

ROYAL CANADIAN AIR FORCE JOURNAL

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The *ROYAL CANADIAN AIR FORCE JOURNAL* is an official publication of the Commander Royal Canadian Air Force (RCAF) and is published quarterly. It is a forum for discussing concepts, issues and ideas that are both crucial and central to air and space power. The *Journal* is dedicated to disseminating the ideas and opinions of not only RCAF personnel, but also those civilians who have an interest in issues of air and space power. Articles may cover the scope of air-force doctrine, training, leadership, lessons learned and air-force operations: past, present or future. Submissions on related subjects such as ethics, technology and air-force history are also invited. This journal is therefore dedicated to the expression of mature professional thought on the art and science of air warfare and is central to the intellectual health of the RCAF. It serves as a vehicle for the continuing education and professional development of all ranks and personnel in the RCAF as well as members from other environments, employees of government agencies and academia concerned with air-force affairs.

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ROYAL CANADIAN AIR FORCE JOURNAL



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The *ROYAL CANADIAN AIR FORCE JOURNAL (RCAFJ)* welcomes the submission of articles, book reviews and shorter pieces (which will be published in the Letters to the Editor, Points of Interest, Pushing the Envelope and Point/Counterpoint sections) that cover the scope of air-force doctrine, training, leadership, lessons learned and air-force operations: past, present or future. Submissions on related subjects such as ethics, technology and air-force history are also invited.

JOURNAL SECTIONS

ITEM	WORD LIMIT*	DETAILS
LETTERS TO THE EDITOR	50–250	Commentary on any portion of a previous <i>RCAFJ</i> .
ARTICLES	3000–5000	Written in academic style.
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POINT/COUNTERPOINT	1500–2000	Forum to permit a specific issue of interest to the RCAF to be examined from two contrasting points of view.

* Exclusive of endnotes

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- The Senior Editor will notify contributors on the status of their submission. It may not be possible to publish all submissions.
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For the Winter issue: **30 October**

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For the Fall issue: **30 July**

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EDITOR'S MESSAGE

As Senior Editor, I would like to take this opportunity to thank our two guest editors from the spring and summer issues of the *Royal Canadian Air Force Journal (RCAFJ)*. Major Bill March, a longstanding contributor to the *Journal*, once again provided some much-needed horsepower in developing the commemorative spring issue highlighting the importance of aviation in the Great War. Not to be outdone, Major James Pierotti, fresh from completing his Master of Arts in War Studies at the Royal Military College of Canada, was eager to lead the charge in producing the summer issue and provided us with another outstanding issue.

In this issue of the *RCAFJ*, we are highlighting what I consider to be a watershed event in the Royal Canadian Air Force (RCAF): the establishment of the Air Power Operations Course (APOC). Since the demise of the Canadian Forces Staff School in 1994, the RCAF has attempted to fill the resultant gap, with varying degrees of success. The Commander RCAF, Lieutenant-General Mike Hood, has championed the establishment of a course that not only provides RCAF junior officers the opportunity to improve their staff skills but, more importantly, provides an environment in which these officers are exposed to the challenges of working at the operational level of war. The expected end result is a complement of graduates who can articulate how air power should be brought to bear during operations when working within that environment.

In order to produce these graduates, we gathered the best junior officers from all disciplines and communities within the RCAF and challenged them to think and work for six weeks at the operational level. Their journey involved lectures on issues from critical thinking and logistics to electronic warfare and the law of armed conflict, as well as planning for RCAF expeditionary operations in environments, such as providing training missions in support of Canadian government initiatives to coalition operations within a combined air operations centre (CAOC). Given the diversity of the student body—aircrew, logistics officers, aeronautical and communications engineers as well as our Royal Air Force, Royal Australian Air Force and United States Air Force colleagues—there were many who found themselves in deep water with only their peers to support them. The requirements for aircrew to explain to the logistics officer how the RCAF goes about establishing control of the air, and the construction engineer to describe to the pilot what needs to be done to house the air detachment and their aircraft and weapons, ensure that these junior officers are now able not only to explain what their profession requires of them, but that they understand all the constituent parts of the air power they are delivering.

As part of this course, the students were asked to write briefing notes and papers on a variety of issues, not only to contemplate the implications of these issues to the RCAF, but also to provide suggestions on how to improve the institution that they will be shaping over the coming years. Having been lucky enough to be one of the lead directing staff on APOC 1601, I believe the articles that follow will leave you assured that the future of the RCAF is in good hands.

Enjoy the read.

Sic Itur Ad Astra



Lieutenant-Colonel Doug Moulton, CD, MBA

Senior Editor



THE AIR POWER OPERATIONS COURSE



BY MAJOR PETRA SMITH, MA (ENGLISH), MA (WAR STUDIES)



Photo : DND

Editor's note: This article is based on a news article that was published December 19, 2016.¹

Today's challenging and unpredictable security environment demands that the Royal Canadian Air Force (RCAF) be led by air power experts who are able to respond to a dynamic aerospace environment anywhere in the world, in any conditions. Recent operations such as Operation (Op) IMPACT, Op REASSURANCE and Op MOBILE illustrate the need for both tactical expertise in delivering air power and air power-minded officers who can plan, task and assess integrated air operations in a dynamic and combined environment at the operational level.

The new Air Power Operations Course (APOC), delivered at the Canadian Forces Aerospace Warfare Centre (CFAWC) at 8 Wing Trenton, develops air power-minded officers who can thrive in complex, integrated aerospace operations—ultimately safeguarding Canadian interests at home and abroad.

“2 Cdn Air Div is extremely proud to be a part of this important initiative to invest in the future of the RCAF,” said Brigadier-General David Cochrane, commander of 2 Canadian Air Division (2 Cdn Air Div). “Our people are our greatest asset—educating our officers in the domain of aerospace operations is critical to the RCAF, as we prepare our future air power-minded leaders of 2030.”

GENESIS

The genesis of APOC came about through a significant amount of rigorous analysis by RCAF senior leadership. 2 Cdn Air Div conducted a front-end analysis (FEA) led by co-chairs Colonel Denis O'Reilly, commander of 15 Wing and former director air force training, and Colonel Kelvin Truss, CFAWC Commanding Officer. The FEA systematically and precisely identified RCAF professional-development requirements for its officers at the captain and major rank levels, the end result of which was APOC.

By analysing doctrine, lessons learned, survey data, command intent and existing curriculum, RCAF senior leaders determined during the FEA that, while the Air Force Officer Development Program offers a good foundation, a crucible-type course for future leaders was required to attain operational excellence.

“There is a requirement for RCAF officers to provide advocacy for, and to ensure the understanding of, air power within a joint community,” Colonel Truss said. “Only through a deep understanding of air power can RCAF officers operate more effectively as a joint partner. CFAWC staff members were involved in the service paper that suggested a course like APOC would be beneficial. The opportunity to develop content and to shape the way the course is delivered has been invigorating for our team.”

SELECTION

Mirroring the Canadian Armed Forces operations planning process (OPP), students, who were selected personally by capability advisory group (CAG) chairs, came from a variety of occupations and communities. The inaugural course included 24 RCAF students and three allied students from the United States Air Force, the Royal Air Force and the Royal Australian Air Force.

A key strength of the programme, Colonel Truss said, is “bringing together, in residence, a number of bright and capable professionals and giving them the opportunity to share knowledge and experience, collectively generating ideas and thinking critically as one body.”

Speaking about the unique benefit of foreign student participation, Lieutenant-Colonel Bruce Barnes, CFAWC's APOC Course Director, said, “Our allied students have engaged very seriously. They have sent their best, and our Canadian students have learned from their allied counterparts.”

CURRICULUM

During the six-week intensive course, students honed their staff skills, delved into aerospace doctrine and conducted several OPP cycles based on four scenarios: humanitarian and disaster

assistance response, non-combatant evacuation operation, peace support operation and full-spectrum warfare.

“The intellectual capital of the RCAF needs to be pushed to the forefront, and only through active participation of eager officers will we be able to leverage this resource,” said Captain Alexandre Gignac, a pilot with 404 Long Range Patrol and Training Squadron, located at 14 Wing Greenwood, Nova Scotia. “I would strongly encourage those who seek to broaden themselves from tactical to operational thinkers to jump in—both feet!”

Students experienced integrated air operations from a variety of perspectives, including the Canadian Combined Aerospace Operations Centre, air task force headquarters and coalition/alliance combined air operations centres (CAOCs). “Bringing together a variety of officers for an in-house course is APOC’s biggest strength,” said Captain Samuel Trottier, a pilot with 430 Tactical Helicopter Squadron, located in Valcartier, Quebec. “The fact that time is allocated exclusively for our education and that we are all at a single location is worth gold.”

To establish a solid foundation, students began the course by learning about air power theorists, air power fundamentals, critical thinking, command and control, rules of engagement, law of armed conflict, electronic warfare, space, cyber, force protection and targeting.

“APOC is an absolutely essential course at the Developmental Period 2 level,” said Captain Andrew Bowie, second-in-command of the Canadian Forces School of Military Engineering. “From the start of our careers, we are taught how to operate tactically, in small groups; changing that mindset to dealing with thousands is a different shift in scale of operations.” Developmental Period 2 is training undertaken at the captain level.

Inspiring and credible guest speakers were a highlight of the course. The students benefited from the wisdom and experience of representatives from the Canadian Forces College, the Canadian Army, the Royal Canadian Navy, Joint Operations Support Group, Director General Space (which now falls under the RCAF), Canadian Joint Operations Command, 1 Wing Kingston, 8 Wing Trenton, Royal Military College of Canada, 2 Wing Bagotville (Air Expeditionary Wing), 1st Canadian Division and the North American Aerospace Defence Command.

“The students take to heart the experience of the guest speakers,” said Lieutenant-Colonel Barnes. “There is real interest; students said that they have never been on a course like this before.”

While the focus of the course was on integrated air operations, students also honed staff skills by writing briefing notes, letters of appreciation, service papers and staff papers in addition to preparing presentations. When asked about what knowledge and skills that he will bring back to his unit, Captain Bowie replied, “How our trade fits into the cultural mosaic of the RCAF, and not just at the tactical level but at the strategic level.”

A CRUCIBLE

In addition to attitudinal assessments, student performance was graded in a range from “exceeded standard” to “below standard,” emphasizing the rigour of the programme. “Student morale has been high,” Lieutenant-Colonel Barnes said. “There is a real sense of seriousness; there is gravity. Students understand that the course content is relevant to their careers as RCAF leaders.” The relationships developed on this course will serve these RCAF members throughout their careers.

THE LEARNING ENVIRONMENT

Colonel Truss noted that CFAWC—which has a library that contains more than 12,000 air power-centric holdings and offers a multitude of discussion areas, a theatre and an environment that can replicate a CAOC—is suited to deliver this training. “The workforce here is rich in experience, both in terms of breadth and depth, with many post-command senior officers,” he said. “Since our business is doctrine development, concept development and conceptual thinking, CFAWC is poised to deliver this type of training and education.”

FOR MILITARY PERSONNEL INTERESTED IN APOC ...

Captains and majors (pre-Joint Command and Staff Programme) who are interested in APOC should advise their respective chain of command to be considered for upcoming serials. Student selection will be based on CAG-chair nominations.

For more information about APOC and other exciting professional military education opportunities, please visit the 2 Cdn Air Div professional-development web page.²

Without a collective appreciation and understanding of the tenets of air power and their strengths and weaknesses, we cannot possibly prevail in our mission. Individual training and the continued professional development of expert airmen [and airwomen] is a core competency that we must continue to provide and that RCAF personnel must strive to achieve.³

– *Air Force Vectors*

Major Petra Smith is the Staff Officer – Professional Development at 2 Cdn Air Div. Career highlights include a deployment to Bosnia and Herzegovina and a posting to the Canadian Forces Snowbirds. She has a Master of English from Midwestern State University and a Master of War Studies from the Royal Military College and is currently completing a doctor of philosophy (PhD) in English from the University of Manitoba.

ABBREVIATIONS

2 Cdn Air Div	2 Canadian Air Division
APOC	Air Power Operations Course
CAG	capability advisory group
CAOC	combined air operations centre
CFAWC	Canadian Forces Aerospace Warfare Centre
FEA	front-end analysis
Op	operation
OPP	operations planning process
RCAF	Royal Canadian Air Force

NOTES

1. "Air Power Operations Course: Building RCAF Leaders of Tomorrow," Major Petra Smith, Canada, Department of National Defence, Royal Canadian Air Force, accessed March 17, 2017, <http://www.rcaf-arc.forces.gc.ca/en/article-template-standard.page?doc=airpower-operations-course-building-rcaf-leaders-of-tomorrow/iwuxm2xt>.

2. "Professional Development," Canada, Department of National Defence, 2 Cdn Air Div, accessed March 17, 2017, http://afdt.mil.ca/en/HQ/DirAFTrg/Trg_Sp/ProfDev.aspx (Defence Wide Area Network only).

3. Canada, Department of National Defence, A-GA-007-000/AF-008, *Air Force Vectors* (Ottawa: Director General Air Force Development, 2014), 32, accessed March 17, 2017, <http://publications.gc.ca/pub?id=9.697371&csl=0>.





The Future of Canadian Military Aviation in the Modern Geopolitical Landscape

By Major Lara Jennings, CD, MA

AIM

The aim of this article is to examine the modern geopolitical landscape and the future effects it will have upon expectations for Canada within alliances such as the North American Aerospace Defence Command (NORAD) and the North Atlantic Treaty Organization (NATO). This article will concentrate on the future employment of Canadian air power in support of global conflict management and which air power-related contributions will be required for Canada to maintain its existing status among its allies while simultaneously ensuring that domestic needs are met.

BACKGROUND

The modern global geopolitical landscape is evolving at a rapid rate. With this evolution come—to name a few—global challenges related to shifting migrant populations, changing state borders, resource scarcity, maintaining Arctic sovereignty and challengers to previously uncontested United States-dominated air superiority. In the near future, a security problem in almost any part of the world will most certainly be treated as a global security problem.¹ Amid this politically unstable world, Canada will be required to define a geopolitical stance that will allow it to continue making meaningful contributions to alliances such as NORAD and NATO, while protecting its own resources and interests. In doing so, it will need to redefine its existing methodologies for air power employment and will need to visit the idea of acquiring new air power capabilities in order to remain globally relevant in the future air environment.

