government’s choice to use a “lowest-cost-compliant” methodology. This decision meant that, as long

as a company was compliant with the RFP, if it submitted the lowest bid, then it would be declared the winner. This matrix contradicted both the PWGSC and the Treasury Board Contracting Policy of purchasing the best value. It also directly affected the competition as the *Cormorant* was a more capable and certified aircraft with more future potential than the rest of the field – but it was also more expensive. The split procurement based on lowest cost also extended the first delivery date to 2008 from 2005. So the stage was set once more.

In November 2004, the new Liberal government led by Paul Martin selected the Sikorsky *Cyclone* as the winner of the MHP. The government of Jean Chrétien had successfully avoided making a decision on a replacement for ten years. During this time, the *Sea King* helicopters experienced a series of crashes and ditches at sea – some fatal to the pilots on board. The controversial selection of the *Cyclone* and the way in which the decision had been reached predictably resulted in AWIL suing the government for over \$1 billion in damages. AWIL had maintained throughout the competition that it was not possible for Sikorsky to deliver its still uncertified aircraft to Canada by the 2008 deadline. Although AWIL was fully aware that its bid would be more expensive than that of its competitor, it was certain that Sikorsky's inability to deliver would result in its being deemed non-compliant. The AWIL Statement of Claim to the Federal Court later asserted that the government chose Sikorsky despite its non-compliance because the *Cormorant* was not a politically acceptable aircraft. It alleged political favouritism and extensive errors regarding the evaluation of the bids. AWIL later settled with the government out of court in November 2007 to secure the potential for future business and because a prior Supreme Court decision undermined the strength of its case.

In January 2008, the military staff at 12 Wing in Shearwater was informed that the first *Cyclone* would not arrive until 2010 or 2011. The aircraft was still under development and was not yet certified. Sikorsky also demanded more money. DND officials had consistently held that they would avoid technology under development, especially if it was a first production run, to avoid this exact situation. The government ignored these recommendations in order to allow Sikorsky to compete. Moreover, the government refused to enforce any liquidated damages on Sikorsky for breach of contract. The contract was simply amended to allow a two-year delay and gave Sikorsky an extra \$117 million to make the helicopter compliant with Canada's requirements.

On 12 March 2009, a civilian version of the future *Cyclone*, an S-92, crashed off the coast of Newfoundland and killed fifteen passengers and two crew who were being ferried from St. John's to an offshore oil platform. It was soon discovered that the crash was due to a loss in oil pressure and a subsequent failure in the main gearbox. The results of the investigation also

revealed that Sikorsky was not technically compliant with the advanced standards of the US Federal Aviation Administration (FAA) that required the main gearbox to run for thirty minutes without oil. It was reported that the fatal helicopter crash occurred within ten minutes after the pilots reported oil pressure problems. Sikorsky is currently being sued in a Court of Common Pleas in Pennsylvania by the family members of fourteen of the deceased and the sole survivor, Robert Decker.¹⁶

The lawsuit states that the S-92 is a flawed aircraft and that Sikorsky covered up its deficiencies to avoid costly redesigns. The repercussions toward the MHP program are tangible as the *Cyclone* has the same deficiencies as its civilian counterpart and must become certified before the Canadian government will accept the aircraft.

Although the first discussions of a replacement for the *Sea King* began in the 1970s, three decades of work have produced few results. After the NSA cancellation, the politics of procurement left the Canadian military without the necessary equipment to carry out its missions effectively for at least seventeen years. As this book went to publication the *Sea King* helicopters were still in operation and nobody knew when their replacements would enter service in Canada.

Acknowledgments

I had a great deal of help in the writing and preparation of this book. I must first thank Art Silverman and Will Macdonald in Ottawa. Without their help, I would not have undertaken this project at all. It would not have been possible. Much of the research on the New Shipborne Aircraft project and its eventual cancellation was retrieved as a result of their assistance and generosity. I have also relied heavily on discussions with retired *Sea King* pilots over the years. Sincere thanks go to Colonels John Orr, Larry McWha, Lee Myrhaugen, and John Cody. As they are all former commanding officers of 423 Squadron, they have been a wealth of information on the history of the *Sea King*. Indeed, they have had enough experience with the helicopter over the years! Each one has taken far too much time from their retirement to respond to my incessant questions with extensive conversations and e-mails. This information has been especially vital on a piece of equipment that is still operational, so many official files cannot be released on its deficiencies. I hope to return to the pubs in Halifax where we first met long ago during my research and return the favour. I must also thank Colonel Brian Akitt, who called me up at home one day out of the blue and directed me to all these other fine gentlemen who made this history possible. The help of Christine Dunphy, the Librarian and Archivist at the Shearwater Aviation Museum, is also much appreciated.

The work and guidance of Dr. Michael Hennessy has been vital in my understanding of ship replacement in the postwar RCN. He led me to the minutes of all the Naval Staff, Policy and Projects Co-Ordinating Committee, and Naval Board meetings where I was able to search for the information relevant to my work on helicopters. I would like to thank Mike Whitby at the Directorate of History and Heritage, Department of National Defence, for allowing me to access the extensive records of these meetings. I believe that I was the first student to go out to the new facility, and he did not even have his own photocopier yet. He later told me that he used me as an excuse to submit a proposal for one. I truly appreciated his time in talking to me

about my research during copying breaks. Mike also directed me to the most important work on the beginnings of helicopter-based operations in Canada. The works of Dr. Michael Shawn Cafferky have been integral to my understanding of the early wedding of helicopters to Destroyer Escorts, and they have provided me with the necessary context to write on the history of the *Sea King* purchase. Tim Dubé also facilitated my research by allowing me access to files at Library and Archives Canada that had not yet been catalogued. Major Mike Pollard of the Canadian Forces College also proved to be an invaluable archival source.

The most important factor in my education in military history was my time at the Royal Military College of Canada. It gave me a direct understanding of my chosen field, which I have not acquired anywhere else. I will cherish going back there for the rest of my career. I must give a sincere thank-you to my supervisor, Dr. Brian McKercher. Although he was not part of this final phase of my academic journey, his mentorship during my time at the college allowed me to understand what it is to be a writer and historian. For that, I am truly grateful. I hope that my visits there will include more lively discussions in the Staff Mess.

Perhaps most importantly, I must thank Dr. David Bercuson. His tireless dedication to the field and prolific writing have been an inspiration. His high standards have only made me a better writer. Despite his obvious professionalism and discipline, his relaxed style has also made the process far more enjoyable. I hope that there are more fine cigars in our future. Thanks also go to Drs. Rob Huebert, Paul Chastko, and David Zimmerman for reading through the manuscript in its early stages. I also wish to recognize Drs. Pat Brennan and Tim Travers at the University of Calgary for their historical enthusiasm and for making me a more analytical thinker.

Many thanks go to General Paul Manson for giving me exclusive access to his personal files. I was the first to consult these volumes as they were not yet available through Library and Archives Canada. I also appreciated his reading over an early draft of the manuscript and allowing me to feel confident that I was on the right track. Lieutenant General George Macdonald and former Assistant Deputy Minister (Materiel) Ray Sturgeon also contributed to my work by giving me their valuable insights on the NSA cancellation.

The research for this book could not have been undertaken without the two years of funding from the Security and Defence Forum of the Department of National Defence. The book has been published with the help of a grant from the Canadian Federation for the Humanities and Social Sciences, through the Aid to Scholarly Publications Programme, using funds provided by the Social Sciences and Humanities Research Council of Canada. The Department of History at the University of Calgary also provided scholarships and research grants along the way. The University also gave me the

opportunity to discover the joy of teaching through teaching assistantships and a position as a sessional instructor before my degree was completed. I must also thank Ron Guidinger, Malcolm Munro, Susan Premech, and the Raytheon Canada team for giving me the opportunity to see first-hand how defence procurement is done in this country.

Family members in Ottawa were also invaluable as they provided me with a place to stay during my many research trips. I was always made to feel welcome. And, of course, Jessica, who never wavered in her encouragement or patience during the final phases of the editing process. I must also thank my parents, Sharon and Al, for their enduring support. Everything that I have accomplished is because of them.

Finally, I must include a word or two on the content. This book is not a complete history of all Canadian procurement. Nor is it a complete history of the post-Second World War policies of the Canadian navy, naval aviation in Canada, or fixed-wing aircraft in the RCN. It is about the attempts to replace the *Sea King* helicopter in Canada.

