



NATO FLYING TRAINING IN CANADA: AN OPERATIONAL LESSONS-LEARNED PERSPECTIVE

Major Michele Pistilli

JCSP 49

Exercise Solo Flight

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Major Michele Pistilli

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INTRODUCTION

The Royal Canadian Airforce (RCAF), since its establishment in 1924, has always had a vital and influential role in developing, contributing, and conducting military flying training. Canada has been blessed with the most essential and rarest commodity for military flying training, sizeable open-air space.¹ This, including the distinct four seasons experienced and distance from the front lines, made Canada the ideal location to conduct flying training during the second world war. The British Commonwealth Air Training Program (BCTAP) was announced near the Second World War's start in 1939.² The BCTAP required many satellite airfields to be established across Canada, many located in the prairie regions. These regions were selected due to their flat terrain and long summer daylight hours, which are ideal for teaching new pilot recruits. The BCTAP program was enormously successful and was crucial in the Allies' defeat of Nazi Germany in the war.³ This success in training pilots was carried on through the Canadian Pilot training system for the remainder of the 20th century. Unfortunately, only three of those approximately one hundred original training locations⁴ remain, 402 Squadron in Winnipeg, Manitoba, 3 Canadian Forces Flying Training School (CFFTS) in Portage la Prairie, Manitoba, and 2 CFFTS Moose Jaw, Saskatchewan. The three remaining flying schools train RCAF officers in everything from Air Combat Systems Officer (ACSO) Training, formerly Navigators, to primary, basic, advanced single-seat high-performance aircraft, multi-engine transport, and helicopter pilot training.⁵

This essay will focus on 15 Wing, 2 CFFTS in Moose Jaw, Saskatchewan, particularly its current basic flying and high-performance flying training iteration, the NATO Flying Training Program in Canada (NFTC). NATO flying training was not new when the NFTC contract was signed in 1998 and established in 2000.⁶ Coalition flying training began with the BCTAP and continued post-World War II in the 1950s, with numerous participating NATO nations flying aircraft from the propeller age into the jet age across the numerous remaining flying stations. These flying training partnerships varied throughout the years and were met with primarily successful results for the

¹ "NAV CANADA About Us," accessed April 24, 2023, <https://www.navcanada.ca/en/corporate/about-us.aspx>.

² Veterans Affairs Canada, "The British Commonwealth Air Training Plan - Historical Sheet - Second World War - History - Veterans Affairs Canada," June 7, 2021, <https://www.veterans.gc.ca/eng/remembrance/classroom/fact-sheets/britcom>.

³ Canada.

⁴ "List of British Commonwealth Air Training Plan Facilities in Canada," in *Wikipedia*, April 14, 2023, https://en.wikipedia.org/w/index.php?title=List_of_British_Commonwealth_Air_Training_Plan_facilities_in_Canada&oldid=1149726393.

⁵ Royal Canadian Air Force National Defence, "Training and Education - Royal Canadian Air Force," not available, April 10, 2013, <https://www.canada.ca/en/air-force/services/training-education.html>.

⁶ Public Works Government Services Canada, "Canada Services Agreement in Support of the Training of Canadian Military Pilots between Her Majesty the Queen in Right of Canada and Bombardier Inc." (Government of Canada, May 12, 1998).

participants.⁷ During the Canadian military decline in the latter 1980s and especially in the mid-1990s, the RCAF sought to offload some of the burdens of flight training due to budgetary restraints due to the Force reduction plan.⁸ As a result, Bombardier Aerospace put forth a sole-source proposal to be the prime contractor for the RCAF and establish a NATO flying training school to attract NATO participants to conduct their flying training in Moose Jaw, SK and Cold Lake, AB. This was to establish a military aviation business practice while releasing some of the burdens from the RCAF⁹, which was in the middle of a Canadian Armed Forces (CAF) comprehensive force reduction plan.¹⁰ This, in theory, was to be a symbiotic relationship where both organizations could profit from a rapidly changing political and military landscape. Unfortunately, after nearly 23 years after the program's debut, the results did not produce the desired outcomes for either organization. All the original partnering nations have withdrawn from the NFTC program except the host Canada. Bombardier sold the NFTC program to Canadian Aviation Electronics (CAE) in 2015. The RCAF is amid a pilot retention and training problem, which it has been unable to improve since the mid-2010s.¹¹¹²