The *Canada First* Defence Strategy (*CFDS*) states that by 2028, the Canadian [Armed] Forces (CAF) will have the capacity to: conduct daily domestic and continental operations, including in the Arctic and through NORAD; support a major international event in Canada; respond to a major terrorist attack; support civilian authorities during a crisis in Canada; lead and/or conduct a major international operation for an extended period; and deploy forces in response to crises. Furthermore, the *CFDS* states that Canada could potentially undergo all of these mission sets at the same time.² While the *CFDS* includes the Army, Navy and Air Force in its commitment to contribute to such a wide variety of operations, the Air Force would likely be a critical player in all of them, meaning that it would need to be able to support all of those missions concurrently. The Royal Canadian Air Force (RCAF), in its current state, is not capable of doing so in a meaningful manner.

The consequences of the changing geopolitical context are vast and will affect every facet of the military. This article will focus solely upon Canada's future employment of aircraft and will not cover land, sea, space or air-related weaponry.

DISCUSSION

Changing Geopolitical Environment: Domestic

In recent years, the Canadian Arctic has faced increased interest from foreign nations who have identified the land's potential for natural resources while recognizing the fact that Canada's north represents a massive, sparsely populated land mass. Canada has been forced to react to this interest by actively pursuing Arctic sovereignty missions such as the annual Operation (Op) NANOOK and other sporadic sovereignty missions such as Op QIMMIQ and Op LIMPID. Due to the vast size of the Canadian Arctic, air power is the only viable method for attaining the required reach within a relevant period of time. As the global strain on natural resources continues to increase, Canada can expect to see increased interest from foreign nations wishing to stake their claims in the previously uncontested Arctic. While the *CFDS* has brought about the purchase of new ships, including icebreakers intended to operate in the Canadian Arctic, air power is critical to ensuring

that sovereignty is maintained. The *CFDS* identifies the Canadian government's commitment to replacing ageing air assets, but it was supposed to have commenced replacements for fixed-wing search and rescue (SAR) aircraft by 2015, fighter replacement by 2017 and maritime patrol replacements by 2020.³ To date, none of these commitments have been carried out and, in the case of the maritime-patrol aircraft replacement, no competition is currently being considered. As a result, the commitments to replacing RCAF aircraft outlined in the *CFDS* cannot currently be trusted.

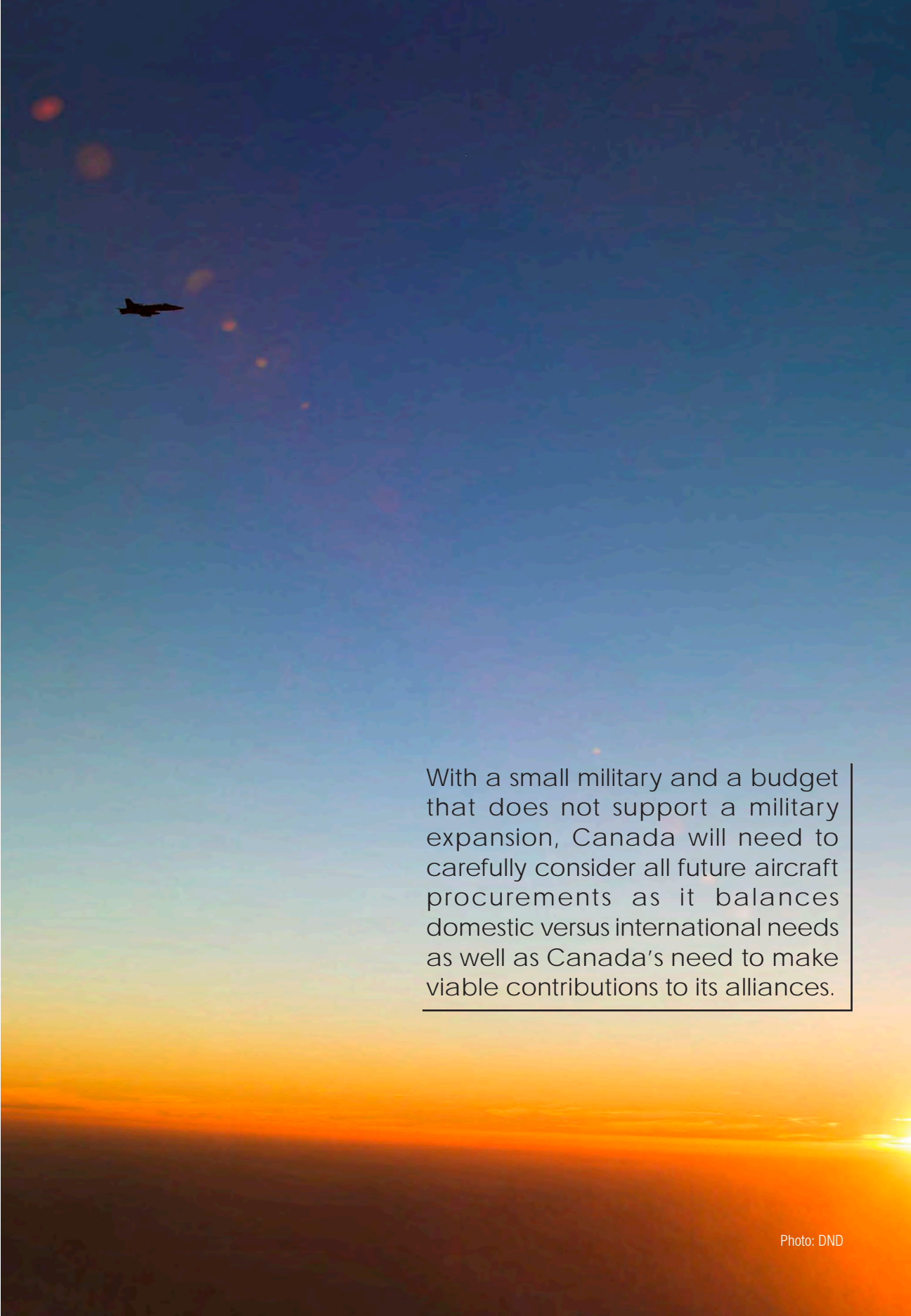
Changing Geopolitical Environment: International

The security state in the Middle East has been volatile at best in recent decades, and current trends do not indicate any changes to this in the near future. The ongoing conflict in Syria has seen over 4.8 million Syrian refugees⁴ flee their homeland and has presented Europe and surrounding states with an unprecedented migrant problem that continues to spur migrant-related conflict within many of these countries. Accompanying this global geopolitical crisis is the potential for shifting borders as, for example, ethnic groups such as the Kurds opt to lay claim to recently liberated land in Northern Iraq. Events related to disaffected populations and internal ethnic land claims will undoubtedly lead to further violence and will cause the Western world to either take sides or withdraw from the Middle East. Europe, too, faces unsettling land disputes, and many believe that Russia's annexation of Crimea in 2014 might simply have represented Russia testing the waters to assess how NATO would respond to its aggression. Recent claims to now-contested territories, while largely unopposed by NATO to this point, stand to become more prominent once the war against the Islamic State of Iraq and the Levant (ISIL) subsides, relative stability returns to the region around Iraq and the focus of NATO member countries can be directed elsewhere.

Canada frequently provides military contributions to major international conflicts, most recently in Afghanistan, Libya and Iraq. Canada can expect to face continued pressure from its allies to contribute to global security, and the Government of Canada has acknowledged that, in the future, "NATO and the United Nations will look to Canada's capacities to accept roles within larger strategic missions in conflict zones."⁵ At the same time, Canada can anticipate being asked by both domestic and international stakeholders to support other humanitarian and peacekeeping interventions. Considering the geopolitical trends outlined above, Canada will need to determine what role it desires for itself on the world stage, what priority its defence initiatives fall under and what international military initiatives it intends to support. With a small military and a budget that does not support a military expansion, Canada will need to carefully consider all future aircraft procurements as it balances domestic versus international needs as well as Canada's need to make viable contributions to its alliances.

Canada in NORAD

Since 1958, Canada has been in an alliance with the United States as a member of NORAD. NORAD has three main missions: detecting and defending against outside airborne threats; detecting and defending against internal airborne threats (Op NOBLE EAGLE) by providing air-to-air intercept and, if necessary, engagement; and maritime warning.⁶ From the context of air power, what this means is that Canada must be able to provide a fast air-intercept capability in order to carry out its mission within the expectations of the NORAD agreement. In order to respond to potential threats, NORAD utilizes aircraft, normally fighter jets, which launch rapidly to intercept, interrogate, and engage potential aerospace threats. Canada does so through the use of the CF188 Hornet fighter jet. Canada took possession of its first CF188 in 1982, and the fleet is now long overdue for replacement. The fleet is undergoing an upgrade that will keep its aircraft flying until 2025,⁷ but Canadian political battles that have caused repeated delays in



With a small military and a budget that does not support a military expansion, Canada will need to carefully consider all future aircraft procurements as it balances domestic versus international needs as well as Canada's need to make viable contributions to its alliances.

the acquisition of a new aircraft are threatening to render even this life extension inadequate if a decision as to a replacement is not made soon.

Domestically, air-to-air refuelling (AAR) tankers are often needed to assist CF188s, particularly during long-range missions such as Arctic intercepts. The RCAF possesses a limited tanking ability consisting of CC130(T) Hercules aircraft from Winnipeg and CC150(T) Polaris aircraft based out of Trenton.⁸ The RCAF's CC150(T) tanking capability is limited to just two aircraft and, at the moment, with one permanently committed to supporting Op IMPACT and the other in routine maintenance, the tanking Polaris is unavailable for operations within Canada. The CC130(T) aircraft do not represent an ideal tanking capability as their fuel load is significantly smaller than that of the CC150, so they are used only when necessary to assist Canadian fighters. As a whole, the RCAF's AAR capability is severely restricted when a CC150(T) is committed to an ongoing operation and Canada has defaulted to utilizing American KC-135s on constant alert for NORAD in order to compensate for its extremely limited tanking capability.

Canada in NATO

Canada has recently faced intense criticism from NATO as a result of its continued failure to meet its commitment of an annual monetary contribution of two per cent of its gross domestic product to defence spending. More specifically, Canada now ranks in the bottom third of its allies when it comes to defence spending, which has rankled NATO heavy hitters such as the United Kingdom to the point where Canada was recently excluded from an anti-ISIL meeting in Paris in January of 2016.⁹ This exclusion could indicate that Canada's NATO allies no longer consider it to be a key player in the alliance. Canada's Minister of National Defence, Harjit Sajjan, has stated that Canada's actions speak louder than its spending percentages and that Canada's overall contributions to NATO have increased from those of the past, citing Canada's contribution to the fight in Iraq.¹⁰ However, the mounting pressure from its NATO allies indicates that Canada will be expected to make even more meaningful contributions to NATO-led military operations in the future.

Considering the lack of public appetite for Canadian soldiers being killed in combat, there is a strong likelihood that Canada will lean on its Air Force to be the major contributor to these future military efforts. As a result, it will be imperative for Canadian military planners and the Canadian government to consider the breadth of contributions that Canada is willing to make to its alliances and, as importantly, to plan ahead to ensure that it has the airborne assets and crews to do so.

Air Power in Future Conflicts

Looking to the future, military demands required to support national security strategies can be expected to include: forces able to deploy rapidly over great distances, missions that can be accomplished while minimizing the risk of friendly casualties, an ability to neutralize an enemy's forces while minimizing harm to non-combatants and an ability to undertake a wide range of missions.¹¹ All of these capability requirements can be related directly to air power and refer to an assortment of mission sets that are outlined below. As General Norton A. Schwartz, former Chief of Staff of the United States Air Force (USAF), stated, "the Air Force will be called upon in a variety of ways in the future to create a variety of effects around the globe in response to a variety of challenges in diverse strategic contexts."¹² While he was speaking about USAF, his comments apply just as readily to future demands upon Canadian military air power. As such, it is necessary to determine what types of future missions the RCAF can expect to participate in, to determine whether Canada possesses the appropriate capabilities to adequately support these missions and to devise a procurement plan if a capability gap is determined to exist.

It is highly probable that capabilities enabling strategic strikes; intelligence, surveillance and reconnaissance (ISR) [both manned and unmanned]; strategic and tactical combat airlift; and humanitarian airlift will be major mission requirements for future air campaigns. What these predictions mean is that future air operations will require: air-to-air fighter aircraft, air-to-ground strike aircraft, close air support aircraft, heavy bomber aircraft, special operations aircraft, AAR, precision guided munitions, ISR capabilities, secure communications as well as effective command and control (C2).¹³ Canada does not currently possess such a wide array of platforms and, while it is not necessary for Canada to possess all of them, careful consideration must be taken to determine what will be necessary to ensure security of domestic airspace while simultaneously being able to provide viable support to international operations. Most of the capabilities on the above list already exist, to some degree, within the RCAF, but these capabilities will need to be constantly maintained in order to ensure their relevance, and it is essential that military planners acknowledge that enemies will continually adapt, which will necessitate ongoing research and improvements to air power technology.

ANALYSIS

For Canada to remain relevant within its two major alliances, it will need to define a foreign policy that clearly identifies the military contributions that it is willing to make, both domestically and to future global conflicts. Given the Canadian public's lack of appetite for loss of Canadian life in global conflicts, the likelihood of Canada's contribution to future conflicts being air-centric vice combat arms-centric is high. This will require Canadian policymakers to clearly define their priorities with respect to RCAF spending and a procurement plan that will allow Canada to remain relevant in a world of rapidly changing technology and capabilities. The platforms currently utilized by air forces include unmanned aircraft (UA), airborne C2, ISR, fighters, AAR, tactical and strategic airlift, SAR as well as helicopters (utilized for troop movement, antisubmarine warfare [ASW] and SAR). Canada currently possesses some of these platforms but has yet to procure robust UA or an airborne warning and control system (AWACS) style of C2 platform. An argument can be made that Canada neither needs nor can afford to field an AWACS or equivalent, as it has traditionally been able to rely on its allies to provide the associated capability; however, strong arguments in favour of UA exist in the international community and Canada.