Abbreviations

ACNS	Assistant Chief of the Naval Staff
ACOA	Atlantic Canada Opportunities Agency
ADM Mat	Assistant Deputy Minister (Materiel)
AERE	Aerospace Engineer
AEW	airborne early warning
AIA	Access to Information Act
AIMS	Advanced Integrated Magnetic Anomaly Detection System
AIRCOM	Air Command
AIT	Agreement on Internal Trade
ANCC	Assistant Naval Constructor-in-Chief
AOR	Auxiliary Oil Replenishment
APC	Armoured Personnel Carrier
ASW	Anti-Submarine Warfare
ASUW	anti-surface warfare
Avro	A.V. Roe
AWIL	AgustaWestland International Limited
BAMEO	Base Aircraft Maintenance and Engineering Officer
CA	Contract Authority
CAF	Canadian Armed Forces
CANDESRONS	Canadian destroyer squadrons
CANTASS	Canadian Towed Array Sonar System
CARDE	Canadian Army Research and Development Establishment
CAS	Chief of Air Staff
CASW	Canadian American Strategic Review
CCC	Canadian Commercial Corporation
CCV	Canadian Content Value
CDC	Computing Devices Canada
CED'Q	Canada Economic Development for Quebec Regions
CF	Canadian Forces
CITT	Canadian International Trade Tribunal

CMS	Chief of Maritime Staff
CNS	Chief of the Naval Staff
CO	Commanding Officer
CPF	Canadian Patrol Frigate
CSH	Canadian Search and Rescue Helicopter
CSU	Clearance for Service Use
DARMR	Director Aerospace Requirements Maritime and Rotary Wing
DCER	Documents on Canadian External Relations
DDH	helicopter-carrying destroyer
DDP	Department of Defence Production
DDPA	Deputy Director Public Affairs
DE	Destroyer Escort
DHH	Directorate of History and Heritage
DM	Deputy Minister
DMC	Defence Management Committee
DMS	Data Management System
DMS	Department of Munitions and Supply
DNAR	Director of Naval Aircraft Requirements
DND	Department of National Defence
DOI	Department of Industry
DOJ	Department of Justice
DPB	Defence Purchasing Board
EHI	European Helicopter Industries
ESM	electronic support measures
FA	Financial Authority
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FLIR	Forward Looking Infrared
FOD MOD	foreign object damage deflector
GDC	General Dynamics Canada
GDP	gross domestic product
GOC	General Officer Commanding
GPF	General Purpose Frigate
GPS	Global Positioning System
GST	Goods and Services Tax
HAPS	Helicopter Acoustic Processing System
HELAIKRETS	helicopter air detachments
HINPADS	Helicopter Integrated Processing and Display System
HINS	Helicopter Integrated Navigational System
HMCS	Her Majesty's Canadian Ship
HMS	Her Majesty's Ship
HOTEF	Helicopter Operational Test and Evaluation Flight/Facility
HU 21	Helicopter Utility Squadron 21

IMP	Industrial Marine Products
IRB	Industrial and Regional Benefit
ISA	international standard atmosphere
ISS	In-Service Support
LAC	Library and Archives Canada
LOI	Letter of Interest
LRPA	long-range patrol aircraft
LSO	Landing Safety Officer
LUVW	Light Utility Vehicle Wheeled
MACA	months after contract award
MAD	magnetic anomaly detection
MAG	Maritime Air Group
MARCOM	Maritime Command
MARLANT	Maritime Commander Atlantic
MARPAC	Maritime Commander Pacific
MAWS	Missile Approach Warning System
MHP	Maritime Helicopter Project
MHSOR	Maritime Helicopter Statement of Requirement
MND	Minister of National Defence
MoD	Ministry of Defence
MP	Member of Parliament
MRG	Management Review Group
MTBF	mean time between failure
NATO	North Atlantic Treaty Organization
NBCD	nuclear, biological, and chemical defence
NCC	Naval Constructor-in-Chief
NDHQ	National Defence Headquarters
NDP	New Democratic Party
NFA	New Fighter Aircraft
NORAD	North American Air Defence Command
NPCC	Naval Policy Co-Ordinating Committee
NSA	New Shipborne Aircraft
NSH	New Search and Rescue Helicopter
NSS	Naval Secret Staff
NVG	Night Vision Goggles
PM	Prime Minister
PMO	Project Management Office
PPCC	Policy and Projects Coordinating Committee
PPP	program planning proposal
PRM	progress review meeting
PWGSC	Public Works and Government Services Canada
RA	Requisitioning Authority
RAF	Royal Air Force

RAST	recovery, assist, secure, and traverse
RCAF	Royal Canadian Air Force
RCN	Royal Canadian Navy
RCNAS	Royal Canadian Naval Air Service
RFP	Request for Proposal
RMC	Royal Military College
RNAS	Royal Naval Air Service
RN	Royal Navy
RS	Requirement Specifications
SAM	surface-to-air missile
SAR	Search and Rescue
SCONDVA	Standing Committee on National Defence and Veterans Affairs
SENSO	Sensor Systems Operator
SKIP	<i>Sea King</i> Improvement Program
SKR	<i>Sea King</i> Replacement Program
SMP	Standard Military Pattern
SOI	Solicitation of Interest
SOR	Statement of Requirement
SOSUS	Sound Surveillance Systems
SPAC	Senior Project Advisory Committee
TA	Technical Authority
TACAN/DME	Tactical Air Navigation/Distance Measuring Equipment
TACCO	Tactical Co-Ordinator
TRUMP	Tribal Class Upgrade and Modernization Project
TSB	Transportation Safety Board of Canada
UN	United Nations
USN	United States Navy
USS	United States Ship
VCDS	Vice Chief of the Defence Staff
VCNS	Vice Chief of the Naval Staff
VDS	Variable Depth Sonar
V/UHF	Very High/Ultra High Frequency
VISIT	Vertical Insertion Search and Inspection Team
VX 10	Experimentation Squadron Ten
WD	Western Economic Diversification

The Politics of Procurement



A formation of three CF-18 *Hornet* Aircraft on 26 October 1986.

Source: CF photo by Sgt Boies. Courtesy of National Defence. Reproduced with the permission of the Minister of Public Works and Government Services, 2009

Introduction: The Canadian Defence Procurement System

Any book on defence procurement should start with how the system is supposed to work. This is not an easy task. As Janet Thorsteinson, vice president of government relations at the Canadian Association of Defence and Security Industries, has stated, “Canada’s legal and policy procurement framework is more complex than that of any other nation.”¹ Although there is a standard procurement outline, there are often internal clauses that make each acquisition unique. In fact, the process is often a “moving target.”² A brief history of the process, however, and a description of some of the major changes within it will serve the reader well regarding what each stage *could* look like in any Canadian military acquisition. Although the steps have been given different names over time, the procurement process has essentially included a definition of military requirement; validation of the requirement; government approval of the project, including funding; creation of an official Statement of Requirement (SOR); selection of a procurement strategy; bid solicitation and source selection; negotiation and award of contract, with the possible inclusion of another for long term In-Service Support (ISS); administration of the contract to purchase the piece of equipment decided on; and finally delivery of the product.³ Although most of these phases were present throughout the period of this study, the time that it took to complete each phase continually increased. Further judgment on the process occurs in the following chapters with the history of the ongoing attempts to replace the *Sea King* helicopter.