A new Canadian military flying training contract award is currently ongoing bid evaluation as of the writing of this essay. The new program, named the Future Aircrew Training Program (FAcT), is expected to be in place by the end of the decade, 2028/2029.¹³ NFTC has been extended a third time to meet this gap in contract establishment, ten years beyond its original expected lifetime and contract end date of 2020.¹⁴ This essay will analyze the NFTC program up to this point from an operational effectiveness perspective and try to identify the successes and shortcomings of the program to produce lessons learned and how to improve for the future. The author will use their over 12 years of experience working at the NFTC program at all levels, from an instructor's perspective, the chief of standards, a flight commander, and a Standards and Evaluation Team (SET) auditor to identify and analyze these observations. The goal is to avoid repeating costly errors, and if should the FAcT program one day decides to incorporate NATO coalition partners into its model, will it be to its advantage as it was in the past?

⁷ R.F. Holman, *Best in the West* (Moose Jaw: Big 2 Fund, 15 Wing Moose Jaw, 1995).

⁸ Public Works Government Services Canada, "Canada Services Agreement in Support of the Training of Canadian Military Pilots between Her Majesty the Queen in Right of Canada and Bombardier Inc."

⁹ "Committee Report No. 18 - PACC (37-2) - House of Commons of Canada," accessed April 24, 2023, <https://www.ourcommons.ca/DocumentViewer/en/37-2/PACC/report-18/>.

¹⁰ "Committee Report No. 18 - PACC (37-2) - House of Commons of Canada."

¹¹ Royal Canadian Air Force National Defence, "The Race to Retain and Increase Experience Levels in the RCAF - News Article - Royal Canadian Air Force," not available, July 30, 2019, <https://www.canada.ca/en/departement-national-defence/maple-leaf/rcaf/2019/07/the-race-to-retain-and-increase-experience-levels-in-the-rcaf.html>.

¹² RUSI(NS) Staff, "Why Pilot Training Production for the RCAF Is Failing and Why Are Pilot Losses Mounting," *RUSI(NS)* (blog), March 31, 2021, <https://rusi-ns.ca/pilottraining/>.

¹³ Public Services and Procurement Canada Government of Canada, "Future Aircrew Training Program - Air - Defence and Marine Procurement - Buying and Selling - PSPC Services - PSPC," March 12, 2018, <https://www.tpsgc-pwgsc.gc.ca/app-acq/amd-dp/air/snac-nfps/ffpn-fact-eng.html>.

¹⁴ "Canada Extends CAE's NFTC Contract Through 2027 Valued at More than \$550M CAD | Canadian Defence Review," accessed April 24, 2023, <https://www.canadiandefencereview.com/news/3351>.

PART ONE- NFTC AIRCRAFT OPERATIONAL HISTORY

The NFTC contract was signed in 1998 and began operation in 2000, but it only started to produce pilot graduates late that year.¹⁵ The program was initially met with numerous setbacks resulting in a slow start. The original CT156 Harvard IIs and CT155 Hawk aircraft purchases experienced delays and small initial student course loads due to the reduced number of aircraft and trained instructors available.¹⁶ The ramp-down of the existing flying training on the CT-114 tutor also added complications. The wing was under transition, and the older aircraft could no longer aid the shortfall in the early part of the NFTC. NFTC's original purchase was for 24 CT156 aircraft, with an additional two placed in 2002 for a total of 26. As of writing this essay, only 22 flyable aircraft remain, with two lost to crashes¹⁷ and two permanently grounded for the use of spare parts. The CT155 aircraft's original purchase of 22 aircraft has also dwindled to 16, with two spare parts aircraft, one sold to a foreign country, and three lost to crashes.¹⁸ This left 38 jets in total available to conduct flying training. When considering the split of the CT155 aircraft in 4 Wing Cold Lake for Fighter Lead-in Training (FLIT), there is only a maximum of 30 possible aircraft to fly at 15 Wing, compared to the original 190 CT114 aircraft ordered in 1961¹⁹ for the RCAF flying training—an 80% reduction of aircraft available to fly for basic and advanced fast jet training.