There are advantages and disadvantages to unmanned technology in comparison to manned ISR platforms, but with continued RCAF-wide manning shortages and extended backlogs in aircrew training systems, the possibility of utilizing unmanned platforms to carry out the ISR role currently performed by a 10-person CP140M Aurora crew must be considered. As stated by author Jeffrey L. Smith, "If the strategic assessment is such that remotely manned systems can better meet national security requirements within emerging fiscal, political, and global considerations, then the Air Force must acknowledge and shape itself around that reality."¹⁴ In a political environment that only tolerates low risk, the safety benefits of utilizing UA over hostile areas of operations, which lead to a combination of greater flexibility and lower risk to human life, cannot be ignored.

Domestically, Canada's biggest challenges involve maintaining its contribution to NORAD, maintaining the reach required to patrol the Arctic and ensure its sovereignty as well as protecting its waters from enemy ships and submarines. In order to deter and defeat domestic enemy air attacks, a combat air-to-air capability must be maintained. The CF188s currently performing that role have less than nine years remaining in their lifespans, which means that a replacement must be identified immediately. While some Canadians question the need for air-to-air defence, the concept of deterrence must be understood and accepted. CF188s provide deterrence against



With the acquisition of the CC177 Globemaster in 2007, Canada's ability to deploy rapidly to areas in urgent need of humanitarian aid has increased significantly. Consisting of only five aircraft, the CC177 fleet finds itself severely overtasked, having to constantly balance the demands of carrying out resupply missions to active areas of operation with providing humanitarian assistance in times of crisis.

potential aggressors to Canada's airspace. Without the intercept capability of these aircraft, it is probable that countries such as Russia that frequently test boundaries with Canada would begin more frequent incursions. As such, Canada must possess a means to defeat enemy air attacks. While the CF188 fleet's recently approved upgrade will extend its life to 2025, a sudden increase to flying tempo that raises the number of hours flown per year by the fleet will quickly decrease that lifespan, meaning that a replacement for the fighter fleet needs to be agreed upon and procured quickly. This is one example of many among the RCAF's airborne assets; it is critical that Canadian military planners take into consideration the future demands that will be placed upon the RCAF when procuring new equipment.

With a limited defence budget, military planners will need to look at procuring multipurpose assets that can operate both domestically and in global conflicts. The CP140M Aurora is an excellent example of a multipurpose aircraft that serves as an ISR, ASW, maritime patrol and antisurface warfare platform. Its versatility allows it to be used for a myriad of operations domestically (e.g., Arctic sovereignty patrols, ASW missions, counter-narcotics missions and patrols of Canadian waters). Planners will need to ensure that this capability is replaced with a platform equally adaptable to a variety of roles and conditions. To further expand upon its multipurpose abilities, consideration should be given to expanding the CP140M role from ISR to ISR attack, where the platform could be armed to become a seek-and-destroy platform, effectively combining the capabilities of two platforms into one. While an additional capability such as this would produce a significant training delta and culture shift, it will be necessary for Canadian military planners to think outside the accepted box in order to maximize our air power capabilities under such a limited budget.

In recent history, Canada has chosen to participate heavily in humanitarian relief missions. With the acquisition of the CC177 Globemaster in 2007, Canada's ability to deploy rapidly to areas in urgent need of humanitarian aid has increased significantly. Consisting of only five aircraft, the CC177 fleet finds itself severely overtasked, having to constantly balance the demands of carrying out resupply missions to active areas of operation with providing humanitarian assistance in times of crisis. A heavy airlift capability represents a positive method by which Canada can both maintain self-sufficiency with respect to resupply and contribute to allied operations and global emergencies. The Canadian government should examine expanding the CC177 fleet, both in terms of manning and assets, as a method of providing an effective contribution to future global problems.

The commitment of a tanker to Op IMPACT has resulted in Canada's two CC150(T) tankers being tied up in a continuous cycle of deployed operations and routine maintenance, with no left-over availability to operate domestically. Furthermore, the airframes are experiencing severe wear from the hot conditions of the desert and there is concern that their lifespans will be shortened as a result. An AAR capability is critical to any fighter force, and Canada must consider either refurbishing or replacing its existing tankers as well as expanding the CC150(T) fleet in order to provide better support to domestic operations.

Regardless of what assets are replaced or upgraded, the existing manpower shortage that plagues CAF will also need to be corrected before Canada can commit to an in-depth, sustained operation. While improved equipment is a necessity in order to remain relevant and interoperable, an improved recruiting campaign and an increase in defence spending to allow for fully manned squadrons and robust training systems are going to be necessary. As stated by professor Elinor Sloan, "Ultimately, increased defence spending is necessary if the Canadian Forces are to make a concrete contribution to the achievement of Canada's future global security objectives."¹⁵

CONCLUSION

To continue to remain relevant in the rapidly changing geopolitical context, Canada will need to continue to develop new operational concepts and supporting capabilities in the aviation realm. Operating in enemy airspace will become increasingly more challenging as more advanced anti-aircraft weapons systems are developed and as enemies procure technologically advanced air-to-air fighting assets. Canada must ensure that its air assets remain relevant and able to combat future foes.

The Government of Canada must define and adhere to a geopolitical stance for Canada that will allow it to remain globally relevant while continuing to protect its own domestic interests. Doing so with a small military budget will require prioritization of air power desires, a clear stance on international support operations, and equipping fleets in a manner that will allow them to carry out a variety of mission sets. With mounting demands upon Western militaries to participate in global peacekeeping and peacemaking initiatives, Canada will need to increase its military spending in order to continue carrying out its NORAD and NATO mandates. Developing multirole aircraft will alleviate the necessity to manage a vast array of different aircraft fleets, but focus needs to be placed upon replacing the CF188 fleet in order to continue to protect Canadian airspace and meet NORAD requirements. Increasing the CC177 and CC150(T) fleets will allow for increased flexibility in response to both domestic and international crises. Additionally, a long-range ASW/ISR asset such as the CP140M Aurora must remain as a priority in order to ensure protection of Canadian waters. These multirole assets combined with increased strategic airlift will ensure that Canada is able to contribute to future international campaigns with relevant, desirable assets.

Major Jennings is a long-range patrol crew commander on-board the CP140 Aurora. With an operational as well as test and evaluation background, she has deployed multiple times, including the United Nations Mission in South Sudan as the Air Risk and Threat Assessment Officer and Operation IMPACT as the Long-Range Patrol Detachment Operations Officer. Major Jennings is currently serving as Tactical Cell Flight Commander with 404 Long Range Patrol and Training Squadron.

ABBREVIATIONS

AAR	air-to-air refuelling
ASW	antisubmarine warfare
AWACS	airborne warning and control system
C2	command and control
CAF	Canadian Armed Forces
CFDS	Canada First Defence Strategy
ISIL	Islamic State of Iraq and the Levant
ISR	intelligence, surveillance and reconnaissance
NATO	North Atlantic Treaty Organization
NORAD	North American Aerospace Defence Command
operation	Op
RCAF	Royal Canadian Air Force
SAR	search and rescue
UA	unmanned aircraft
USAF	United States Air Force

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THE HALF- BUILT ROAD:





IMPLEMENTATION OF THE ROAD TO MENTAL READINESS TRAINING PROGRAMME IN THE RCAF

BY CAPTAIN CHANTAL BRIEN

Photo: DND

Editor's note: This paper was written by a candidate attending the Air Power Operations Course in fulfilment of one of the requirements of the course of studies.

INTRODUCTION

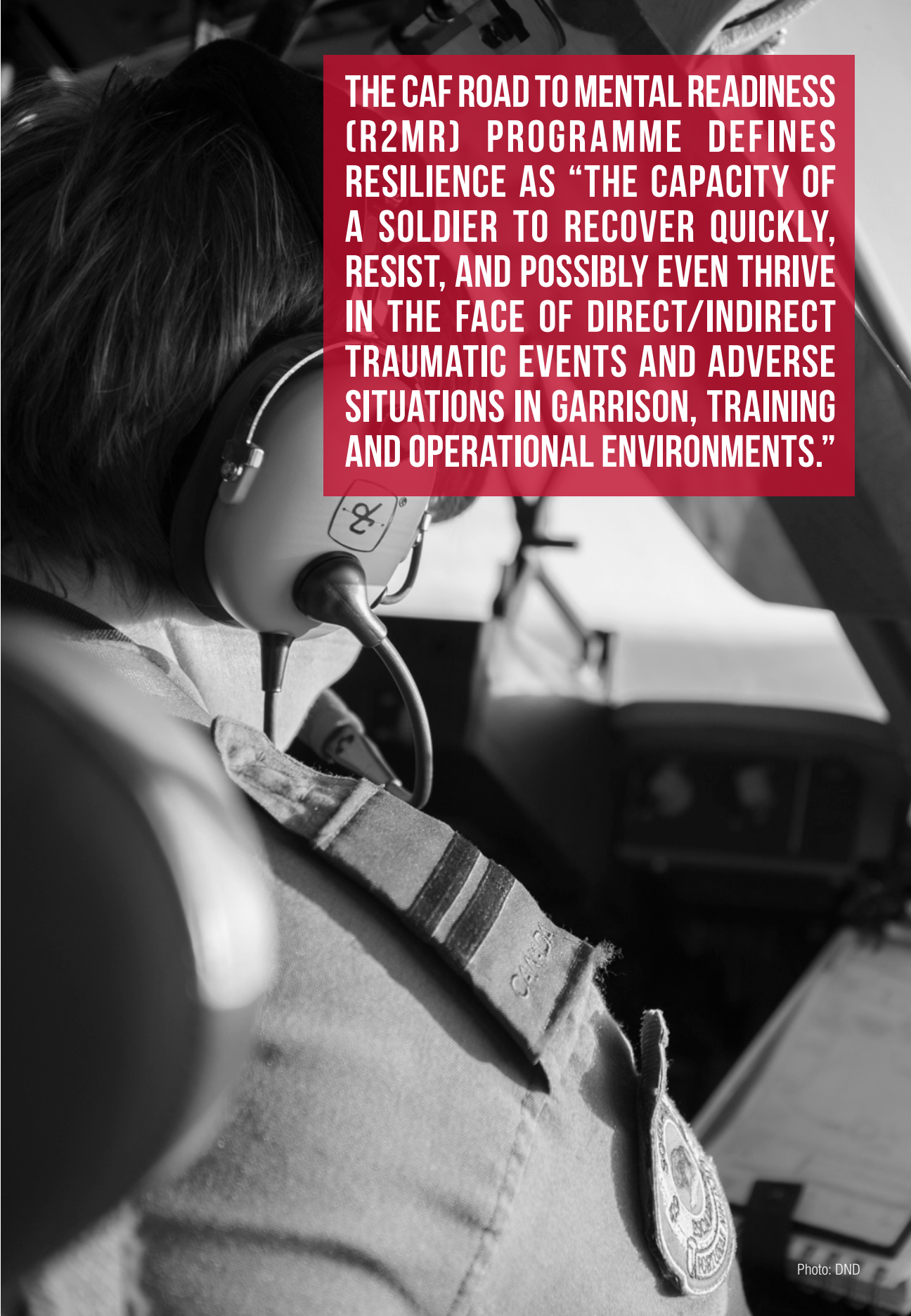
Imagine that during combat operations overseas, a Canadian Armed Forces (CAF) intelligence analyst observes what appears to be a small group of males carrying long stick-like objects approaching a friendly position. The analyst has a very short time in which to make several critical determinations. If it is assessed that the men being observed are enemy combatants, this could lead to friendly units using deadly force to prosecute these men as targets. If it is incorrectly assessed that they are hostile when they are not, the analyst may have just contributed to the deaths of innocent civilians. If it is incorrectly assessed that they are innocent and they are actually enemy combatants preparing for an engagement, they may kill or injure friendly troops. In such a case, the time pressure to produce a correct assessment is enormous, as are the consequences of error.

The pressures felt by the analyst in the scenario above are very realistic and are not confined to intelligence professionals. Many CAF members are placed in situations where they are asked to make life-or-death decisions repeatedly within very compressed time frames. Considerable time and resources are devoted to training members to perform their duties admirably. Indeed, the analyst in the scenario above would have been trained on patterns of life in the operating environment to enable an assessment of whether the group's activities conformed with expected societal norms. The analyst would have been trained to differentiate between a weapon and a benign tool. Given the breadth and quality of that training, if there was sufficient information available, one could reasonably expect that the analyst would make the correct determination. Based on that, it could be said that CAF has appropriately trained the analyst for this high-stress duty. Lessons learned from recent expeditionary air operations, however, might reveal otherwise.

While CAF has traditionally done a first-rate job of training its members to perform their jobs with technical excellence, this article will demonstrate that inadequate attention has been devoted to training members so that they are psychologically ready for their duties, particularly with regard to enhancing mental resilience. This will be accomplished by defining resiliency training and examining the current CAF resiliency training programme. The article will then analyse how well this training is being implemented, particularly for members not deploying as part of a large, formed unit. Finally, a proposal for future training will be outlined, with a focus on the Royal Canadian Air Force (RCAF) taking into account lessons learned from recent operations.

WHAT IS RESILIENCY TRAINING AND WHY DOES IT MATTER?

The CAF Road to Mental Readiness (R2MR) programme defines resilience as “the capacity of a soldier to recover quickly, resist, and possibly even thrive in the face of direct/indirect traumatic events and adverse situations in garrison, training and operational environments.”¹ Research has demonstrated that attitudes and behaviours that enhance resilience are a skill that can be taught;² this article will refer to programmes designed to teach these skills as resiliency training. Other military forces, such as the United States Army, have successfully adopted resiliency-training programmes by modifying previously existing programmes specifically for their military personnel. The United States Army studied their programme to determine its effectiveness. It found that “over the 15-month period, scores [measuring soldiers' psychological health] of the four BCTs [brigade combat teams] receiving the training were significantly higher than the others, irrespective of other variables, such as unit leadership and cohesion.”³ Although the programme in question has not been in effect long enough to provide comprehensive data regarding its long-term

A black and white photograph of a soldier wearing a headset, with a red text box overlaid on the right side. The soldier is wearing a military uniform with a patch on the sleeve. The background is blurred, showing what appears to be a vehicle interior.