The First World War revealed the deficiencies of the procurement system in Canada.⁴ In short, there was no effective coordination in dealing with purchases made in Canada by the Allies. Domestic acquisitions were also done ad hoc by each military service (army, air force, and navy), which procured independently of one another, and there were often significant variations in the prices paid by each.⁵ Profiteering was also a major concern. Investigations

into the origins of these problems carried on throughout the interwar period in an attempt to avoid a repetition of this experience in any future war. Although the Department of National Defence (DND) established the Navy, Army, and Air Supply Committee in 1936 under the chairmanship of the Master General of the Ordnance, military procurement continued to be conducted without proper guidelines. This was revealed with the Bren gun contract of 1938. As early as the summer of 1936, the DND came to the conclusion that it would be necessary to arm the Canadian Forces (CF) with the Czech-designed Bren light machine gun.⁶ Although an interdepartmental committee was appointed by Prime Minister Mackenzie King in January 1937 to report on the control of profits on armament contracts, the government was still inexperienced with the intricacies of contracting and weapons development.⁷

On 31 March 1938, a contract for the production of 7,000 Bren guns was signed with the John Inglis Company of Toronto. The total order became 12,000 when the British War Office also agreed to purchase 5,000 of the guns. Although this meant that Canada was successfully getting involved in its own defence production, the contract was quickly criticized since no company besides John Inglis had been given an opportunity to tender for it.⁸ The contract illustrated the struggle between private industry and the Canadian government over who should take primary responsibility for the construction of military materiel. A Royal Commission was appointed to investigate the situation and concluded that the Interdepartmental Committee on Profit Control provided inadequate protection against profiteering. It recommended that any negotiations between the government and private manufacturers regarding armament contracts should be put into the hands of an expert advisory group of competent businessmen.⁹ The government then concluded that a centralized procurement agency, composed of civilians with experience in purchasing, was needed to deal with both Canadian military requirements and anticipated export demands. It was thought that this agency would lead to better economy and administrative efficiency. Accordingly, the Defence Purchases, Profits Control, and Financing Act was passed in 1939 and authorized the appointment of the Defence Purchasing Board (DPB), which began operations in July 1939. Although there had been a wide breach between the spheres of civilian and soldier prior to the First World War, the vast nature of military expenditures and budgetary challenges associated with defence preparedness in the age of total industrial war demanded a new form of co-operation.¹⁰

As a result of the increased equipment demands of the Second World War, the DPB was replaced by the War Supply Board on 1 November 1939, and by the spring of 1940 a full department had been established to handle military procurement. The Department of Munitions and Supply (DMS) was

assigned far-reaching control and operated under special emergency legislation; it was given the power to buy, sell, ration, allocate, or fix the prices of essential supplies and to establish priorities if necessary. In brief, this department was empowered to direct and control war production in any way necessary for the furtherance of the war effort. The DMS handled procurement for the Canadian Forces and also for the United Kingdom, the United States, and other allies to the extent that these countries purchased in Canada. Due to the distinctiveness of military purchases, the DMS also had an independent contract authority entitled the Contracts Authorization Division. Non-military supplies were handled by the Canadian Export Board, which had been created within the Department of Trade and Commerce on 31 January 1940.

Military and civilian planning and production were combined on 18 December 1945, when the Department of Munitions and Supply and the recently formed Department of Reconstruction were amalgamated as the Department of Reconstruction and Supply. The new ministry assumed the duties of its predecessors, which were to construct and maintain buildings and bases and to acquire anything deemed necessary for war or reconstruction, while retaining investigative and enforcement powers to ensure compliance with contracts.¹¹ After the war was over, the emergency powers of this new department were no longer necessary, and military procurement was passed to the Minister of Trade and Commerce in February 1947. From that point on, military acquisitions went through the minister, who used a civilian purchasing agency, the Canadian Commercial Corporation (CCC), which had been established during the war to handle non-military purchasing. It performed the same general functions for the services as had been performed by the DMS: namely, receiving from the services details of their requirements, canvassing the market to determine the best source of supply, awarding the contracts, and following up on deliveries. It did not assume responsibility for inspection of delivered goods, nor did it pay the suppliers; these two functions were the responsibility of the DND.¹²

To meet the needs of an expanded defence program after the outbreak of the Korean War, a separate Department of Defence Production (DDP) was established in April 1951 and took over the role of purchasing agent for the government. The essentials of military procurement, developed during the Second World War, were carried over into the new department. The DDP was only responsible for defence acquisitions; it inspected, constructed, and acquired defence projects and supplies on behalf of the DND while mobilizing, conserving, and coordinating all economic and industrial facilities necessary for military and civil defence. Several crown corporations were immediately transferred to the DDP: Canadian Arsenals Limited, Crown

Assets Disposal Corporation, Defence Construction Limited, Polymer Corporation Limited, Eldorado Mining and Refining Limited, Northern Transportation Company Limited, and the CCC. By these means, the government again supervised the manufacture and sale of essential commodities, such as steel and uranium, as it had done during the Second World War. The Minister of Defence Production retained the right to create crown corporations, fix prices, limit profits, and compel services deemed essential for Canada's defence.¹³

Once a requirement had received internal approval within the DND, a purchasing action was initiated by raising a requisition or contract demand. After that, a contract demand was submitted to the DDP, and purchase negotiations could be started with prospective suppliers. Acting as the CCC's agent, the ministry purchased defence supplies from Canadian companies on behalf of foreign governments. As part of a government-wide initiative, in May 1960 the DDP established an Emergency Supply Planning Branch to plan for the immediate creation of a War Supplies Agency in the event of a nuclear attack.¹⁴ Since the first decision to use civilians for military purchasing, there had always been the issue of them being handicapped by their unfamiliarity with military requirements and the attendant jargon. This problem was circumvented to a large extent by the secondment of military personnel from the three services to assist the civilians within the DDP in dealing with highly technical and complicated equipment.¹⁵

Further change came as the Liberal government of Lester B. Pearson reformed the federal civil service. On 25 July 1963, the duties of the DDP were transferred to a new Department of Industry (DOI). On 4 September 1963, following the Glassco Royal Commission on Government Organization, a central purchasing and supply agency for all civilian departments and agencies – other than commercially oriented crown corporations – was formed when the DOI established Canadian Government Purchasing, Supply, and Repair Services. That year an International Programs Branch was established to “guide and co-ordinate all aspects of the Department's international defence cooperation and export programs,” including marketing and production sharing with England, Europe, and the United States.¹⁶ These DOI branches administered the Canada-United States Defence Production Sharing Agreement and appointed overseas attachés to coordinate NATO defence production. As Cold War tensions finally abated, the DDP was replaced by the new Ministry of Supply and Services on 1 April 1969 under terms of the Government Organization Act.

After Trudeau and the Liberals came to power in 1968, a Management Review Group (MRG) was appointed by Minister of National Defence Donald Macdonald to examine all aspects of the management of the DND. They finally concluded their work in 1972, and the report changed the entire

administrative structure of the DND and the Canadian Forces, which had been unified in 1968.¹⁷ The report recommended that all military research, engineering, and procurement be consolidated under one Assistant Deputy Minister, Materiel (ADM Mat), within the department. Whoever filled the position was to be a civilian with experience in industry. The report maintained that procurement of military equipment should fall solely within the DND due to its complexity and cost, and these specific items would be handled by the new ADM instead of through the Department of Supply and Services. The MRG believed that this change would provide a focal point of accountability, much as the government had when it created the original civilian agency, the Defence Purchasing Board, in 1939. In 1972, the military and civilian elements of the DND and Canadian Forces Headquarters were integrated into a new Canadian National Defence Headquarters (NDHQ). The new position of ADM Mat was created within the new organizational structure. The ADM Mat became responsible for long-term equipment planning and logistics, but the position was also to be responsible for the contracts themselves and was designed to facilitate effective procurement.¹⁸

The next major change was the creation of the Department of Public Works and Government Services Canada (PWGSC) in June 1993 when four departments – Public Works Canada, the Translation Bureau, Supply and Services Canada, and the Government Telecommunications Agency – were combined.¹⁹ In 1996, legislation confirming the merger and establishing the new department was enacted. The department has operated as a common service agency for the Government of Canada ever since. At the time of publication, it was responsible for more than 100 federal departments and agencies each year and had to cover thousands of different purchasing categories. With its creation, there were no longer any special guidelines that differentiated military acquisitions from other government purchases. As A. Crosby has asserted, “that is quite different from what you’ll find in many other countries around the world, such as the United States, Great Britain, and so on, where their department of defence has specific procurement authorities and specific rules.”²⁰

Although the procurement process has continued to evolve since the creation of PWGSC, Canadian equipment procurement has been composed of key elements and has followed a general pattern for major equipment projects, which are those over \$100 million.²¹ Before receiving funding, the individual military services have always been required to internally generate their demands before seeking formal approval from their chiefs of staff. The process has been different for each service and has altered over time. The navy, responsible for helicopter procurement during the 1950s, for example, had the Policy and Projects Co-Ordinating Committee, which

made recommendations to the Canadian Naval Staff, which met and made further recommendations to the Naval Board. The board then passed on their recommendations on necessary equipment to the chiefs of staff, who then passed on their conclusions to the Minister of National Defence through the Deputy Minister.²² Regardless of how each service generated its proposed requirements, these have always been statements of capability deficiency. A preliminary list of potential solutions is then developed, along with initial cost estimates. The project is then commonly entered into a long-term capital plan, which signifies an agreement at the DND level to address the deficiency. Responsibility is then likely assigned to an environmental commander – land, sea, or air – to proceed with the next phases of the project.