Aircraft Ownership and Control

The NFTC aircraft were not initially owned by the RCAF and were leased from a consortium through Bombardier, now CAE.²⁰ The rushed nature of the NFTC contract implementation timeline required an immediate purchase of aircraft, bypassing the lengthy bureaucratic procurement process the government in Canada has in place.²¹ This resulted in the aircraft, although under military registration, being owned by a civilian entity and under civilian regulations requiring the purchase of civilian insurance to be airworthy. This would result in conflicts of interest when the RCAF would be willing to accept operational risks but would still require the contractor and insurance agency to accept that risk to be civilian insurance compliant. This was costly to the program in lost

¹⁵ Public Works Government Services Canada, "Canada Services Agreement in Support of the Training of Canadian Military Pilots between Her Majesty the Queen in Right of Canada and Bombardier Inc."

¹⁶ Auditor General of Canada, "Report from the Auditor General of Canada - NATO Flying Training in Canada" (Government of Canada, May 2006).

¹⁷ Royal Canadian AirForce, "Flight Safety Information Management System (FSIMS)," FSIMS (Government of Canada, n.d.).

¹⁸ Royal Canadian AirForce.

¹⁹ "Canadair CT-114 Tutor," in *Wikipedia*, April 4, 2023,

https://en.wikipedia.org/w/index.php?title=Canadair_CT-114_Tutor&oldid=1148205130.

²⁰ T.F.J Leversedge, "RAYTHEON CT-156 HAVARD II ROYAL CANADIAN AIR FORCE SERIAL NUMBERS & INDIVIDUAL HISTORIES," *RAYTHEON CT-156 HAVARD II ROYAL CANADIAN AIR FORCE SERIAL NUMBERS & INDIVIDUAL HISTORIES*, no. 2 (2019).

²¹ Public Works and Government Services Canada, 99-641 Final Report Audit of Major Contracts, Feb 1, 2000, pg A12

sorties and aircraft availability.^{22,23} The most common operational issue experienced throughout the program was operations under icing conditions. A Record of Airworthiness Risk Management (RARM) was created for CT155 to enable operation in minor icing conditions²⁴. The RARM permitted aircrews to investigate certain icing conditions; For the CT156 flight in icing conditions was not permitted. Once the icing was confirmed, even at the very light rime level, operations through the cloud ceased until it was proven ice no longer existed. More flexibility was granted to the CT155 due to its operating speed and the possibility of friction to remove ice build-up.²⁵ The unwillingness of the civilian agency to accept this elevated risk resulted in the majority of the lost flying sorties for the NFTC program since almost half the year operations are conducted below zero degrees Celsius.²⁶ The CT114 had similar issues and was not equipped with anti-icing equipment, just like the CT156 and CT155, but being owned by the state; they were not obliged to purchase insurance for the aircraft, and risk acceptance fell under the total jurisdiction of the RCAF airworthiness program. The RCAF conducted its airworthiness program and accepted the risk in certain icing conditions for the CT114. However, it could not exercise the same oversight on the NFTC aircraft without contractor compliance as a main stakeholder.

Program Design – zero tolerance for error

The reduced number of aircraft compared to the earlier years of CT114 increased maintenance cancelled sorties for NFTC. The CT156 and CT155 aircraft have undergone different upgrades and maintenance periods. These upgrades reduced the number of aircraft available for sorties. For example, during the Traffic Awareness System upgrade of the CT156 beginning in the late 2010s, the contractor could not produce the required aircraft per day to keep the program on time due to the limited number of aircraft available.^{27,28} When under conception and pitched to the government, the NFTC program was pitched in an almost constant perfect scenario where no major maintenance issues were foreseen, and all timings were given with minimal leeway for error. The high daily turnaround of aircraft with the almost non-existence of spare aircraft resulted in an operation with little to zero room for error or the possibility to accommodate unforeseen circumstances.