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effects, soldiers who scored higher were also less likely to be diagnosed with a mental health or substance abuse problem. While absolute causality cannot be demonstrated, there does appear to be a positive association between soldiers at units where the resiliency-training programme has been implemented and, thus, improved psychological health. Additionally, there appears to be a further positive association between soldiers with improved psychological health and a reduced likelihood of a medical diagnosis correlated with operational stress injuries (OSIs).⁴

Reducing a military member's susceptibility to OSIs is very significant to the individual in question but also has a noticeable impact at the operational and strategic levels. At the operational level, reducing the number of deployed members who have to be medically repatriated back to Canada as a result of mental health issues enhances organizational effectiveness and reduces the burden on force generators. Within Canada, reducing the number of members struggling with OSIs would reduce the number of sick days taken, increase productivity of those at work and reduce attrition.⁵ At the strategic level, the Canadian public has shown itself to be strongly supportive of its military members. Stories about members wrestling with mental health issues have resonated deeply within Canadian society. If CAF is not shown to be actively engaging this problem, there is a very real risk of loss of organizational credibility and public support for the institution.

WHAT IS THE CURRENT RESILIENCY TRAINING CONSTRUCT?

Given the positive impact to both the individual and the institution, it is not surprising that CAF has developed a comprehensive resiliency-training programme, the previously referenced R2MR. This training is intended to be delivered throughout the career of every CAF member. Introductory modules are delivered during basic military training. These are focused on developing resilience at the individual level. Further modules, which are intended for junior leaders, focus on "mentoring and coaching resilience skills, application of mental health concepts to leadership and caring for subordinates."⁶ At the senior leadership level, "the focus is now on inculcating resilience and mental health training into the wider CAF training system and operations planning, as well as setting the appropriate command climate that positively shapes unit culture to promote resilience and reduces barriers to care."⁷ Resiliency training is also part of the individual battle task standard (IBTS) that all CAF members must achieve prior to each deployment. Finally, specialized training is offered, or is being developed, for military occupations that were recognized as having particular needs with regard to resiliency training. These include firefighters, medical personnel, military police and imagery analysts.⁸ The R2MR programme, as described above, is comprised of all the modules of resiliency training that CAF members are intended to receive.

HOW WELL IS THE RESILIENCY-TRAINING PROGRAMME IMPLEMENTED?

If one were to rely on the CAF's published information about resiliency training, one would probably form a very favourable impression of the programme as a whole. Nevertheless, lessons learned from recent operations suggest that the programme is not functioning as it should. In a 2012 briefing note, the 1 Canadian Air Division A2 revealed that 45 per cent of imagery analysts who were deployed to a particular operation indicated that they were experiencing symptoms of OSIs. This is much higher than the number that would be expected based on comparisons to historical rates of OSIs.⁹ Although published information is not available regarding total numbers of members medically repatriated from Operation IMPACT for mental health reasons, the author of this article is personally aware of several instances where this was required. The author is further aware of several additional cases where a member was not repatriated, even though they were

unable to perform as expected, due to stress beyond the member's ability to cope. While no resiliency-training programme could be expected to prevent all such instances, these statistics bring into question the effectiveness of R2MR.

Given the comprehensive scope of the outlined R2MR programme, the difficulties described above might come as a surprise. There are several contributing factors that could be responsible for the difference between what one might expect and the apparent results. While exploring all of these in detail is beyond the scope of this article, factors related to programme implementation timelines and suboptimal delivery methods will be explored in the paragraphs that follow.

Although the R2MR programme in its current iteration is quite comprehensive, it is a relatively new innovation, particularly to the RCAF. This means that many of the individuals being employed operationally would have completed their training before R2MR content was added. This is particularly true for junior officers in the Royal Canadian Navy (RCN) and RCAF, as their environmental professional-development programmes do not yet include R2MR content. While leadership and professional-development courses for non-commissioned members and junior officers in the Canadian Army (CA) currently include this content, there is no plan for members who had completed courses prior to the inclusion of this material to be offered learning opportunities to receive the R2MR content they have missed.¹⁰

While unequal implementation of R2MR training is one obstacle preventing RCAF members from receiving the intended benefits of the programme, this is not the only factor. Researchers studying the resiliency-training programme developed by the United States Army highlighted the importance of several factors that increased the programme's effectiveness. One of the identified factors was conducting training in formal sessions.¹¹ Although training is typically conducted in formal sessions when large groups are deploying together from a single base (as is frequently the case for the CA), this is often not the case for the RCAF, where augmentees are brought together from bases across Canada to fill individual positions. While formal sessions can be conducted for smaller groups, when the author of this article called the manager of the Mental Health Unit at 23 Health Services Centre in Winnipeg to inquire about how augmentees would go about scheduling pre-deployment R2MR training, she was informed that while exceptions can be made, the minimum preferred group size is six. In practice, what this means is that R2MR is frequently completed as an online self-study package for many deploying RCAF members. While online self-study is an appropriate delivery mechanism for some materials, when R2MR is completed this way, particularly when it is one of many courses completed via self-study in a compressed period of time, it is doubtful that the material will be retained by the member or that the average deploying member will view it as having been important.

Given the deficiencies identified above, it is not surprising that the R2MR programme is not achieving all of its desired effects. Indeed, it would be incredible for a programme that had not yet been fully implemented or has not been delivered effectively to achieve its desired ends. Fortunately, there are cost-effective solutions to these issues, as will be demonstrated in the following section.

WHAT CAN BE DONE TO AMELIORATE THE CURRENT SITUATION?

While progress is being made with regard to the R2MR programme, there is more that can be done to address the deficiencies identified above. One of the most obvious is to fully implement the programme as designed, particularly with regard to including R2MR training into the RCN and RCAF officer professional-development streams. While this may seem obvious,

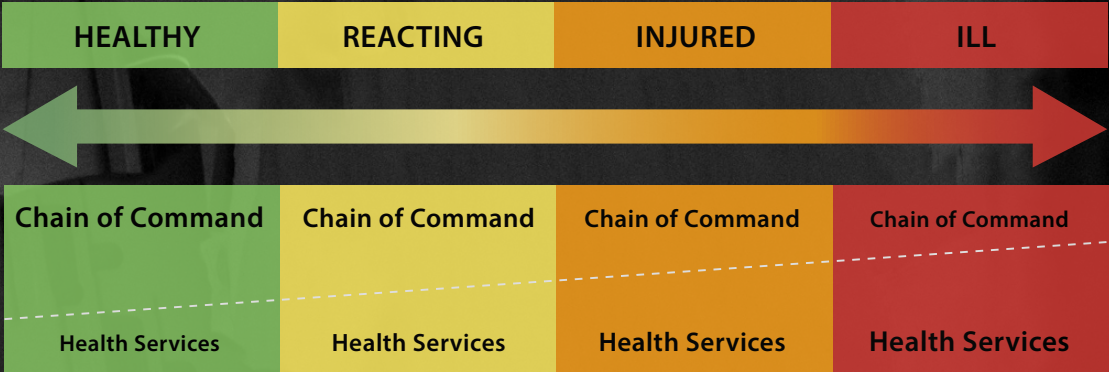
there is a great reluctance to include any additional material, particularly for junior officers. This particular developmental period is generally accepted as being quite full. Certainly, if one were to talk to a young RCAF captain who is currently trying to gain proficiency in a second language, while obtaining a graduate degree, in addition to completing self-study professional-development courses, while simultaneously developing their leadership skills, on top of performing their day-to-day duties, provided that they aren't too busy to do any of the above because they are deployed on an international operation, one would be likely to get fervent agreement that no additional tasks are required or welcome. That said, if CAF, and the RCAF in particular, is serious about equipping members to withstand the rigours of the tasks that are to be set before them, then resilience training needs to be seen as a priority. Currently, the RCAF does not devote a single training period to R2MR in either Air Force Officer Development Block Five (AFOD5) or the newly developed Air Power Operations Course (APOC), the two residential professional-development courses for junior officers in the RCAF.

While some might argue, correctly, that the curriculum for these courses is already quite full, there are ways to incorporate R2MR concepts into the professional-development streams without unduly impacting the course calendars. In AFOD5, there is already time allocated to syndicate discussions on leadership topics. As leaders at this level are expected to be able to mentor and coach resilience skills,¹² a homework reading with a scenario-based practical exercise or discussion in syndicates the following day would fit well with the material already being presented. Students on APOC conduct several practical exercises developing staff products; if the topic of one of these exercises were to be amended to cover R2MR material, students could gain further exposure to R2MR without increasing the workload on course. On some levels, this may actually be preferable to giving students the standard R2MR presentation, as it would force them to engage with the material as participants rather than receive a briefing passively. Although some creativity might be required to ensure that any additions to these courses would be opportunities for meaningful learning, objections on the basis of a full schedule are clearly surmountable.

While including R2MR in future professional-development training, similar to what the CA is already doing, will help better prepare RCAF members to manage stress at home, conducting pre-deployment R2MR training as the CA does may not be an ideal solution for the RCAF. As previously discussed, when deploying overseas, the CA typically trains and deploys as one large group, while the RCAF tends to fill individual positions from various wings. Additionally, the CA tends to deploy for approximately six-month blocks, while the RCAF varies tour lengths considerably, with deployments ranging from 56 days to 9 months. One solution that might accommodate such diverse requirements is to offer R2MR training on a set schedule, similar to what is done for first-aid and weapons-handling qualifications. This would allow augmentees from different bases to receive in-person training, instead of individuals merely clicking through the slides of an online package.

It could be argued that this would be less beneficial than the CA scheme of conducting R2MR training as a group prior to deploying. While there is some merit to this argument, as training as a team can help build cohesion prior to arrival in theatre, the RCAF's varied deployment rotation cycles would make this a complex endeavour. There are already systems in place that track currency of qualifications; they are well-understood and generally function satisfactorily. Additionally, this would give the RCAF flexibility to accommodate the training requirements for members deploying as replacements or out of synch with the larger rotations. Finally, this would allow for annual in-person training, as opposed to the occasional online training that currently exists.

While it has also been suggested that R2MR training could be included as part of the in-routine for groups arriving in operational theatres, this is not optimal for several reasons. The primary



THE MENTAL HEALTH CONTINUUM MODEL RECOGNIZES THE SPECTRUM OF HEALTH CONCERNS, BE THEY MENTAL OR PHYSICAL, THAT MAY IMPACT CAF MEMBERS DURING THEIR CAREERS.

SOURCE: DIRECTORATE OF MENTAL HEALTH - ADAPTED FROM THE US MARINE CORPS



reason being that members are often jet lagged, adjusting to a new climate and being bombarded with a lot of other information; conducting training immediately upon arrival in theatre virtually guarantees that very little of the material presented will be retained unless it is of immediate use to the trainee. If training is conducted overseas, it should be in the form of leaders teaching by example, particularly by positively demonstrating resiliency principles in their own conduct and by engaging thoughtfully with subordinates.

The value of leadership driving change in this area cannot be overstated. Although solutions are available to improve the current level of R2MR training in the RCAF, these are unlikely to occur without senior leaders making it known that R2MR is a priority. Given the RCAF's experience on recent expeditionary operations, one can only hope that increased emphasis will be placed on resiliency training in the future.

CONCLUSION

Lessons learned from recent expeditionary operations demonstrate that there are gaps in the preparedness of RCAF members in terms of resiliency training. This is a key deficiency, as resiliency training has been demonstrated to be positively associated with increases in psychological health measures that are further positively associated with a reduction in OSIs. While CAF has invested a great deal of effort in developing a resiliency-training programme, the RCAF currently lags behind in implementing all aspects of R2MR, particularly with regard to its inclusion in junior officers' professional development. This could be ameliorated by including R2MR training in professional-development courses that already exist and by offering regular training at wings as part of both annual and pre-deployment training. While there would likely be some challenges associated with implementation, this would help increase productivity, reduce injuries and improve attrition rates, thereby enhancing the RCAF's operational effectiveness. It would be unthinkable to knowingly deploy the analyst in the opening vignette without the equipment required to keep them safe if that equipment was available; it should be equally unthinkable to require RCAF members to deploy without the necessary training to protect them from the psychological rigours of their duties.

Captain Chantal Brien, an intelligence officer, is currently posted to 1 Canadian Air Division Headquarters. Her previous postings include the Canadian Forces Joint Headquarters and the Canadian Forces School of Military Intelligence. She deployed to Afghanistan in 2009, Haiti in 2010 and Qatar in 2015. Captain Brien holds a Bachelor of Science (Honours) in Space Science as well as Military and Strategic Studies from the Royal Military College of Canada and is currently working towards a master of arts in Religious Studies from Domuni University.

ABBREVIATIONS

AFOD5	Air Force Officer Development Block Five
APOC	Air Power Operations Course
CA	Canadian Army
CAF	Canadian Armed Forces
OSI	operational stress injury
R2MR	Road to Mental Readiness
RCAF	Royal Canadian Air Force
RCN	Royal Canadian Navy

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12. "Career Cycle."

SUGGESTED IMPROVEMENTS FOR RCAF MAJOR PROCUREMENTS

BY CAPTAIN JONATHAN BRIÈRE, CD, MENG

Photo: DND

Editor's note: This paper was written by a candidate attending the Air Power Operations Course in fulfilment of one of the requirements of the course of studies.

AIM

The aim of this article is to outline some of the major issues that defence procurement, specific to the Royal Canadian Air Force (RCAF), is currently facing with respect to expedient acquisition congruent with the ability to keep pace with the rapid changes in aerospace technologies. It will also outline some possible process changes that may accelerate the overall procurement cycle.