The next common phase is the Project Development Phase. The environmental commander chairs a senior departmental committee and approves an overall plan for the project, which outlines what has to be done, who the major people are, and the organizations that will be involved. A project manager is then named. As no funding has been approved by this stage, all staff are internal, and no independent project office has yet been established. Option analysis and risk assessment are carried out along with a refinement of cost estimates against the various options.

A SOR is then compiled and reviewed by the DND's senior management oversight committee. The project profile and risk assessment are then prepared and reviewed with the Treasury Board, composed of the Minister of Finance and other selected cabinet ministers. An initial procurement strategy is developed and reviewed by the interdepartmental Project Advisory Committee for major projects. All this leads to finalizing what is called the Preliminary Project Approval. It is then reviewed by those involved within the DND and then submitted to the Deputy Minister and then to the Minister of National Defence. If approved by the minister, the project plan is then taken to cabinet. If it passes this phase, cabinet submits the project to the Treasury Board for approval of preliminary funding. Essentially, this approval allows further definition work if it is required and sanctions in principle the project based on the rough estimates that have been developed at this stage.

With monetary approval to proceed, the project can enter into a Project Definition Phase. This phase is often long and complicated. In essence, it is the phase during which the desired end product is described in detail. This description includes the minimum standard of operational performance required by the Canadian Forces. It also includes analysis of existing and available technology, often referred to as items "on the shelf"; evaluation of the desirability of a developmental "off the shelf" purchase; budget projections; logistical support requirements; and industrial benefits defined by Industry Canada. Costs, schedules, and risk parameters are finalized along with the development of the SOR. The SOR is reviewed and approved once

again by the DND senior management oversight committee, and the preferred option is then selected. The project profile and risk assessment are updated based on this preferred option and again reviewed with the Treasury Board Secretariat. At that point, more discussions on the risk of the project occur.

For major crown projects, there is automatically an interdepartmental Project Management Office, along with the official Senior Project Advisory Committee (SPAC), established in accordance with Treasury Board guidelines. The interdepartmental Project Management Office is comprised of a team of professionals assembled to help make key decisions on the procurement strategy. It includes PWGSC. Other key interdepartmental members may include the Privy Council, Finance Canada, Industry Canada, Human and Resources Development Canada, Indian and Northern Affairs, Environment Canada, and the National Research Council. The Department of Foreign Affairs and International Trade monitors defence import and export policy. The number of organizations or departments involved has grown and changed over time. What is important to understand is that only the DND is truly worried about actual military capability, whereas the rest are concerned more with things such as regional benefits, national job creation, and taxes.

Canadian defence procurement often includes the need to have Canadian Content Value (CCV). This means that the company awarded a contract must perform part of the work in Canada and use Canadian materials. Although Industrial and Regional Benefits (IRBs) have been a focal part of Canadian procurement throughout its history, particularly in the 1970s, this aspect of defence acquisition was passed by cabinet and became official Canadian policy in 1986.²³ The IRB policy provides the framework for using major federal government procurements to support prolonged industrial and regional development. IRBs are business compensation activities undertaken by the prime contractor in Canada as a result of successfully bidding on a Canadian defence procurement. IRBs can contribute widely to the national economy, including helping small business and improving the national balance of trade. They are important contractual commitments and usually involve highly sophisticated technology that is designed to bring lasting value to the Canadian economy, without the government being responsible for production. As Stephen Martin has explained:

While both co-production and licensed production provide employment and technological benefits for the domestic economy, the establishment of an indigenous production line is a costly business ... purchasers have sought a less costly form of procurement which still generates work for the domestic economy. Typically, this obliges the foreign vendor and its sub-contractors to buy goods and services over and above what it would have bought from

firms in the purchaser's economy. This offset is usually some percentage of the contract price and a time period is often set for its fulfillment.²⁴

Although Industry Canada has the lead responsibility for the IRB program and for establishing what are acceptable IRB credits for a company, the Atlantic Canada Opportunities Agency (ACOA), Western Economic Diversification (WD), and Canada Economic Development for Quebec Regions (CED'Q) have representation on the SPAC. The IRB policy is mandatory for major crown projects, and prime contractors must commit to achieving benefits in Canada equal to 100 percent of the contract value. The company must identify 60 percent of these benefits in its bid.²⁵ These reciprocal investments can either be direct or indirect. A transaction is considered direct if the business activities provide goods, services and/or long-term service support directly for the items being procured by the government. Business activity that is not directly related to the procured items is considered indirect and can be accomplished through investments in areas such as research, education, agricultural commodities, technology cooperation, or raw materials. If a procurement is deemed able to give industrial benefits to Canada, an IRB program is created through Industry Canada, in co-operation with the client department, the DND, PWGSC, and the regional agencies. Clearly, navigation of this bureaucracy takes extended periods of time.

It is at this stage that the final procurement strategy is chosen. It could be based, for example, on the lowest cost or the best value, the latter being a combination of price and quality. It is also determined whether it will be a single contract or split into two to distribute the IRBs. It is often at this time that the government is accused of making a final decision at odds with those who made recommendations based on military capability needed by the CF. The interdepartmental SPAC then reviews the final procurement strategy; if they agree to it, Effective Project Approval can be finalized. The process then needs to be approved by the Minister of National Defence, cabinet, and the Treasury Board. This approval, when it is complete, gives the government expenditure authority for implementation of the project.

The project office then approves the final SOR. Preparation and approval of the SOR are logically preceded by an operational analysis to explain where and when the platform will be employed, against which threats, and what it is expected to accomplish generally. The military requirements set out in the SOR are described in the technical language of industry so that potential suppliers can make a fully informed decision on whether they can comply with the specifications and bid on the contract. This is also done so that government contract authorities can establish the criteria required to evaluate the bids.

This brings us to what is commonly called the Implementation Phase. Prior to the formal Request for Proposal (RFP) released to possible bidders

for the contract, the federal government could use a number of methods to interact with industry. A Letter of Interest (LOI) can be released to possible contenders for the contract. It is meant to eliminate unsuitable suppliers at an early stage, thereby saving time and money for both business and government.²⁶ Most commonly, the contract authority – PWGSC – issues a Solicitation of Interest (SOI) to industry on behalf of the client, the DND. Considering the highly technical nature of defence products, usually only a small number of companies will reply. On some occasions, the RFP may be preceded by a prequalification phase, and only the potential bidders found to be acceptable will receive the RFP. This was the case with the Maritime Helicopter Project (MHP). Part of this prequalification screening involves the Project Management Office meeting with the bidders to discuss the project. This meeting ensures that suppliers are fully aware of the requirements and gives them an opportunity to shape their bids before the formal RFP is issued. This process also includes meeting with Industry Canada and the regional agencies to discuss any potential IRBs. The bidders can then start discussions with other Canadian companies if domestic involvement is a necessary part of the contract; time is needed to negotiate with them, find an affordable solution, and develop long-range business plans.

Finally, the project office issues the RFP. It is usually posted on MERX, the Canadian electronic tendering service, and becomes publicly available; even companies that did not respond to the LOI are usually eligible to respond to the RFP. The project office then evaluates the bids received and selects a winning bid based on a number of important elements. They may include price, value, technical merit, delivery, contract terms and conditions, risk, and IRBs. The project team also evaluates specific proposals such as the Project Management Plan, the System Engineering Management Plan, and the long-term In-Service Support (ISS) Management Plan.

The SPAC then makes a recommendation to the ministers involved on which proposal should be selected for contract award, and a winner is announced. The winning bidder is then invited to enter into contract negotiations with the government. These negotiations are done through the contract authority (CA) from PWGSC, the requisitioning authority (RA) from the DND, which is the liaison between PWGSC and the DND, and the company chosen to carry out the project. There is also the technical authority (TA), which works for the DND and is responsible for technical compliance of the contract, and the financial authority (FA) from the Treasury Board to oversee the exchange of capital. If there is an IRB component, the IRB manager from Industry Canada negotiates with the company directly to ensure that it will fulfill the IRB portion of the future contract. The IRB manager will then decide on compliance and communicate the decision directly to PWGSC.