Operational taskings outside the primary mission of student production also caused contention between the contractor and the RCAF. For example, 15 Wing was often tasked by 1 Canadian Air Division Headquarters (1 CAD) to conduct flybys for

²² M. Pistilli, “2 CFFTS Flying Training Evaluation Report,” Flying Training Evaluation (2 Canadian Air Division, October 2021).

²³ M. Pistilli, “2 CFFTS Flying Training Evaluation Report,” Flying Training Evaluation (2 Canadian Air Division, December 2018).

²⁴ Darlene Callaghan, “Record of Airworthiness Risk Management CT155 - Operation in Icing Conditions” (1 Canadian Air Division Operational Airworthiness/CAE, 2013).

²⁵ Callaghan.

²⁶ “Moose Jaw Climate, Weather By Month, Average Temperature (Canada) - Weather Spark,” accessed April 30, 2023, <https://weatherspark.com/y/3588/Average-Weather-in-Moose-Jaw-Canada-Year-Round>.

²⁷ Pistilli, “2 CFFTS Flying Training Evaluation Report,” October 2021.

²⁸ K Wilton, “Record of Decisions of the NFTC Steering Committee Meeting October 2020” (2 Canadian Air Division, October 2020).

special events and airshow demonstrations. These tasks were outside the program's scope but essential for RCAF operations, recruiting, and public relations. These taskings were not considered initially during program development and often caused friction with the contractor and headquarters since they increased delays in student pilot production. In addition, the aircraft being under civilian ownership and control required the contractor to agree to all taskings before the aircraft was tasked, especially when the taskings were outside the aircraft's contracted normal operating range.

The original pitched program had entirely focused on student pilot production. Another component that should have been addressed and grossly underestimated was the need for instructor pilot qualification flights and hours. With approximately 80 instructors and a *minimum* hourly requirement of 50 hours each to maintain instructor qualifications²⁹, it adds roughly an equivalent of 40 student pilots per year in aircraft hours required. These issues contributed to most of the program's flying operational delays, which caused most of the courses to fall behind.³⁰³¹³²

Wargaming to anticipate problems

The first solution to the root cause of the many aircraft training delays experienced during NFTC would be for the RCAF to ensure full aircraft fleet ownership. Ensure sufficient numbers are acquired to enable primary and secondary tasks to be completed, minimally affecting pilot production considering 1 CAD taskings, maintenance issues, and instructor qualification training. It is not possible to foresee all future challenges when acquiring an aircraft. However, programming a solution with no flexibility or possible contingencies was the most significant failure of the NFTC program. Taking an example from the Euro-NATO Joint Jet Pilot Training Program (ENJJPT), a similar concept to that of NFTC, where a coalition of nations join together to form a military pilot training school,³³ the stark contrast in numbers reveals how under-resourced NFTC was procured. ENJJPT currently has 47 T6 (CT156) aircraft and 63 T38 (CT155 equivalent). The Ratio of Students to aircraft, although similar between the T38 and CT155, is significantly different on the T6/CT156. NFTC has a ratio of 8.2 students per aircraft for Phase II, Phase III, and flight instructor school training, while ENJJPT has a ratio of 4.25 students per aircraft. ENJJPT starts 200 students yearly on the T6, and those 200 proceed onto the T38.³⁴ NFTC contracted (not actual) starts is 128 on phase two, 30 on phase three, and roughly 22 on the flight instructor school on the CT156 (Table 1).³⁵ NFTC has double the student requirements per aircraft vs ENJJPT.

²⁹ RCAF, "Flight Operations Manual" (1 Canadian Air Division, March 2023).

³⁰ K Wlton, "NFTC Steering Committee Meeting Power Point Presentation."

³¹ Pistilli, "2 CFFTS Flying Training Evaluation Report," October 2021.

³² Pistilli, "2 CFFTS Flying Training Evaluation Report," December 2018.