INTRODUCTION

Canada's defence-procurement framework, specifically as it pertains to major capital acquisitions, is a complex beast that has proven time and again to be inefficient and ineffective. Although many Canadians are arguably ambivalent about defence issues, major defence acquisitions are highly scrutinized and politicized. The average procurement cycle, from project initiation to close out, has risen to 16.5 years in 2011.¹ Defence-procurement strategy must be forward looking by nature, and it is difficult to procure today what will meet the needs of tomorrow. Further compounding this difficulty is the lengthy procurement cycle. Canada's low overall investment in defence also requires planners to take into account the longevity of, and multiple employment areas for, the capabilities procured. These realities combined with the rapid pace of technological change in air and space systems mean that the RCAF cannot reasonably expect to keep pace and remain relevant without a more effective procurement system.

This article will review the current procurement philosophy, outline areas that are not likely to change within the Canadian context and propose changes to governance that could improve the overall responsiveness and effectiveness of the Canadian procurement system as a whole. Such changes would improve Canada's ability to adapt to rapid technological changes that specifically impact RCAF capabilities.

Thesis statement. The consolidation of the current multi-departmental approach to defence procurement under a single authority would permit the creation of efficiencies to improve procurement timeliness, thereby remaining more responsive and better keeping pace with consistent changes to existing technologies, an area of specific concern to the RCAF.

CANADA'S CURRENT DEFENCE PROCUREMENT STRATEGY

The most recent serious attempt to respond to the challenges defence procurement is facing in Canada came in the form of Canada's Defence Procurement Strategy, released in February 2014.² The main highlights include a more focused involvement in the Canadian defence industrial base and moving away from the arms-length approach to procurement (but without crossing the line of unbiased selection).³ This takes the form of a restructured framework to establish closer ties with the Canadian regional defence industries.⁴ The previous Industrial and Regional Benefits (IRB) Policy, in effect since 1986, is now transformed into the Industrial and Technological Benefits (ITBs) Policy. The goal remains the same: funneling investment towards Canada's defence industrial base. The difference is the more rigid requirements that are now in force. Bids are now weighted with 10 per cent overall consideration given to reinvestment into Canadian key industrial capabilities.⁵ Procurement contracts valued at \$100M or more now require a comprehensive ITB investment plan.⁶ Finally, a requirement remains for all plans to include reinvestment of work back into Canada equivalent to 100 per cent of the value of major procurements.⁷ ITBs implemented in this way may even serve to exacerbate the issue by forcing more business towards an industry with insufficient capacity to deliver in scale.

Little else has changed when comparing the old policy to the new framework. The Canadian defence-procurement system remains a complex bureaucracy with several government departments and agencies involved. All, by nature, have competing mandates, responsibilities and accountabilities. Public Services and Procurement Canada (PSPC) is the government's central procurement organization. It is also the entity with the exclusive authority to purchase defence products on behalf of the Department of National Defence (DND). DND is responsible, in turn, to define the requirements for procurement initiatives.⁸

Several other government agencies are also key stakeholders in the procurement process. Industry Canada (IC) administers the ITBs programme.⁹ The Treasury Board is responsible for the overall procurement policies within the Government of Canada (GoC) and is the preliminary funding authority of all major capital acquisitions. Other government agencies—including the Privy Council Office; Finance Canada; Fisheries and Oceans Canada; and Foreign Affairs, Trade and Development Canada (FATDC)—are also included in different stages of the procurement process.¹⁰ An independent analysis in 2006 concluded that these departmental redundancies may account for between \$4.8M to \$125M per annum.¹¹

This multi-departmental approach means that no one minister is truly in charge of the overall defence-procurement process. However, the February 2014 policy change created a Defence Procurement Secretariat within PSPC that reports to the Deputy Ministers Governance Committee. This committee is chaired by PSPC with deputy ministers from DND, IC, FATDC as well as Fisheries and Oceans Canada.

The practical impact of Canada's 2014 Defence Procurement Strategy will be difficult to quantify until more time has passed. However, this article will attempt to look critically at the ability of this "new" policy to adapt to rapid technological changes of concern to the RCAF.

POLICY CONSTRAINTS ASSUMED

Certain elements of defence-procurement policy are assessed, for the purposes of this article, as immovable. They include authority for expenditure, budget, overall procurement authorities, political involvement and the ITBs policy.

Expenditure authority. Within Canada, once the procurement is accepted by Cabinet, preliminary funding for major capital projects must first be approved by the Treasury Board of Canada Secretariat.¹² This is also the case for major expenditures within other government departments. Although it can be argued that DND's direct and independent control of defence monies could lead to substantial saving in the time and effort associated with major procurements, this governance is unlikely to change for DND and will be assumed as constant.

Budget. Canada's defence budget is relatively low, amounting to 0.99 per cent of the national gross domestic product (GDP) and ranking Canada 23rd among 28 North Atlantic Treaty Organization (NATO) countries.¹³ Additional spending in an attempt to deal with the procurement problem, either directly or indirectly, is unlikely to occur.

Procurement authority. It is assumed that PSPC will remain the principal procurement authority for all GoC departments, including DND. While their personnel footprint could range from the imbedded few employees that currently exist within project management offices or grow to something more substantial, their consistent involvement within defence projects is a required reality.

Political involvement. Arguably, the Canadian voting base is not overly concerned with defence issues. Nonetheless, direct political involvement consistently and directly impacts on defence major capital acquisitions. From an RCAF perspective, we need not look much further than the highly politicized Sea King replacement and Joint Strike Fighter projects in recent history to see how government intervention and lengthy wait times for decisions have caused significant delays, internal to the procurement process.

ITBs. The regional benefits programmes, now billed ITBs, can be considered a political constant. The imperative, from this perspective, to funnel funding and business to the Canadian industrial base (no matter how small and despite the obvious contradiction with the concept of a competitive free market benefiting the client) is a consistent reality.

MEASURES TO ADDRESS CANADA'S MILITARY PROCUREMENT SHORTFALLS

The RCAF does not possess the monopoly on problematic procurement. For example, the Royal Canadian Navy's Joint Support Ships and Canadian Surface Combatant programmes have also suffered from significant delay and scrutiny. However, this seems to be the norm with RCAF major acquisitions. Even those programmes that were billed as successes, such as the CC177 and CH147, came with a legacy of cost overruns as well as support and sustainment issues that should have been more appropriately addressed by procurement authorities.¹⁴ A correlation appears to exist between cost, complexity and the level of difficulties in administering procurement. To this end, the successful reform of the business of procurement within Canada as a whole will be more directly visible through the technologically sensitive RCAF acquisition initiatives. No single measure of reform will address all issues associated with defence procurement and, specifically, major crown acquisitions. However, measures can be taken to improve Canadian military procurement that will ultimately benefit the complex acquisitions required by the RCAF.

The change mechanisms proposed are not meant to dictate a specific solution to this complex problem but, rather, to identify target areas for improvement. The exact incarnation of a final solution is a point of debate. Significant reform does, however, require significant change.

SINGLE GOVERNANCE

Canada maintains an overly complex procurement structure. Despite the fact that PSPC is the named procurement authority for the GoC, in practice, multiple departments share responsibility for the management of and decision making for defence procurements. In the United States, the Secretary of Defense is accountable for military procurement. Similarly, the United Kingdom (UK) vests procurement responsibility to the UK Secretary of State for Defence. Australia also holds this responsibility within its Defence Materiel Organisation, accountable to the Minister of Defence.¹⁵ However, as previously stated, it seems a foregone conclusion in the Canadian context that the responsibility for major defence procurement remains outside of the direct control of DND.

Despite the relatively low investment into defence, Canada falls consistently short of spending its allotted budget. In 2016 alone, \$3.7B of allotted procurement monies were carried forward to future years. Over the last six years, more than \$10B has been deferred in this fashion.¹⁶ This backlog is indicative of both the current requirement to invest heavily into a rusted-out department from a generation past but also of an overly complex management framework that consistently fails to manage the expenditure of all available funds.¹⁷

A proposed improvement could be the amalgamation of procurement responsibilities under a single minister and within a single department. The Canadian solution could look similar to that of the allies previously mentioned, an Assistant Deputy Minister (Procurement) under the Defence Minister for example. Given the requirement under the Defence Production Act for PSPC to remain the exclusive purchasing authority for defence products, representation for this department will be required within DND to create procurement plans, solicit and evaluate bids as well as let and administer contracts.

The final incarnation is a matter of some debate, but the driving factor is that overall responsibility, and by extension accountability, resides within a single ministry.

ADDITIONAL PROCUREMENT SPECIALISTS

Another shortfall of the current defence-procurement solution is the lack of specialized training and institutional knowledge of procurement activities within DND. This issue is pan-environment and negatively affects the efficient performance of project management offices. Our United States allies have a dedicated contract specialty within their military organization. Conversely, Canada relies on a combination of some just-in-time formal training and employment experience to build contracting and procurement expertise.

The involvement of DND technical experts within the acquisition machine is a requirement to adequately define system requirements and concepts of operation for new major crown acquisitions. Military personnel are also heavily relied upon within project management offices to perform acquisition functions from project initiation to close out. Civilians and contractors employed by the government also exercise technical functions within Assistant Deputy Minister (Materiel). Very few personnel, save the relatively small PSPC representation shared between several major acquisitions at one time, are specialists in the procurement process.

The problem is further exacerbated by the fact that the majority of project management positions are filled by uniformed personnel who have a high turnover rate. As a result, new military members are required to undertake formal and exposure training in order to be effective in their procurement role. The current staffing model of building subject matter experts into acquisition roles means that relatively little core procurement expertise is present.

Although the specific solution could arguably take different incarnations, the end state required to address the shortfall with respect to procurement specialists ultimately requires more individuals capable of performing core procurement functions at a high level. Additional PSPC staff is one solution but will require a marked increase of current personnel dedicated to all major crown initiatives. Another potential solution is to create procurement specialists as an administrative military occupational structure identification (MOS ID) of DND. These individuals could be either military or civilian. Procurement expertise could, therefore, be deliberately managed from within the department that has the largest stake in the efficient management of defence procurement.

PERFORMANCE MEASURES

If a thing cannot be measured then it also cannot be deliberately and systematically improved. It also becomes impossible to effectively determine performance-measurement criteria if multiple stakeholders are concerned with different indicators of the procurement process. As a result, the implementation of adequate performance metrics in order to realize a system of continuous improvement requires a single point of governance. Therefore, the recommendations are: that procurement resides under a single ministerial authority and that specific and measurable procurement criteria are established.



IF A THING CANNOT BE MEASURED THEN IT ALSO CANNOT BE DELIBERATELY AND SYSTEMATICALLY IMPROVED. IT ALSO BECOMES IMPOSSIBLE TO EFFECTIVELY DETERMINE PERFORMANCE-MEASUREMENT CRITERIA IF MULTIPLE STAKEHOLDERS ARE CONCERNED WITH DIFFERENT INDICATORS OF THE PROCUREMENT PROCESS.

Assuming the implementation of these inherently linked recommendations, the most adequate way to measure procurement success remains a point of debate. In the case of sensitivity of rapidly changing technology, speed of procurement is the most important factor.¹⁸ When assessing financial accountability, value for money is of chief importance.¹⁹ However, a good rapidly procured at low cost could easily fail to meet the need. Similarly when assessing cradle-to-grave procurement, global system-wide measures are more likely the appropriate answer. We must also be cautious not to impede procurement with excessively complex and redundant performance measures. The correct balance of measuring performance and delivering effect will be difficult to achieve.

At a minimum, the two broad metrics of success—time and cost—should be broken in more discreet pieces. One solution is to look at delays in terms of responsibility: external approvals, internal delays, contractor delays, delays due to change in scope, delays due to technological variance over the procurement process, etc. These would all need to be adequately defined and weighted to determine trend data.²⁰ Similarly, cost metrics should be assessed for overall value, cost variances due to predictable and unforecasted factors, increased cost as a function of time, etc.

Collecting information is one step, but it becomes inconsequential without a mechanism for change. A single governing body with a direct scope of influence could then action a change-management process to yield positive and quantifiable outcomes; successes and failures could then be determined using this same trend data in future years.

However, the implied requirement is a solid commitment to the practice of change management. Appropriate scope and authority for this function is also critical. Too often we will fail to see changes that could result in a positive end state through to completion. Failure to appropriately staff and prioritize such an initiative is akin to never attempting its implementation in the first place.

PRE-APPROVED ACQUISITION PLAN

The Canadian military, and by extension the RCAF, currently suffers from the lack of a Cabinet-approved, long-term capital defence plan for spending.²¹ Military spending and, more importantly, procurement approval require Cabinet and Treasury Board approvals within a given year. There is no long-term approval process currently in place for defence-procurement initiatives. On the surface, the most recent pseudo-white paper from 2008 appeared to outline defence acquisition priorities and total yearly budget expectations. However, the portion of the budget specifically dedicated to defence spending was not outlined nor was this document ever intended to secure approval for major crown acquisitions. No attempts have been specifically undertaken to address this issue. The creation of a pre-approved and multi-year defence-procurement programme is an arguable necessity to ensure that allocated monies are both sufficiently utilized and prevented from being carried forward to future years.

Defence procurement has suffered from perpetual uncertainty. Requirements for military spending are determined too late in the life cycle of current equipment, and this issue is further compounded by extremely long project definition and initiation timelines. In the RCAF context, technological leaps from one generation to the next are possible even before contract award. As well, this incubation period combined with the highly scrutinized and politicized nature of major defence acquisitions can easily lead to further delays and outright cancellations. The fact that procurement timelines now average in excess of 16 years means not only that technologies are expected to progress substantially over that period of time but also that multiple government terms will occur, creating many political opportunities to engage in defence-procurement decisions.

With the concepts of better involvement and communication with the Canadian defence industrial base in mind, a longer-term spending plan would allow defence firms to better position themselves and compete in future years.²² A competitive advantage within the Canadian defence industrial base is of obvious interest to IC and government as a whole. The irony is that the current defence-spending approval process all but creates adequate conditions to meet these objectives.

Another benefit to a longer-term spending plan over a multiple-year horizon is that government would be in a much more difficult position to defend the review or cancellation of well-known and justified defence requirements. It would ensure greater visibility into the future loss of defence capabilities, allowing us to plan for and to limit the development of capability gaps.

Also, any additional funding required to complete procurement activities, no matter how well justified, must undergo Treasury Board approvals prior to any action being taken. The implementation of a longer-term defence-spending plan would ensure that sufficient funds and appropriate contingencies are available to see a plan through to completion.