There are times when the chosen contractor is funded to further define its solution to the stated requirement and to provide to the government a

fully budgeted and substantiated proposal. This was what happened with the contract for the New Shipborne Aircraft (NSA) program signed with European Helicopter Industries (EHI) to replace the *Sea King* helicopters in 1988. Once all the terms and conditions have been met and all parties have come to an agreement, the Treasury Board must give its final consent, and contract approval is then obtained with the consent of cabinet. The final contract is then signed. From that point on, the project office is responsible for managing the delivery of the equipment, which includes ensuring contract compliance; monitoring progress; authorizing payment; managing amendments; and ensuring that, when the equipment is delivered, there are already trained personnel ready to put it into service with the other armed forces. Progress review meetings (PRMs) are usually conducted annually to discuss any necessary amendments to the contract and overall performance of the contractor. Perhaps most important to the contract, the company is responsible for delivering the product; liquidated damages are assessed for any non-compliance. The entire process is then subject to audit by the Auditor General.

As the reader will discover, the process is even more complicated than it seems. Each step within this labyrinth has provided the opportunity for budgetary and scheduling pitfalls. There is no better way to reveal these systemic challenges than to tell the story of the *Sea King* helicopter in Canada.



Left side view of a CF-105 Jet Fighter Aircraft Avro Arrow in flight.

Source: CF photo. Courtesy of National Defence. Reproduced with the permission of the Minister of Public Works and Government Services, 2009

1

Procurement in Canada: A Brief History

Canadian equipment purchases had always involved politics, right back to the 1880s's decision to dress the militia in high cost, low quality Canadian made uniforms in deference to Sir John A. Macdonald's National Policy.

– Desmond Morton, *Understanding Canadian Defence*

The matter of militia equipment leads us to consideration of perhaps the most fundamental, and at the same time the most difficult and controversial problem which arose in connection with the new Canadian defence programme: that of the procurement of armament and equipment. Apart from the great temporary development which took place during the Great War, Canada has never possessed an armament industry of any importance; even at that period, we have noted, no *weapons* were manufactured except Ross rifles. In these circumstances, she was bound to find herself in difficulties when the need suddenly arose for modernizing her fighting services.

– C.P. Stacey, discussing the lack of preparation for the Second World War

For the majority of its history, Canada has been incapable or unwilling to properly equip its military. Failure to design and produce the necessary materiel to support the Canadian Forces (CF) domestically consistently led the government and the Department of National Defence (DND) to search for foreign alternatives. These purchases of foreign military equipment were often necessary due to the limited size of Canadian industry and its inability to compete in international markets – this is often called the economies of scale.

This reliance on foreign sources has frequently hampered the scheduling of Canadian military procurement and created various other problems regarding the introduction of weapons platforms. Although the necessity of equipping a military for operations is equally important to all other factors involved in preparing a national defence force, weapons and equipment procurement in Canada has generally been inefficient.¹ Scandalous acts committed for political gain are not unexpected. It is difficult to assess this fully, however, as the topic has received scant attention from Canadian military historians. As David Bercuson has asserted, "in any well-stocked bookstore today there will be tomes on great military leaders, decisive battles, the evolution of strategy and tactics, intelligence, the art of war, military leadership, even supplies, logistics, and communications. But nothing on procurement."²

The absence of literature on procurement is most notable during the period before Canada's entry into the Great War. There are many publications on the early defence policies, attempted reforms, and personalities involved in Canada's military development before 1914.³ But there is still extremely little on how the Canadian military of that time equipped itself. One reason is that the political parrying between the General Officer Commanding (GOC) and the government's representative, the Minister of Militia, is truly a fascinating story of political patronage, corruption, and lassitude. The other reason is that there is very little to tell; Canada's early militia was thinly armed, and the weaponry used was rarely kept current with other international standards, especially regarding the soldier's basic rifle. The reason, in the early years of the nation, was twofold: first, Canadian governments believed that the British would always be there to save them in the face of an emergency, specifically against the Americans; second, these governments had concluded that there was little tangible threat from the Americans themselves. In short, there was no impetus for Canada's leaders to invest time, energy, and, most importantly, money into the Canadian militia. As C.P. Stacey has asserted, "[Canadian] history is full of warlike episodes, and they have proved on many an occasion that they can be skillful and determined fighters; but few nations have shown more profound antipathy to the idea of military preparations in time of peace, or less interest in military affairs generally except in moments of emergency."⁴ Nowhere has this lack of preparation been more obvious in Canada than in the field of weapons procurement.

Canada has been buying weapons of war since before Confederation in 1867; unfortunately, only certain areas are covered in the literature, and the history of Canadian acquisition policies has remained untold. There exists extensive commentary on the Canadian Ross rifle and the munitions industry of the Great War.⁵ Most authors, however, have focused on the industrial defence effort of the Second World War and the postwar period, particularly

the Avro *Arrow* and the bilateral Defence Production Sharing Agreements between Canada and the United States.⁶ As one of the few authors on the subject, Dan Middlemiss, has written, “notwithstanding the availability of many useful procurement case studies, what is lacking is a general overview of weapons acquisition in Canada.”⁷ This trend likely exists because of the perception that, as one historian has put it, “with the exception of a Government Factory established in Quebec City in 1882, and the Ross Rifle fiasco of 1904-15, the Canadian government made no attempt to establish an armaments industry or even to develop an industrial preparedness policy until just prior to the Second World War.”⁸ These efforts offer an incomplete understanding of Canadian procurement history. Even the latter study, which claims to be a history of Canada’s defence industrial policy, begins in 1935.

Although the present work will not remedy the lack of a comprehensive narrative on procurement history, a few incidents in Canadian history will be highlighted to demonstrate some dominant themes. These trends began even before Canada was a country. In 1862, John A. Macdonald, the first administrator of the Militia Affairs portfolio for British North America, received the first indication that the electorate was not willing to invest in its own defence. The American Civil War and the subsequent Trent Affair of 1861 – where the federal navy seized Confederate envoys aboard a British vessel – had heightened tensions between the United States and Britain. Although direct conflict was averted, the British had begun military mobilization, and it resulted in increased calls for defence improvements in British North America. A Militia Commission was formed in Canada in 1862. When its recommendations came back within the year, Macdonald used them as the basis for introducing a militia bill. The commission reported the need for a trained force of 50,000 and a reserve of the same size. It quickly became clear to the opposition that such a force would cost approximately \$500,000 and that no such investment was possible; instead of proposing amendments, the opposition saw it as a giant target and attacked it absolutely. The Cartier–Macdonald ministry was in a weak position at the time, and with Macdonald drinking heavily the bill was poorly defended; it was subsequently rejected, and the Cartier–Macdonald ministry resigned the next day.⁹ The bill called for an expenditure that was seen by the people as too large for a small colony. From the perspective of the British, its rejection meant that their colony had no intention of defending itself. This example also made politicians in British North America keenly aware that defence expenditures were politically dangerous.

In the 1880s, the government focused on building a public arsenal system to produce all war stuffs for the Canadian militia. The Canadians, for their part, were also more forthcoming than usual on defence as there were riots in Quebec in 1878 and talk of a resurgence of the Irish Fenians in the United

States.¹⁰ The arsenal would be government owned because there was no company willing to undertake the scheme. When the Conservative administration approved the project at the Citadel in Quebec City in 1880, however, it was decided that only ammunition would be produced. Guns and other necessities would, for the most part, still come from England. Cost was always the biggest factor in further developing the arsenal; it remained little more than an assembly plant for expensive imported British materials to create a small number of cartridges. As one author put it, “Canadians, having become accustomed to bearing no responsibility, and little of the cost of their own defence ... in view of the ever decreasing external threat from the USA, thought that any expense, however small, was a waste of money.”¹¹ In addition, it never became a full arsenal system with competing contractors because it was politically healthier for the government to reserve the small number of contracts for industrial friends. Politicians were certainly not going to turn these patronage possibilities over to the military for the sake of development and efficiency; these deals were reserved for loyal party followers who happened to be interested in the military.¹² The nature of early Canadian equipment procurement was, thus, that of political favouritism.

Weaknesses in Canadian equipment during the South African War of 1899-1902 placed pressure on the government to acquire a new rifle for the militia. For the first time, thoughts that concerned defence materialized into serious interest in weapons procurement. In 1902, Minister of Militia Frederick Borden investigated whether British weapon designers would come to Canada and build a rifle. It was believed that it would be more practical to have the guns built domestically to be able to produce more in a time of crisis. After this proposal failed to create any interest, Borden decided that Canada would adopt its own rifle made in Canada and designed by a local entrepreneur, Sir Charles Ross.¹³ The government subsidized production of the Ross rifle, and it became one of Canada’s first weapons purchased primarily for political reasons. As Ronald Haycock has pointed out,

Political manipulation of procurement was rife because acquisitions came under the civilian sphere of the defence department, where they were controlled by the Deputy Minister. The military had no input into this area until well after the turn of the century, and even then acquisition would remain more a political process than a military one. Most often in the post-Confederation decades, the civilian contractors had to be of an acceptable political persuasion, as the Canadian Militia was constituent based and highly politicized, and because few cared about defence.¹⁴

Ross was subsequently given a contract in 1902 and a twenty-five-acre site to build a factory in Prime Minister Laurier’s constituency near Quebec City. Ross paid a dollar a year for rent. But between 1904 and 1907, he failed to

produce the number of rifles stipulated in the contract. He was still being paid in full, however, due to his political friendships.¹⁵

At the Imperial Conference of 1909 on the Naval and Military Defence of the Empire, Sir Richard B. Haldane, the British Secretary of State for War, inquired, "are the Dominions prepared to adopt as far as possible imperial patterns of arms, equipment and stores?"¹⁶ Borden, still the Canadian Minister of Militia, responded that he agreed that all arms should be identical, and the only reason that Canada had a different service rifle than the British Lee Enfield was that he had been unable to convince English manufacturers to establish factories in Canada. He assured Haldane that Canada took "good care to secure a rifle" that used "the same ammunition as the Service rifle of the Imperial army," and therefore there would be little difficulty in co-ordination. Borden felt certain that Canada was in a propitious position to unite with the imperial military, and he confidently stated that using British models was simply common sense and that it took nothing away from local autonomy. The dedication to being independent militarily was, therefore, not adamant, and the Canadians were very receptive to the imperial military pattern regarding their equipment. If they could procure British style kit, they did.

The rest of the story of the Ross rifle is well documented elsewhere.¹⁷ What needs to be understood is that Canada had attempted to build its own weapon and that it was universally determined to be a failure on the battlefield. The Ross was an excellent target rifle, but it was deficient as a service weapon. It was unable to fire rapidly without overheating and seizing up. On the battlefields of Ypres, it was reported that some 3,000 men cast aside their Canadian rifles, most jammed with mud, and armed themselves with British weapons.¹⁸ In a strange twist that showed the politics of the matter, Ross eventually sued the government for \$3 million and was given \$2 million in an out-of-court settlement after the Deputy Minister of Justice advised the government that Ross had a good case based on the vagueness of his contract.¹⁹

The Canadian service rifle was not the only piece of kit considered a failure. The Canadian contingent was originally to be supplied with its own boots and greatcoats. But because of profiteering, much of the manufactured equipment was of poor quality. Two million boots ordered by the War Office were useless as they had been made largely of cardboard and fell apart in the rain.²⁰ Canadian coats were too thin and inferior for British use. It also became known that the Canadian Service Wagon was rejected as it had a turning radius too large for English and European roads.²¹ The McAdam shovel-shield carried by all Canadian soldiers was useless for digging and cutting wire, and they were sold for scrap in 1917.²² The dominion's primary contribution was artillery shell production. The Shell Committee was created on 6 September 1914. But due to political patronage, profiteering, production failures, and extensive delays in shell delivery, it was largely a failure.²³

Although shell production was revamped and improved over the course of the war, the Canadian attempt to deviate from British weapons and equipment models did not succeed.

Sir John Stevens, the British Director of Equipment and Ordnance Stores, stated in 1917 that, after the war,

The general and guiding principle which it is desired to submit is that appropriate steps should be taken to combine the experience of the whole of the Imperial forces in the selection of the most suitable designs of equipment and clothing, and that the designs thus selected should be adopted throughout the Empire with such variations alone as are necessitated ... by differences in climate and other local conditions.²⁴

All the dominions agreed.

By the end of the First World War, Canada's confidence concerning domestic military industry was irreparably shaken due to the failure of its indigenous military equipment.²⁵ Moreover, Canada was financially weakened by the war. It became more expedient, therefore, for the Canadian government to use British models than to pay for independent research and development for its own specific equipment needs. Notwithstanding a constant Canadian quest for independence – best illustrated in the government's insistence on a separate signature on the Treaty of Versailles and its independent membership in the League of Nations – Canada still deemed it expedient to use British military prototypes. As a result, equipment was dictated to Canada because it did not design patterns expressly for its needs; the British were not building for Canadian requirements. Moreover, because of time constraints, Canada often did not have the time to recommend changes to British designs, as such changes would have meant inevitable delays in procurement. Because the Canadian equipment base was already quite sparse, the government simply could not wait for suitable machines to be designed. This meant that Canada was constantly seeking approval for modifications to its own equipment, which often were not possible, due partly to the difficulty in exchanging blueprints. Even something as simple as an aircraft starter had to be ordered from England for £250. When the manufacture of the starter "had ceased to exist and no drawings were available," Canada was simply out of luck. The Air Board decreed that "if we had a complete machine we could use it as a pattern and have more made in this country."²⁶ But they did not. So, in addition to determining which parts were altered, Britain decided when to do so; to keep its planes air worthy, Canada had to follow course. The historic lack of investment in the defence industry has often hindered Canadian military capability, and foreign equipment purchases have placed the Canadian Forces at the mercy of foreign technologies, processes, and political decisions.

Canada even refused to make socks for its soldiers. An Air Board meeting declared in 1922 that “the purchase of waders brogues and socks in England for the Operations Branch was approved at a cost of approximately \$800. The Inspector General asked that a submission be made for the Minister’s sanction.”²⁷ This was myopic in terms of long-term military planning because it did not allow for even the most basic of military kit to be produced in Canada. In the event of a crisis, the Canadian military could easily lose its supplier. This was common practice in postwar Canada. The Canadian government did not desire any freedom concerning equipment designs, and this trend continued at the Imperial Conference of 1926, where imperial standardization again became absolute.²⁸

Although equipment designs were dictated by the Empire, Canada did attempt to manufacture certain weapons domestically during the 1930s. And the contract to build the Bren light machine guns is another example of the political nature of procurement in Canada.²⁹ The primary result of the supposed scandal was that the Canadian government brought in legislation to establish a Defence Purchasing Board (DPB).³⁰ Although the DPB was a good idea, C.P. Stacey has astutely asserted that there was nothing wrong with purchasing the gun from a sole source as it had been decided that it was necessary from the standpoint of military capability. He correctly wrote that “this proved to be one more case where political considerations took precedence over military expediency with unfortunate results.”³¹ The Canadian government, however, was not yet competent in the direct involvement of arms production in the 1930s.

The Second World War forced the Canadian government to invest in its defence industry, and domestic production effectively supplemented the traditional British source. Britain was economically devastated by the war and could not help to arm Canada. Domestic industry subsequently became responsible for *Anson* and *Harvard* training planes, *Mosquito* fighter bombers, *Hurricane* fighters, and *Lancaster* heavy bombers. None of the planes was designed in Canada, and no aircraft engine was made domestically.³² The engines either had to be imported or installed elsewhere.

Canada still did not have trained engineers for its own defence design and construction, and Canadian industry continued to use foreign models. Examples from Britain include the twenty-five-pounder field guns, 3.7-inch anti-aircraft guns, two-pounder anti-tank guns, and Boys anti-tank rifles.³³ During the war, 815,729 transport vehicles and trucks were built in Canada, and they represented one of its most distinguished industrial achievements; however, this situation was facilitated by American dominance over the Canadian automobile industry.³⁴

Canadian industry also built corvettes, frigates, and *Tribal* class destroyers for the Royal Canadian Navy (RCN).³⁵ Although four were ordered in Canada

in 1941, the *Tribal* destroyers were not completed until the end of the war due to a higher priority being given to other tasks. Canadian Minister of National Defence J.L. Ralston later claimed that the British Admiralty had been unwilling to lend naval personnel to assist in destroyer construction in Canada.³⁶ Indeed, the lack of weapons specialists in Canada created many difficulties for the RCN. This problem was most notable in the field of Anti-Submarine Warfare (ASW), which Canada focused on during the war. As W.G.D. Lund has argued, "it was through its commitment to anti-submarine warfare that Canada was able to gain some measure of control in the Battle of the Atlantic."³⁷

The RCN played a role second only to the Royal Navy (RN) in the protection of trade routes in the North Atlantic, and this endeavour created a need for highly developed ASW technology. The RCN had to keep pace with the science of radar, asdic, high-frequency direction finding, and offensive anti-submarine weapons, such as the Hedgehog ahead-throwing mortar. At the outbreak of the war, however, there was not one technical or scientific adviser in Naval Service Headquarters in Ottawa. All of the RCN's weaponry came from Britain, and after the war started and British supplies disappeared, Canada was on its own. The attempt to design and procure advanced technology necessary for the success of the RCN in the North Atlantic has been described as "a national failure."³⁸ David Zimmerman has written that,

Even in weapon design their efforts were a failure because of the dissimilar priorities of the institutions involved and the inevitable conflict that developed between them. The National Research Council of Canada, the supreme wartime scientific agency, and Naval Service Headquarters did not succeed in resolving their difficulties, the effects of which on the anti-submarine campaign were profound as RCN escorts went to sea with inferior, outdated, or unusable equipment.