CONCLUSION

The RCAF has long been plagued with procurement issues for major acquisitions that are inefficient at best but are also often ineffective. There is no shortage of cautionary tales in recent history that highlight the significance of this issue. Sensitivity to rapidly progressing technology (which is a major issue for the RCAF) can only be mitigated by a dramatic reduction in procurement-cycle timelines. In a political and policy-driven environment, this means a fundamental shift in the defence-procurement cycle within Canada. The RCAF will only benefit from a macro-level paradigm change.

Previous initiatives have been undertaken in an attempt to address the issue; most recently, it was the 2014 Defence Procurement Strategy. It is far too early to deem this a success or failure; however, the only major change is centred on forcing more business to Canadian industry through the ITBs. While the concept of forcing more business into the Canadian industrial base may be a politically agreeable solution, it in no way addresses the root cause of cost overruns and procurement delays.

This article has assumed a number of constants that are likely to survive any procurement change initiatives. Within this bounded solution set, some change direction is proposed. First, vesting the authority and accountability for defence procurement under a single minister would align priorities and improve further governance and change (this concept is similar to processes already in use by many close allies). Second, develop employees with the specific training and expertise to manage procurement. Third, implement specific and measurable criteria that will precisely identify issues and ensure the ability to assess the effectiveness of any future changes. Finally, create a longer-term approval framework for defence spending that will lend some certainty and predictability to the process.

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ABBREVIATIONS

DND	Department of National Defence
FATDC	Foreign Affairs, Trade and Development Canada
GoC	Government of Canada
IC	Industry Canada
ITB	Industrial and Technological Benefit
MOS ID	military occupational structure identification
PSPC	Public Services and Procurement Canada
RCAF	Royal Canadian Air Force
UK	United Kingdom

NOTES

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Photo: DND



USING **KAPLAN'S BALANCED SCORECARD** TO MEASURE RCAF PERFORMANCE

BY MAJOR JAMIE WILSON

Editor's note: This paper was written by a candidate attending the Air Power Operations Course in fulfilment of one of the requirements of the course of studies.

AIM

The aim of this article is to discuss and recommend a solution to the Commander (Comd) Royal Canadian Air Force (RCAF) with regard to, "How should the RCAF measure its performance against stated goals and objectives? Recommend a performance-measurement framework."¹ This question is of significance as it is a part of the 2016 AIRPower Research List which is used to improve air power organizational management.

INTRODUCTION

Like any leader of a successful organization (whether it be military, government or industry), Comd RCAF has established a strategic vision, mission and objectives (referred to as goals / end state—see Comd RCAF Flight Plan on page 53).² The establishment of this guidance informs all members of the RCAF about the direction the organization will go in the future, about the organization's role and on how the organization will fulfil its role. To accomplish organizational goals, Comd RCAF established the following overarching guidance:³

- a. **RCAF vision.** An agile and integrated air force with the reach and power (AIRPower) essential to Canadian Armed Forces (CAF) operations.
- b. **RCAF mission.** The RCAF will provide CAF with relevant, responsive and effective air power to meet the defence challenges of today and into the future.
- c. **Commander RCAF goals / end state.**

In order to achieve our vision we must fly the correct **APPROACH**:

1. Airworthiness and effective risk management the norm, based on a successful safety programme.
2. Professional AIRPower mastery and air power mindedness enhanced.
3. Persistent delivery of high-calibre air power assured.
4. Reputation and credibility enhanced within CAF, the Department of National Defence and across government.
5. Optimize Air Force strategic framework institutionalized, resulting in improved RCAF institutional discipline and accountability.
6. AIRPower improved, by criteria, in a measurable way.
7. Collaboration, coordination and integration as a cultural mindset, leading to improved effectiveness and greater strategic and institutional influence.
8. History and heritage integrated as core business.

In order to determine if the RCAF is working effectively towards its vision and mission, the ability to meet its objectives will indicate whether it is successful. In order to evaluate if efforts are successfully working towards objectives, performance needs to be measured. Currently, there are no clear measures in place to determine exactly how well the RCAF is performing with respect to the objectives directed by the Comd RCAF.

In order to properly measure performance, Kaplan's Balanced Scorecard (BSC) will be aligned with the RCAF's objectives to indicate how well Comd RCAF's intent is being met and where improvement is necessary. To display the applicability and benefits of using the BSC to measure performance in the RCAF, the following will be analysed: Kaplan's BSC theory as well as successful applications in industry and other air forces. Finally, example BSC performance measures for the RCAF will be proposed.

KAPLAN'S BALANCED SCORECARD

The BSC is a concept that was developed and introduced by Robert Kaplan and David Nolan in the 1990s. The purpose of the system is to enable organizations to measure both tangible and intangible performance.⁴ The inspiration to track and quantify intangible performance was from Lord Kelvin, a 19th century scientist who believed "that when you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind."⁵ Implementing the BSC enables organizational managers to measure, describe, communicate and implement strategy across their organization. This concept of performance measurement allows for continued translation of tangible performance into short-term planning and the additional ability of medium- and long-term planning by measuring the intangible performance.⁶

In order to create and employ effective, meaningful BSC performance measures, requirements have been established. BSC performance measures must consist of the following:

- a. **Objective alignment.** Effective performance measures are to be aligned with organizational objectives.⁷ To ensure that the organization's mission and vision are being properly managed, all objectives must have effective performance measures assigned to track performance. It is also possible that an objective will have multiple performance measures assigned to it, as objectives can be complex and require several factors to be measured.
- b. **Targets.** Predetermined targets are necessary to determine what performance measures are indicating.⁸ A stoplight system is often used where green indicates that the standard is being exceeded; yellow indicates that the standard is being met but by a small margin, and red indicates that performance in the area is below standard. To be effective, attainable targets must be established.
- c. **Initiatives.** If change or improvement is required, initiatives must be put in place to ensure that effective advancement of required projects is occurring.⁹
- d. **Ownership.** Each performance measure should be assigned to one member who monitors its relevancy, ensures it has proper targets and ensures that proper steps are taken if improvements are needed.¹⁰

A common issue with using performance metrics is that it is often not clear why they are being tracked and what their added value is. If a performance measure is being tracked and it is not directly related to an objective, then there is one of two issues. The metric either has no added value (as it does not provide any relevant data towards objectives) or the objectives are not aligned with what is necessary to meet the organization's mission and vision.

In order to ensure that an organization is employing an effective strategy that will enable short-, medium- and long-term success through effective planning and tracking, it is recommended that the BSC is divided into four categories. The following are the recommended categories,¹¹ along with guidance on what their respective measures should provide and examples of what can be measured to meet their intent:

- a. **Financial.** To succeed financially, how should we appear to our shareholders? They are tangible measures that can assess profits, sales, market growth, etc.
- b. **Customer.** To achieve our vision, how should we appear to our customer? These are intangible measures that can actively and/or passively gauge customer satisfaction.
- c. **Internal business process.** To satisfy our stakeholders and customers, at what business processes must we excel?
- d. **Learning and growth.** To measure our vision, how will we sustain our ability to change and improve? There are tangible or intangible measures that can track the organization's ability to grow the necessary competent workforce, ability to retain and grow corporate knowledge, etc.

The BSC is a top-down approach, where the mission, vision and objectives are established by an organization's top leadership. In order for an organization to be effective, it is crucial that its strategy is reflected down the organizational chain. It is possible that further down the chain of an organization, other missions, visions and objectives exist, but this should only be the case if they feed the organization's overall strategy. In the most efficient and effective organizations, all members are aware of which objectives their work is contributing to and if their work is not contributing to objectives, the validity of the task should be evaluated. To codify the process of how strategy moves through an organization with BSC, Kaplan developed the following principles:¹²

- a. Develop strategy and mobilize change through executive leadership.
- b. Translate the strategy.
- c. Align the organization to the strategy.
- d. Motivate employees to make strategy their everyday job.
- e. Monitor, test and adapt the strategy continually.

SUCCESSFUL APPLICATIONS IN INDUSTRY

Since the introduction of Kaplan's BSC concept, thousands of companies have employed the concept with success, improving the efficiency, effectiveness and visibility of business processes. In order to display the effectiveness that is achievable with the concept, the success seen by organizations will be analysed. Although applying the BSC to the Comd RCAF's strategy will be different than those applied to profit-driven industry, it will not be unique, as several militaries worldwide have successfully employed the BSC.



THE RCAF'S GREAT CHALLENGES ARE DISSEMINATING ITS STRATEGY THROUGH A LARGE ORGANIZATION, MEASURING PERFORMANCE OF INTANGIBLES AND MAINTAINING CONSISTENCY THROUGH A CONSTANT TURNOVER IN LEADERSHIP.

An excellent example of the potential success of the BSC can be taken from the benefits reaped by fossil-fuel company Mobil. The success of Mobil's BSC implementation in the 1990s is applicable to the RCAF because Mobil was relatively similar in size to today's RCAF and the majority of Mobil's benefits were for reasons other than profit.¹³

On arrival of a new chief executive officer (CEO), the BSC concept was implemented because of a lack of a clear organizational strategy. The BSC was not used to create a new strategy for Mobil but was used to amalgamate several projects that were being used to measure and track performance and to clarify the company's strategy. The proper use of the BSC evaluated how the organization was operating and pointed out problem areas and ongoing successes. The CEO made the BSC successful by continually promoting it to all levels of the company and constantly emphasizing the need for an aligned organization, from top to bottom. As a leader, the CEO set a positive example on how the company had changed direction with the BSC. In the infancy of the concept during a quarter with great losses, no major changes were made because of the poor tangible financial results, but positivity was reinforced through the organization, as the intangible measures that had been implemented had shown positive results and progress in the other three BSC categories.¹⁴

Over the first five years that the BSC was utilized by Mobil, great progress was shown in all four categories. With 80 per cent of the company aware of its strategy and continuous improvement through the BSC, Mobil was able to lower refining costs by 20 per cent, yield losses by 70 per cent, serious safety incidents by 80 per cent and environmental incidents by 63 per cent; furthermore, customer-surveyed satisfaction grew annually. These results are even more impressive since there was a change in CEO over this period, proving that with an effective and communicated strategy (the result of using the BSC), an organization can remain stable and sustainable through transition.¹⁵

The takeaway for the RCAF from the success shown by Mobil is that the BSC not only is effective in measuring an organization's performance but also enables continuous improvement when implemented properly. The RCAF's great challenges are disseminating its strategy through a large organization, measuring performance of intangibles and maintaining consistency through a constant turnover in leadership. Mobil's use of the BSC showed that they were able to disseminate their strategy (and its impact on day-to-day operations) throughout a company of nearly 10,000 employees, measure intangible performance to quantify where improvements could be made and seamlessly transition between leadership while maintaining control of their strategy.

SUCCESSFUL APPLICATIONS IN OTHER AIR FORCES

To give further confidence in the validity of using the BSC to measure and monitor the implementation of Comd RCAF's strategy, it is important to analyse successes of its implementation in other militaries. Several North Atlantic Treaty Organization (NATO) allies including the United States, Norway and the United Kingdom have had success with the BSC. To evaluate the potential success of implementing the BSC in the RCAF, the Royal Norwegian Air Force's (RNoAF's) and the Royal Air Force's (RAF's) implementation of the BSC to overcome the challenges associated with drastic change and to improve efficiency in operations, training and spending will be analysed.

RNoAF

In 2000, the appointment of a new RNoAF Chief of the Air Force, Major General Tomas Colin Archer, coincided with the RNoAF's change in strategic and operational direction from Cold War—capabilities to a flexible force capable of combating terrorism and other smaller international crises.¹⁶ In order to make the changes necessary to the RNoAF, Archer employed Kaplan's five principles to develop and implement a new strategy. Using the BSC to measure performance

and provide key indications of attainable improvement, the RNoAF was able to increase flight hours by 40 per cent and training by 50 per cent. These improvements allowed the RNoAF to once again achieve the appropriate readiness standard required by NATO, while maintaining the same budget as pre-BSC.¹⁷

If the RCAF were to implement the BSC, several lessons can be learned from the RNoAF, as several parallels can be drawn between the two organizations. As a NATO ally, Canada has similar strategic responsibilities and carries out similar operations. Both countries share the same challenges with respect to the constant need to expand requirements with either no increase or a reduction in budget. Canada has also been struggling with the training requirement for meeting the established manning of trained pilots throughout the air force. The RNoAF is proof that the BSC can be applied to an air force similar to the RCAF and successfully enable the organization to measure performance and allow for the continuous improvement of the force's ability to meet its strategic objectives.

RAF

Like private industry, the RAF was mandated by the Ministry of Defence to enhance performance and find efficiencies. In order to do so, the BSC was adopted.¹⁸ Analysis of the implementation of the BSC by the RAF provides insight into possible performance measures and categories of measures that the RCAF can use. The RAF acknowledged that there was benefit to adopting the BSC concept in order to improve their operations and to align the strategic goals throughout their organization. However, due to the uniqueness of military operations, adjustments to the original BSC concept were necessary.¹⁹ For example, the RAF established its scorecard using outputs, processes/enablers, resources and future capabilities as categories instead of financial, customer, internal business processes and learning/growth. The adjustment allowed for leadership to better group crucial performance information, allowing for ease of problem solving. A primary objective of the RAF, and most militaries, is force readiness. Several performance measures were created to track this objective to include the readiness of personnel, organizations, equipment, training, logistics, infrastructure, information, doctrine and concepts.²⁰ Once again, the BSC was specifically tailored to allow for in-depth analysis of crucial aspects of the organization to permit maximal exploitation of available data and a more detailed performance assessment of the organization.

The work done by the RAF provides tremendous benefit to the RCAF, as they have done a significant amount of work to tailor their BSC in order to support a military strategy. This customization for a wide span of control displays the benefit that RCAF leaders can obtain in order to make crucial decisions with reliable information from all members of the organization who are well aware of the organization's strategic objectives.