One exception regarding weapons design in Canada was the *Ram* tank. Although it was based on the American *M-3* medium tank, Canadian engineers believed the fixed gun to be a liability. A Canadian prototype was built in twenty months, and the tank had a cast steel hull, a large revolving turret on a seventy-two-inch ring, and a 75mm calibre gun. It used an American engine. Not only did American defence officials agree that it was a sound model, but they also installed the Canadian turret and gun on what came to be the *M-4 Sherman* tank.³⁹ But as with the *Lancaster* and the *Tribal* destroyers, Canadian inexperience resulted in lengthy production times. There were also engineering and armour plate problems as well as a high final cost for the *Ram* relative to the *Sherman*. The latter subsequently became the main battle tank of the Allies, and the Canadian armoured divisions were

equipped with *Ram* tanks only until they could be replaced by the American model.⁴⁰ Although it was correct to switch to the *Sherman* due to the inability of domestic industry to produce an army tank quickly and cheaply, the disadvantages of the purchase over the production of military equipment became obvious after the war. In 1949, Minister of National Defence Brooke Claxton was forced to write to the US Secretary of Defence as a last resort to try to procure improved bogie wheels and treads for Canadian *Sherman* tanks. The attempt failed because it was claimed that they were needed for US requirements.⁴¹

Canada did have the option to purchase some military materiel in the United States during the war. In August 1940, Prime Minister King and President Roosevelt signed the Ogdensburg Agreement, which established the Permanent Joint Board of Defence to facilitate discussions on the defence of the continent. The Hyde Park declaration was subsequently made in December 1941. It consisted of the approval of a statement by the Joint War Production Committee of Canada and the United States that called for a combined production effort.⁴² The relationship with the United States regarding joint defence production during the Second World War, however, did not completely replace that with the British. J.L. Granatstein is correct in his observation that

The events of the war had marked a historic change in Canada's place in the world. Curiously, however, there was as yet little sign of this in the attitudes, equipment, and training of the Canadian forces. The direct influence of the American military on their Canadian counterparts was still relatively limited. The methods and models for Canadian soldiers, sailors and airmen without question remained British in 1945.⁴³

This trend gradually changed in the postwar period. The Canadian government had made the decision to standardize on American patterns of military materiel in 1947, and all three Canadian military services subsequently moved, to varying degrees, toward that goal.⁴⁴ As Peter Archambault has explained, however, the defence ties with Britain remained substantial despite their lack of formality, and Canada still procured British equipment – the aircraft carrier *Bonaventure* and the *Centurion* tank – when it was to its advantage.⁴⁵

By the Second World War, many defence products were built in Canada and in tandem with its new continental partner. Although the Canadian government did finally accept the concept of military preparedness in peacetime to a small degree after the war, the Canadian military was still forced to rely on a combination of foreign options due to a failure to maintain its defence industry.⁴⁶ Although the transfer to the American production scheme

was due to proximity and burgeoning economic co-operation between the two nations, it was also a symbol of casting off the yoke of the British Empire and conducting business under more favourable conditions.

The Canadian government's endorsement in the late 1940s of the construction of an all-weather jet fighter interceptor – the *CF-100* – is one example of a Canadian effort to advance its defence industry and procure domestically. But the aircraft failed to make an impact on the international market because of a lack of Canadian industrial experience in defence production and meeting deadlines. The design proved that Canadian industry could create superior weapons technology, but its inexperience in manufacturing hurt the project. Canadian industry had also engaged in an overly ambitious project; one company tried to make its first-ever jet engine at the same time as a modern fighter. The company that was to build the new engines and the *CF-100* was A.V. Roe (Avro) Canada, and it began operations in November 1945. It was announced in January 1947 that the TR5 engine, later known as the Orenda, would be ready at the end of August 1949, and the *CF-100* could “tentatively” fly by that time.⁴⁷ Although this was a year later than first expected, it was progress never before seen in Canada. Colonel (retired) Randall Wakelam has written that, “indeed, whether the CF100 flew in 1948 or 1949, the fact that there were deadlines and aircraft at all was marked tribute to the foresight and determination of the air force.”⁴⁸ Although Wakelam is correct that the innovation in aircraft was impressive, firm production schedules are vital to any defence acquisition.

Shortages of the Orenda engine plagued the possibility of deliveries through the first half of 1951. In fact, almost every aspect of the Avro operation was having extreme difficulties. Even after the first ten pre-production aircraft were delivered, a wingspan deficiency forced further delays. The main problem was that, although it had a good design team, the company lacked the expertise and experience to effectively turn the design into production capability and deliver on schedule.⁴⁹ The United States was originally interested in the *CF-100* as it was determined to be a high-quality fighter, but American officials were firm that they could only use the fighter if it was available before September 1952. The United States never acquired the aircraft. The first delivery of the *CF-100* was completed on 30 September 1953. By the end of the Korean War, only ninety fighters had been built compared with the 1,000 *F-86* fighters produced in Canada during the same time.⁵⁰ The Canadian government had spent almost \$750 million from start to finish, and the only sale made of the *CF-100* was for fifty-three aircraft to Belgium in 1957.⁵¹ Despite the increased budget allotments created by the Korean crisis, the Canadian defence industry was simply not ready to undertake such a project, and the aircraft were not ready when they were needed in 1950.⁵² Wakelam admitted this later in his study: “There was no doubt

that the CF100 was a world class aircraft ... The CF100 was the aircraft that the RCAF wanted to succeed. Sadly, AVRO's production capability proved to be too immature to be fully responsive to the changes in priorities and the crash programmes sparked by the events of 1950."⁵³ The necessary challenges that needed to be overcome to succeed in the defence industry were later explained in a Defence Research Analysis Establishment report: "The ability to achieve or retain an internationally competitive position is determined not only by the price at which the existing products are sold but also by the speed with which new and superior products and processes are introduced to the marketplace."⁵⁴ The *CF-100* failed to meet these criteria in the 1940s. The long history to that point of Canadian reliance on foreign sources made the defence industry largely unable to succeed in the independent production of advanced military technology.

A major exception to the reliance on foreign sources for equipment was the Canadian-designed *St. Laurent* class ASW escorts of the RCN. Radically new ships were needed to counter the threat of Soviet submarine innovations.⁵⁵ As a result, Captain R. Baker from the Royal Corps of Naval Constructors proposed that a new design be constructed in Canada based on the British *Intermediate* class destroyer but with a continuous forecastle to allow for more space for operations rooms and communication centres necessary for a modern vessel. The problem was that Canadian shipyards had no experience in preparing a ship design; they had always relied on the British for such complex tasks. Moreover, the technical offices at Naval Service Headquarters were not staffed as a warship-design authority. The Canadian government accepted the idea for a Canadian-designed ship and subsequently authorized the growth of the engineer-in-chief's department. The department expanded from five officers in 1948 to twenty-one, supported by civilian engineers, technologists, and project managers. A Naval Central Drawing Office was also created for the first time, and the Naval Central Procurement Agency was organized as an offshoot.⁵⁶ Davis concluded that "this new professional core gave the RCN the ability to design its own warships from scratch, rather than merely copying those of other Navies."⁵⁷

The result of the new Canadian initiative was the *St. Laurent* class ASW escorts. The ships were based generally on a British design but completely redrawn for modern Canadian needs. In addition to the extra space for operations and communications, the design provided passageways and excellent access routes to facilitate the rapid closing down of the vessel. The *St. Laurent* ships were the first NATO ships to provide such arrangements for closure as a means of nuclear, biological, and chemical defence (NBCD). The design allowed the ship to continue fighting during a nuclear attack.⁵⁸ For the first time, the RCN had designed a major war vessel. The inexperience in weapons and equipment design was still apparent, however, as financial

planning for the original program proved highly inaccurate and the final cost was at least three times more than that first projected. The naval planners also desired that domestic industry be able to fully support the ships, and this meant that the major systems had to be developed or manufactured in Canada. This requirement resulted in a myriad of delays as many of the pieces had to start on the drawing board, and indecision prevailed as to the final shape, weapons, and electronic suite to be used. The *St. Laurent* escorts were not operational until 1955 – three years behind schedule.⁵⁹ Such a situation places any procurement at risk of cancellation. But as Michael Hennessy has written, “the perceived likelihood of general war, however, distracted the government’s attention from matters of ultimate cost.”⁶⁰ The project was also marred by the fact that the ships were quickly shown to be ineffective against modern submarines; they were too slow, and the range of their hull-mounted sonar and anti-submarine weapons was too short.⁶¹ They needed upgrades soon after their introduction to the RCN. Although the *St. Laurent* is a rare example of industrial independence in Canadian procurement history, it was apparent that having ships designed strictly for Canadian needs was a costly and time consuming venture.

The impact of American weapons systems in Canada after the Second World War was not immediate or total. When it came time to send the Canadian Army Special Force to Korea in the spring of 1951, it was equipped with Second World War British-pattern equipment.⁶² The infantry’s rifle was the bolt-action Lee Enfield .303 No. 4, Mk. I. The army’s anti-tank guns, mortars, small arms, tanks, field artillery, radios, signals equipment, and helmets were all from the previous war.⁶³ Once in Korea, the Canadian army began to adopt American-pattern weapons and equipment in piecemeal fashion.⁶⁴ Although doing so placed Canada within a more recognizable North American framework and gave the Canadian government more freedom regarding its weaponry, it continued the trend of trying to adapt foreign designs to Canadian needs. Throughout the Korean War, the Canadian government began to reinvest in a domestic defence industry. One of the primary areas of investment was aircraft to meet the Soviet bomber threat. The desire for a domestic source for aircraft continued after the war, and the result was the penultimate procurement failure in Canadian history – the *CF-105* or, as it is more commonly known, the *Avro Arrow*.⁶⁵

Even Canadian citizens with no interest in military history have heard of the *Avro Arrow*. And since it is perhaps the one topic in the procurement field that has received adequate academic attention, it will suffice to simply outline the events here.⁶⁶ By 1953, the *CF-100* was outdated and was no match for Soviet aircraft.⁶⁷ The answer was the *CF-105* supersonic, twin-engined, all-weather jet fighter. The project had been in development in 1949 and was accepted by the Liberal government in 1953. By 1955, the

necessary redesigns of the airframe and fire-control system had put it vastly over budget. The Liberal government continued to pour money into the venture in the hope of creating the world's best jet interceptor to counter the appearance of the Soviet intercontinental bomber in 1954. But production delays continued. Worse still was the fact that nobody wanted to buy it; it was completely unproven, especially the avionics and weapons systems, and Canada still did not have a reputation for building jet aircraft. As with the *CF-100*, the lack of experience in designing and producing military materiel was a major liability. As Dan Middlemiss has correctly written,

Thus by 1956, the development of the "Arrow" had burgeoned into an all Canadian programme despite the initial intentions by the government to keep Canadian participation strictly limited. As later events were to demonstrate, an attempt of this sort to develop and produce all the major components for a major weapons system by inexperienced manufacturers was almost predestined to fail ... No allowance was made for the inevitable development problems and delays that would be encountered in such an ambitious project.⁶⁸

Former Chief of the General Staff Lieutenant General Guy Simonds criticized the project at the time for consuming too much of the defence budget and ignoring the trend toward ground-to-air missiles. He realized, however, that the desire of the air force, the aircraft industry, and defence research scientists to participate in a project that they could call their own swept aside any opposition to the venture.⁶⁹

By 1957, the Liberals happily passed the problem to the new Conservative government under John Diefenbaker. On the same day that the first *Arrow* prototype rolled off the Avro line, the Soviets launched *Sputnik I* into orbit. The age of intercontinental ballistic missiles had begun, and the rationalization behind the *Arrow* quickly began to fade. On 20 February 1959, the Diefenbaker government scuttled the entire project, and Avro was forced to fire 14,000 employees instantly. The existing prototypes were subsequently destroyed without explanation. The initial reasons for the cancellation of the *Arrow* was that it was obsolete in the missile age and that the American Bomarc defence missile was more appropriate. The truth was that the aircraft had simply taken too long to produce and had become too expensive. The Diefenbaker government had little information on the project and less inkling to search for it. George R. Parkes, the Minister of Defence at the time of cancellation, later gave this interpretation:

We were defenceless against the high powered bomber – we had the old CF-100, it couldn't compete with the modern Russian bomber; we had no supersonic fighter, but the Americans emphasized the fact that they had lots

of them. Now then, the question I had to face ... was, if you scrapped the Arrow, you'd get nothing; what will you do? Will you buy American aircraft to fill in this gap – cheaper American aircraft ... That's where people began to tear their hair and say "you scrapped the Arrow, now you're turning round and buying cheaper (and they would say 'not so good') aircraft."⁷⁰

As Desmond Morton has asserted, "in power, he [Diefenbaker] had taken one hard look at the costs of technological independence, quailed, and fled."⁷¹

The *Arrow* was not the only attempt to design and produce a weapon system for export in the 1950s. Between 1948 and 1955, the Canadian Army Research and Development Establishment (CARDE) had developed a 3.2-inch medium anti-tank round called the *Heller*. It was considered by CARDE to be more accurate than the 17- and 25-pound "pot sabot" round and could be carried and fired by an individual soldier. The Canadian army adopted the weapon between 1956 and 1960. The real goal, however, was to have it procured by both the British and the Americans to improve the level of standardization within the North Atlantic Triangle. Canadian hopes were dashed when the British purchased the Karl Gustav from Sweden instead. The British felt no compulsion to support Canadian weapons development and did not defend the decision to Canadian officials.⁷²

There was also the Canadian *Bobcat* Armoured Personnel Carrier (APC) meant to carry troops quickly into the field in the case of war. The design began in 1953, and by 1956 a prototype had been created. Although the Cabinet Defence Committee had approved its development that year, Canada was still unable to generate any interest from Britain or the United States by 1958. The Canadian army had hoped that it would be the standard NATO APC. The British and the Americans had their own models under development, however, and their projects had taken half the time to get to the same point. It was not until 1964 that the Cabinet Defence Committee finally gave up on the *Bobcat* project due to insuperable costs and remaining technical problems. The Canadian army then looked to the American model of *M-113s* for its APC requirement. As Peter Archambault has written, "the *Bobcat* and *Arrow* projects had met the same fate, for the same reasons: cost overruns; no foreign market; and the failure of the manufacturers concerned to make a successful transition from development to production of the prototypes."⁷³

It was the failure of the *Arrow* program that had the most profound effect on the political will to design and produce weapons and equipment in Canada. After the *Arrow* program was first curtailed in September 1958, the Canadian government began discussions with the United States regarding the future of the Canadian defence industry; the conclusion was to forgo

independent Canadian weapons production and enter into production-sharing agreements with American defence firms. Canadian military officials held minimal influence in this decision, and it was clear that the politicians were going to handle the procurement strategy. The government's objective was to increase the participation of Canadian industry in the production and support of weapons and equipment used in North American defence. But Canada could not afford to do so without some form of sharing agreement between the two nations. The Canadian defence industry was weakened by the *Arrow's* situation and needed help from its neighbour. The American government agreed that this was an effective way for Canada to contribute to continental defence, and a series of Defence Production and Development Sharing Arrangements was concluded near the end of 1958.⁷⁴

This is only a snapshot of the history of procurement in Canada up to the 1960s. It does, however, explain that Canada had, to that point, relied mostly on foreign sources for its military equipment. Canadian industry had rarely designed its own weapons. The most common course had been for the DND and the government to purchase foreign prototypes and then attempt to make alterations to them to meet Canadian needs. This practice had invariably led to delays in the procurement process. The attempt to create a domestic industrial base to tailor weapons and equipment to specific Canadian military requirements had also rarely met with success. Inexperience with weapons design and production had usually resulted in recurring delays and escalating costs. As with the case of the *Arrow*, the longer a defence project goes on in Canada, the more politically vulnerable it becomes. It was within this environment that the DND attempted to procure the *Sea King* helicopter.



Sikorsky S-55, or H04S Horse Helicopter.

Source: DND photo. Courtesy of National Defence. Reproduced with the permission of the Minister of Public Works and Government Services, 2009