EXAMPLE BSC PERFORMANCE MEASURES

Using the BSC theory and the lessons learned from the successful use of the BSC within industry and the military, examples of performance measures to evaluate the RCAF's performance will be developed. As indicated previously, Comd RCAF has already developed a strategy that includes a vision, mission and objectives. The following are sample BSC performance measures that could be used to evaluate Comd RCAF's strategic objectives. Two tangible and two intangible examples are provided:

- a. Airworthiness and effective risk management the norm, based on a successful safety programme:

1. **Tangible performance measure.** Average number per fleet of high / extremely high airworthiness risks assessed in Record of Airworthiness Risk Management (RARM) older than one year.
 2. **Target.** Green – 0.25, amber – 0.5, red – 1;
 3. **BSC category.** Customer;
 4. **Initiative.** Maintenance resources focused on rectifying known airworthiness risks in order to ensure an acceptable level of safety for all RCAF operations; and
 5. **Owner.** Director General Aerospace Equipment Program Management.
- b. Professional AIRPower mastery and AIRPower mindedness enhanced:
1. **Intangible performance measure.** Percentage of RCAF members who received AIRPower-themed training at their current rank level;
 2. **Target.** Green – 60 per cent, amber – 30 per cent, red – 15 per cent;
 3. **BSC category.** Learning and growth;
 4. **Initiative.** Continual promotion, development and formal delivery of lessons on AIRPower mindedness at all ranks to ensure AIRPower mastery can be achieved by all RCAF members; and
 5. **Owner.** Comd 2 Canadian Air Division.
- c. Persistent delivery of high-calibre air power assured:
1. **Tangible performance measure.** Percentage of required force-employment sorties provided to Canadian Joint Operations Command;
 2. **Target.** Green – 99 per cent, amber – 97 per cent, red – 95 per cent;
 3. **BSC category.** Customer;
 4. **Initiative.** Management Readiness Plan for contingency and deliberate operations; and
 5. **Owner.** Comd 1 Canadian Air Division.
- d. History and heritage integrated as a core business:
1. **Intangible performance measure.** Percentage of quality process amendments that evaluated the applicability of established lessons learned;
 2. **Target.** Green – 90 per cent, amber – 85 per cent, red – 80 per cent;
 3. **BSC category.** Internal business process;
 4. **Initiative.** Revamp the AF9000 quality requirements within the Air Force to require Canadian Forces Aerospace Warfare Centre–managed lessons learned to be reviewed when updating/creating quality procedures; and
 5. **Owner.** Canadian Forces Aerospace Warfare Centre.

These examples of tangible and intangible performance measures can be used to quantify the organization's ability to meet strategic objectives. These examples only cover a small portion of the

measures that are required to analyse the specific objectives. Input and alignment from all levels of the organization are necessary to create and maintain a useful BSC. Work invested in creating effective performance measures will provide significant benefit in efficiencies found and savings realized when the BSC enables the discovery of performance deficiencies within an organization.

CONCLUSION

The Comd RCAF has prepared a thorough strategic plan to be followed by all members of the RCAF in order to meet his end state. In response to the 2016 RCAF AIRPower Research List, the aim of this article is to recommend a performance-measurement framework to assess the RCAF's ability to meet Comd RCAF's strategic objectives. Currently, there are no clear measures in place to determine exactly how well the RCAF is performing with respect to the current strategic objectives. In order to properly measure performance, it is recommended that Kaplan's BSC is implemented and aligned with the RCAF's objectives, as this will indicate whether the Comd RCAF's intent is being met and where improvements are necessary. In discussing Kaplan's BSC theory; showing its successful implementation within industry and military environments; and, finally, proposing its application within the RCAF, it has been demonstrated how Kaplan's BSC can move the RCAF forward towards the Comd's objectives.

RECOMMENDATIONS

Based on the benefits discussed above and the relative simplicity of the BSC concept, it is recommend that the BSC be implemented in order to measure the ability to meet the Comd RCAF's objectives. The BSC is a method that aligns an entire organization to ensure that each member is working towards the organization's strategy in each task that is carried out. The BSC provides a detailed view of all of the factors which can impact an organization in order to prioritize resources to maximize efficiencies across all aspects of operations.²¹

There are several cases within industry and other air forces where large organizations were able to make substantial, long-term advances in the efficiency of their operations. With further study and coordination, the aspects that the organizations analysed to capitalize on can be shared and assessed by the RCAF in order to best initiate the BSC concept. The RAF proved that using a modified BSC to meet unique military needs provided the same benefit that Mobil exploited by applying the simple principles of strategic alignment and performance measure of key objectives. With help from military and industry partners to share lessons learned and display the benefits of the approach of total strategic alignment, buy-in can be obtained in order to maximize the potential of the BSC concept.

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ABBREVIATIONS

AIRPower	agile, integrated, reach and power
BSC	Balanced Scorecard
CAF	Canadian Armed Forces
CEO	chief executive officer
Comd	commander
NATO	North Atlantic Treaty Organization
RAF	Royal Air Force
RCAF	Royal Canadian Air Force
RNoAF	Royal Norwegian Air Force

NOTES

1. “Royal Canadian Air Force AIRPower Research List 2016,” (Ottawa: RCAF, 2016), 13, accessed March 20, 2017, <http://w08-ttn-vmweb01/cfawc/en/awe/rcaf-airpower-research-list.asp> (Defence Wide Area Network only).

2. “Comd RCAF’s Flight Plan” (Ottawa: RCAF, 2015), accessed March 20, 2017, http://rcaf.mil.ca/assets/RCAF_Intranet/docs/en/d-air-plans/comd_rcaf_s_flight_plan.pdf. Also appears on page 53 of this issue of the *Journal*.

3. Ibid.

4. Robert S. Kaplan, “Conceptual Foundations of the Balanced Scorecard” (working paper 10-074, Harvard Business School, Cambridge, MA, 2010), accessed March 20, 2017, <http://www.hbs.edu/faculty/Pages/item.aspx?num=37638>.

5. Ibid.

6. Ibid.

7. L. Lysard, “Learning for Organizational Performance” (MBA5270B Information and Knowledge Management, Telfer School of Management, Ottawa, 2016).

8. “Key Performance Indicators: Developing Meaningful KPIs” (Intrafocus, September 2014), accessed March 20, 2017, <https://www.intrafocus.com/wp-content/uploads/2014/09/Developing-Meaningful-Key-Performance-Indicators-V7.pdf>.

9. Ibid.

10. Ibid.

11. Lysard, “Learning for Organizational Performance.”

12. Kaplan, “Conceptual Foundations.”

13. “The Strategy-Focused Organization,” R. Kaplan, Harvard Business School (October 23, 2000), accessed July 14, 2017, <http://hbswk.hbs.edu/item/the-strategy-focused-organization>.

14. Ibid.

15. Ibid.

16. “Balanced Scorecard Collaborative Honours Kinnarps AB, Pliva D.D., and Royal Norwegian Air Force with Prestigious Hall of Fame Award,” Robert L. Howie, Jr., PR Newswire (June 11, 2003), accessed March 20, 2017, <http://www.prnewswire.co.uk/news-releases/balanced-scorecard-collaborative-honours-kinnarps-ab-pliva-dd-and-royal-norwegian-air-force-with-prestigious-hall-of-fame-award-154159275.html>.

17. Radoslav Ivancik and Pavel Necas, “System of Balanced Scorecard and Its Implementation in Management of Norwegian Air Force and other Military Organizations,” *INCAS Bulletin* 4, no. 4 (2012), 141–150.

18. Ibid.

19. “Measuring and Managing Performance in the Royal Air Force” (management case study, Advanced Performance Institute, Buckinghamshire, UK, 2007).

20. Ibid.

21. Kaplan, “Conceptual Foundations.”



AIRPOWER IN FORMATION

AGILE • INTEGRATED • REACH • POWER

COMD RCAF'S FLIGHT PLAN

RCAF VISION:

An [A]gile and [I]ntegrated air force with the [R]each and [P]ower [AIRPower] essential to CAF operations.

RCAF MISSION:

The RCAF will provide the CAF with relevant, responsive and effective air power to meet the defence challenges of today and into the future.

COMD RCAF GOALS / END STATE

In order to achieve our vision we must fly the correct **APPROACH**:

- ▶ **Airworthiness** and effective risk management the norm, based on a successful safety programme
- ▶ **Professional Airpower Mastery** and airpower mindedness enhanced
- ▶ **Persistent delivery** of high-calibre air power assured
- ▶ **Reputation and credibility** enhanced within the CAF, DND and across Government
- ▶ **Optimize Air Force strategic framework** institutionalized, resulting in improved RCAF institutional discipline and accountability
- ▶ **AIRPower** improved, by criteria, in a measurable way
- ▶ **Collaboration, coordination and integration** as a cultural mindset, leading to improved effectiveness and greater strategic and institutional influence
- ▶ **History and heritage** integrated as core business

AIRPower is derived fundamentally from the RCAF vision, which brings together the concepts and capabilities that position the RCAF as an [A]gile and [I]ntegrated air force with the [R]each and [Power] essential for CAF operations. It is both a practical (air power) and intellectual (airpower) element. Both elements need to be mastered.

To achieve airpower mastery in today's interconnected and interlinked world, all members of the RCAF must fly **In Formation** – working together as one – regardless of their job, their aircraft, or their mission. The RCAF must also fly **In Formation** with our coalition partners, sister services, DND colleagues and other government departments and organizations.

NAVAIDS:

- ▶ Sustain and build upon successful delivery of high-calibre air power
- ▶ Harness the intellectual capital of the RCAF
- ▶ Leverage RCAF history and heritage based on an overarching history and heritage plan
- ▶ Improve RCAF effectiveness through greater integration and coordination
- ▶ Institute the RCAF Optimized Air Force Strategic Framework to enhance institutional discipline and accountability
- ▶ Ensure commitment to the RCAF airworthiness and safety system
- ▶ Promote the RCAF ethos

TEAM
VALUES

WARFIGHTERS
PROFESSIONALISM

DEFENCE TEAM
EXCELLENCE

FAMILIES
TEAMWORK

POINT/COUNTERPOINT



POINT

CHERRY-
PICKING
BOYD

By Captain Alex Gignac

Editor's note: This paper was written by a candidate attending the Air Power Operations Course in fulfilment of one of the requirements of the course of studies.

Colonel John Boyd was a very imposing man. He communicated using harsh, succinct language and accomplished his aims through what some would qualify as finagling means. Within the context of the Canadian Armed Forces (CAF), could it be said that the leadership demonstrated by Colonel Boyd (as read in Robert Coram's book: *Boyd: The Fighter Pilot Who Changed the Art of War*) questions the veracity of CAF's conceptual foundations of leadership? It is the position of this article that despite Boyd's less desirable traits, he did in fact exhibit the many qualities of a leader as described in CAF leadership doctrine. This will be demonstrated by examining the fundamentals of toxic, charismatic and transformational leadership, while comparing these concepts to Boyd's life and his influence on his subordinates while he was at the Pentagon. Arguably, this was his most disagreeable phase, but then, agreeable people have rarely been known to shape the world.¹

Leadership, in its most basic definition, is the act of “directly or indirectly influencing others, by means of formal authority or personal attributes, to act in accordance with one’s intent or a shared purpose.”² By simple virtue of his rank, Boyd, throughout all his appointments and promotions, *must* have been a leader. It is the most basic duty of every officer to lead troops and subordinates. The question to pose then becomes: what kind of leader does an officer choose to become? Choices in actions, attitudes and command relationships are important in defining one’s leadership style. Three styles of leadership can be used to frame the Boyd question: toxic leadership, charismatic leadership and transformational leadership.

The argument can be made that Boyd was, in fact, a toxic leader. These leaders tend to be viewed as “insensitive or indifferent to human relationships, psychologically insecure, or just hostile; they tend to be viewed by subordinates as arrogant, self-serving, inflexible, petty, and unconcerned about subordinate well-being.”³ There is no way Boyd could be accused of having been humble. Boyd displayed many characteristics which fall into this toxic category. Hostile to dissent within his ranks and extremely insensitive to those who stood in his way, it can be easy to lump Boyd’s actions with that of a toxic tyrant. This, though, is not an accurate representation of Boyd. Those who perceived him as toxic were typically antagonists to his cause and outside of his command. A quick examination of charismatic and transformational leadership will show that Boyd did, in fact, possess the qualities of a leader as per CAF leadership doctrine.

Seldom do *acolytes*⁴ follow weak, untalented leaders. This term is used incessantly when referring to Boyd’s entourage of faithful henchmen in Coram’s book. “[F]ollowers of charismatic leaders tend to identify strongly with, to be emotionally attached to, and to be deeply committed to the persona of the charismatic leader.”⁵ Men like “Chuck” Spinney and James Burton were ready to lay their careers on the line to achieve the goals set before them by Boyd. The constant mantra of “do[ing] something ... rather than be[ing] somebody”⁶ was repeated often by Boyd and his followers when preparing themselves for battle against their bureaucratic foes.

CAF leadership doctrine defines a charismatic leader as having “the ability to project self-confidence and dominance, strong convictions which supposedly tap into the latent hopes and desires of their followers, the ability to express their beliefs convincingly and powerfully, and the willingness to take risks or act on their beliefs in unconventional but symbolic ways.”⁷ The definition, itself, of a charismatic leader borders on the messianic. This may well seem to be the case when reading the life story of Boyd. Therefore, one can say that what is toxic to some is gospel to others. The ability to tap into the subordinates’ faith in the leader may be the realm of the charismatic leader, but being able to get subordinates to think critically, and creatively, about the mission requires a transformational style of leadership.

Boyd appears to have been a leader in every sense explored so far. He was a toxic antagonist to opponents; a savior to his followers; and, as will be shown here, a transformational leader. CAF leadership doctrine describes the transformational leaders as “moral agents, whose efforts are directed toward the realization of important social values and principles.”⁸ But what differentiates these leaders from their charismatic counterparts? By this simple definition, Boyd was simply a moral compass to his acolytes. “What sets them apart as leaders is their ability to alter the moral awareness of others, to sharpen their sense of discrepancy between what is and what could be, to provide a path for social change, and thereby to rouse followers to collective, sometimes revolutionary, action.”⁹

This facet of Boyd’s leadership is best demonstrated through his lasting effects on the United States Marine Corps (USMC). By inspiring Lieutenant Colonel Wyly to “fight the enemy, not the

terrain,”¹⁰ Boyd set the stage to revolutionize the way the USMC goes to war. Through his many discussions with Wyly, Boyd was able to indirectly shape the thinking of young officers, thereby altering the USMC’s organizational culture. He was able to communicate the meaning and importance of the work being done in the USMC’s manoeuvre warfare revolution, which in turn “stimulate[d] the thinking of ... [his] subordinates and encourage[d] innovation and creativity ... ”¹¹ This marks Boyd as an influential transformational leader, instead of a toxic and simply messianic entity.

Finally, it can truly be said that the leadership displayed by Boyd *does not* question the veracity of CAF’s conceptual foundations of leadership. Boyd was not some strange anomaly in leadership. Those who thought he was toxic were typically his opponents and were not under his command. His charisma generated a group of acolytes who were emotionally attached to his worthy cause. He used transformational leadership to inform his subordinates and granted them the freedom of action and thought required to accomplish their goals. The Royal Canadian Air Force (RCAF) can’t cherry-pick who fits, or not, within the boundaries of CAF’s leadership doctrinal definitions. Would selectively applying the standard of leadership generate the leaders the RCAF truly needs?

Upon receipt of his wings, Captain Gignac was posted to 407 Long Range Patrol Squadron, where he completed his upgrade to crew commander and deployed to Operation IMPACT ROTO 0 in October 2014. On his return from the Middle East, Captain Gignac was posted to 404 Long Range Patrol and Training Squadron, where he teaches the Maritime Operational Aircrew Training (MOAT) as an instructor pilot. Since then he has deployed to Iceland, to chase submarines, and Japan as Air Task Force Commander for Operation HIGH SEAS DRIFTNET 2016. He holds a Bachelor of Engineering from the Royal Military College of Canada in Kingston.

ABBREVIATIONS

CAF	Canadian Armed Forces
DND	Department of National Defence
RCAF	Royal Canadian Air Force
USMC	United States Marine Corps

NOTES

1. Malcom Gladwell, *David and Goliath: Underdogs, Misfits, and the Art of Battling Giants* (New York: Little, Brown and Company, 2013).

2. Canada, Department of National Defence (DND), A-PA-005-000/AP-004, *Leadership in the Canadian Forces: Conceptual Foundations* (Ottawa: Canadian Defence Academy, 2005), 7, accessed March 1, 2017, <http://www.publications.gc.ca/pub?id=9.697209&sl=0>.

3. Ibid., 68.

4. Robert Coram, *Boyd: The Fighter Pilot Who Changed the Art of War* (New York: Little, Brown and Company, 2002.), 201.

5. Canada, DND, A-PA-005-000/AP-004, *Leadership in the Canadian Forces*, 67.

6. Coram, *Boyd*, 310.

7. Canada, DND, A-PA-005-000/AP-004, *Leadership in the Canadian Forces*, 67.

8. Ibid., 68.

9. Ibid.

10. Coram, *Boyd*, 381.

11. Canada, DND, A-PA-005-000/AP-004, *Leadership in the Canadian Forces*, 68.

COUNTER POINT

FLAWED HEROES: COLONEL JOHN BOYD'S FAILED LEADERSHIP

By Captain Rebecca L. Wynn, USAF

Editor's notes:

1. This paper was written by a candidate attending the Air Power Operations Course in fulfilment of one of the requirements of the course of studies.
2. The author's American spelling conventions have been maintained.

Colonel John Boyd was an incredible fighter pilot. In his biography, Robert Coram paints Boyd's accomplishments as United States Air Force (USAF) legends, which are still revered among those who fly. Coram describes Boyd's flaws and misgivings as small nuances that are overshadowed by his fanatical determination to shake up the old guard and by his dogged pursuit of academic truth and fighter tactics. Boyd inspired a level of hero worship that persists in USAF to this day, yet despite those who followed Boyd almost religiously—his acolytes—he was never a leader by the standards of the Canadian Armed Forces (CAF).

Boyd had many talents, but social skills were not in his repertoire. While building teamwork is a functional responsibility of CAF leaders,¹ Coram noted that Boyd's "primary form of social intercourse was confrontation."² During his stint at Eglin, he became "widely known in the Air Force as a man who could be difficult to get along with. Sometimes it seemed he went out of his way to be obstreperous."³ Boyd was a fighter and "just would not bend, even on things that did not matter to most people."⁴ Boyd's need to fight,

his driving desire to prove himself better than everyone alienated and, at one point, terrified those who dared go against him. A civilian who had the audacity to try and block Boyd's progress was humiliated in public, as Boyd physically and verbally confronted him while in uniform, burned a hole in his tie with a cigar and chased him out of the building, all while bellowing "You're a fucking loser!"⁵

These few examples of Boyd's pervasive mistreatment of people who didn't follow his dogma go against so many of the tenets of CAF leadership. Most tellingly, they show complete disregard of the military professionalism inherent in CAF's conduct values.⁶ These core values, embodied in the military ethics and ethos, are central to effective leadership because they "pervade all activities, simultaneously guiding, and setting limits on, behaviour."⁷ In the "Department of National Defence and Canadian Forces Code of Values and Ethics," Ethical Principle 1 states, "Respect the dignity of all persons, at all times and in all places, ... by treating every person with respect and fairness ... helping to create and maintain safe and healthy workplaces that are free from harassment and discrimination ...".⁸ Boyd's fighting spirit and undeniable drive for validation make him an excellent fighter pilot; however, they are not skills that translate well to leadership unless harnessed by a strong sense of ethics.

In true fighter-pilot fashion, if it wasn't a fighter, it didn't matter. Boyd did not foster professionalism and cohesion at any level, calling bomber pilots "a bunch of truck drivers."⁹ When he was assigned bombers out of initial flight training, Boyd allegedly threatened to resign his commission.¹⁰ It was fighters or nothing at all. Test pilots or "Edwards pukes" were also detestable to Boyd: "bomber pukes and Edwards pukes ranked only slightly above people who did not fly, the nonrated bureaucrats known as 'staff pukes.'"¹¹ Even the USAF demonstration team was not good enough for Boyd, who called them "fucking circus performers" and said that "a goddamned bunch of old ladies," could be "trained to do the same thing."¹² He would continue to repeat these types of comments over the years. This flew in the face of professional cohesion, as Boyd thought less and less of anyone who wasn't of his ilk. In CAF culture, "each member of the profession of arms in Canada is considered on some level as an equal member of a distinctive community. Consequently, all have a shared responsibility and right to contribute to the health and functioning of the profession, principally through the process of mutual influence."¹³

Despite a few exceptions, Coram describes Boyd as a terrible leader of people. The only time Boyd cared about anyone else was when that person agreed with him. Boyd demanded unwavering acceptance of his ideas; those who didn't faced exile.¹⁴ Coram best described this paradoxical attitude when Boyd "often-times chewed out enlisted personnel for looking sloppy [while] he stood there, his own shirttail hanging over his belt and trousers wrinkled."¹⁵ When working in Development Plans, Boyd took aside an officer "he judged [was] particularly ineffective" and told him in no uncertain terms that he never wanted to see or hear from him again, for which the officer would be rewarded with outstanding evaluations.¹⁶ A few major leadership functions are to "mentor, educate, & develop subordinates" as well as to "exemplify and reinforce the military ethos ... [and] uphold professional norms."¹⁷ Boyd only did so when it suited him.

Some would argue that Boyd's time in Southeast Asia and his stint at Fighter Weapons School (FWS) made him a great leader and that his personal faults are to be forgiven for his accomplishments. During his stint as commander of the 56th Combat Support Group, Boyd made great headway in a wartime environment where he was actively fighting and interested in his job; however, he gave an unlawful order for a man to continue an extramarital affair with a Thai woman.¹⁸ As an FWS instructor, he showed great personal mentorship of Ronald Catton, but it was only because Catton came to him as a supplicant, a willing follower eager to recover his reputation.¹⁹ These glimmers of leadership, misguided at times, do not give Boyd a pass on his terrible behaviors. Leadership aside, CAF leadership doctrine states "all members of the profession of arms in Canada share in the responsibility for safeguarding the integrity, reputation, and image of the CF [Canadian Forces]—at a minimum, by regulating their personal conduct and by influencing others to comply with professional norms."²⁰ Professionalism is not something you can only do sporadically as a leader—it must be pervasive.

Leadership is more than legendary skill, mission results and wartime bravery. It is a balance of personal traits and an adherence to military ethos that allows a person to become a true leader. While technical expertise, motivation and determination are all traits of a good leader, all of those cannot be truly exercised without interpersonal skills and professionalism. Coram's biography describes Boyd's lack of professionalism and

teamwork for a member of the military, not to mention what is expected of an officer. For Boyd, “to be right was not enough. He had to have a redress of grievances and he had to publicly embarrass the person who wronged him. He had to be the last man standing.”²¹ To be so unyieldingly, so stubbornly tied to aggressive, at-all-costs self-advancement makes Boyd a poor leader, incapable of compromise and personnel development.

Captain Rebecca Wynn, USAF, is an air battle manager with experience on E-3B/C/G airborne early warning and control (AWACS) aircraft. She has deployed multiple times in support of Operation ENDURING FREEDOM and Operation INHERENT RESOLVE. Currently, Captain Wynn is the Flight Commander, Tactical Command and Control Division, 561st Joint Tactics Squadron, Nellis Air Force Base, Las Vegas, Nevada.

ABBREVIATIONS

CAF	Canadian Armed Forces
DND	Department of National Defence
FWS	Fighter Weapons School
USAF	United States Air Force

NOTES

1. Canada, Department of National Defence (DND), A-PA-005-000/AP-004, *Leadership in the Canadian Forces: Conceptual Foundations* (Ottawa: Canadian Defence Academy, 2005), 48, accessed March 1, 2017, <http://www.publications.gc.ca/pub?id=9.697209&sl=0>.

2. Robert Coram, *Boyd: The Fighter Pilot Who Changed the Art of War* (New York: Back Bay Books, 2004), 143–44.

3. *Ibid.*, 179.

4. *Ibid.*

5. *Ibid.*, 179–80.

6. Canada, DND, A-PA-005-000/AP-004, *Leadership in the Canadian Forces*, 18–23.

7. *Ibid.*, 21.

8. Canada, DND, A-JS-005-DEP/FP-001, “Department of National Defence and Canadian Forces Code of Values and Ethics” (Ottawa: DND, 2013), 9, accessed March 1, 2017, http://www.forces.gc.ca/assets/FORCES_Internet/docs/en/about/code-eng.pdf.

9. Coram, *Boyd*, 36.

10. *Ibid.*, 44.

11. *Ibid.*, 62.

12. *Ibid.*, 77.

13. Canada, DND, A-PA-005-000/AP-004, *Leadership in the Canadian Forces*, 125.

14. Coram, *Boyd*, 55.

15. *Ibid.*, 149.

16. *Ibid.*, 281.

17. Canada, DND, A-PA-005-000/AP-004, *Leadership in the Canadian Forces*, 49.

18. Coram, *Boyd*, 273–74.

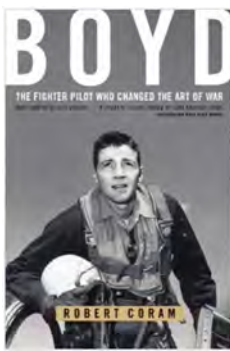
19. *Ibid.*, 108.

20. Canada, DND, A-PA-005-000/AP-004, *Leadership in the Canadian Forces*, 115.

21. Coram, *Boyd*, 180.



BOOK REVIEWS



BOYD: THE FIGHTER PILOT WHO CHANGED THE ART OF WAR

By Robert Coram

New York: Back Bay Books / Little, Brown and Company, Time Warner Book Group, 2004

449 pages

ISBN 0-316-79688-3



Review by **Lieutenant-Colonel Doug Moulton, CD, MBA**

As Royal Canadian Air Force officers, it is incumbent upon us to maintain an ongoing professional-reading programme. Interestingly enough, it was my father who introduced me to this book on Colonel John Richard Boyd, saying something about him being an interesting character. My father somewhat understated the truth in this instance. Robert Coram—an author, freelance writer and journalist—has written an insightful book, detailing the exploits of this maverick fighter pilot. His book, *Boyd: The Fighter Pilot Who Changed the Art of War*, is outstanding, and I recommend it to anyone with an interest in air power and its evolution.

The book, written chronologically, follows Boyd's life from its humble beginnings in Erie, Pennsylvania, until his death. The book is divided into three main sections, which cover his time as a fighter pilot, followed by his transformation into an engineer and, finally, to that of a scholar. Although his family life is interspersed throughout the book, it sits in contrast to his military life. A fighter pilot consumed by his passion for the application of air power, this book shows the development of Boyd's unique insights into air power theory.

Coram does an incredible job of describing Boyd's career, which spanned World War II, Korea and Vietnam. This context allows the reader to understand that it was these combat experiences that drove Boyd to invest so much of himself into his craft. Beyond the mere telling of Boyd's life story, Coram delves deeply into his relationship with his acolytes. As Coram transitions from Boyd's days as a fighter pilot to those as an engineer and scholar, it is Coram's exploration of these relationships that allows us to understand how Boyd flourished. These acolytes would prove essential to Boyd's success, as he pushed the envelope of American aircraft acquisition, which Coram exposes for the political war that it is. These relationships also serve to highlight the importance of the individuals that we gather around us as we proceed through our careers.

This introspective provides a backdrop to Boyd's understanding of the art of war. Throughout the book, we are aware that a Rembrandt is at work, as Coram shows Boyd painting his masterpieces such as "Destruction and Creation," which is included as an appendix to the book. It is through Coram's investigative efforts that we really appreciate what Boyd accomplished throughout his life and the debt all aviators owe him.

Boyd: The Fighter Pilot Who Changed the Art of War is a well-researched and well-written book that will prove an enjoyable and easy read for air power enthusiasts.

Lieutenant-Colonel Doug Moulton, a Sea King pilot, is currently the Air Warfare Education, Information Section Head at the Canadian Forces Aerospace Warfare Centre, Trenton.