³³ "Euro-NATO Joint Jet Pilot Training Program (ENJJPT)," Sheppard Air Force Base, accessed April 30, 2023, <https://www.sheppard.af.mil/Library/Fact-Sheets/Display/Article/367537/euro-nato-joint-jet-pilot-training-program-enjjpt/https%3A%2F%2Fwww.sheppard.af.mil%2FLibrary%2FFact-Sheets%2FDisplay%2FArticle%2F367537%2Feuro-nato-joint-jet-pilot-training-program-enjjpt%2F>.

³⁴ Andrew LCol Faith, ENJJPT Aircraft Numbers, April 2023.

³⁵ Wlton, "NFTC Steering Committee Meeting Power Point Presentation."

Table 1 – NFTC vs ENJJPT

		CT156	CT155
NFTC	Aircraft	22	16
	Students	180	35
	Ratio	8.18	2.19
ENJJPT		T6	T38
	Aircraft	47	63
	Students	200	200
	Ratio	4.26	3.17

The contractor pushed a sole source solution to extract as much profit from a limited resource input. “The proposal was almost too good to be true. In fact, in retrospect, it probably was.”³⁶ This operating method is not practical or feasible in a military context, where constant evolutions and adaptations exist in a changing security, human resources, and priority environment. The future solution must include extensive wargaming of the system and ensure some overflow capacity to deal with required surges and unforeseen problems. Increasing the number of aircraft to a student-to-aircraft ratio closer to that of the ENJJPT model of 4 students per aircraft will be required.

PART TWO - NFTC INFRASTRUCTURE

The initial infrastructure at 15 Wing Moose Jaw was established in the early days of the BCTAP program. To this day, three hangars are still in use from their original construction nearly 80 years ago. Over the years of 15Wing and 2 CFFTS, infrastructure grew until the mid-1990s, when the CAF force reduction plan caused the drawdown of the air station. Many buildings were demolished as the base reduced military personnel, and the NFTC contractor began to take over. The NFTC contract stipulated that the base infrastructure related to the NFTC program would be under maintenance by the general contractor for the contract’s 20-year lifespan.³⁷ This liberated an already strained infrastructure upgrade budget on the CAF, as they were no longer required to add, increase, or budget maintenance on the base infrastructure related to NFTC. This now fell onto the management, control and priorities of the contractor.

³⁶ I.P. DeCarlo, “CONTRACTED PILOT TRAINING FOR THE RCAF: GETTING IT RIGHT THE SECOND TIME” (Canadian Forces College, 2016).

³⁷ Public Works Government Services Canada, “Canada Services Agreement in Support of the Training of Canadian Military Pilots between Her Majesty the Queen in Right of Canada and Bombardier Inc.”

Over the years, the older infrastructure at 15 Wing has fallen into an almost dilapidated state. The contractor held a position of fixing issues as they arose vice applying a preventative maintenance posture. This lack of preventive maintenance led to cases being seen or repaired only after discovering a problem. Some of the significant issues during the program have been constant hangar roof leaks and repairs, leading to water damage to the building, airfield drainage issues leading to water damage to nearby buildings and airfield lighting, and aircraft instrument approach systems.³⁸

NFTC Ramp Degradation

One of the most critical and expensive parts of an airfield is the prepared surfaces on which aircraft operate. When dealing with high-performance aircraft and the fragile and costly engines that are required to use them, the prepared surfaces must be in a state in which any external damage to these parts must be minimized not only for the cost of the aircraft repairs but more importantly to safeguard the crews that will fly this aircraft and ground personnel working around them.³⁹ The concrete surface covering the ramp at 15 Wing has been in need of replacement for over two decades. The freeze/thaw cycle of Canadian winters is difficult on concrete surfaces. Add in the consistent application of chemical anti-icing solutions several times a year; it causes increased wear and tear, similar to that experienced on ordinary roadways. This degradation has caused large cracks and pieces of broken concrete to become loose and detached, causing some Foreign Object Damage (FOD) on some aircraft. A 431 Squadron Snowbird Jet received significant engine damage from one of these pieces of concrete taxiing back from a sortie.⁴⁰ This caused significant delays in their training, as the engines for the CT114 are now small in number and require specialized maintenance and part fabrication since they are no longer produced.

The estimated cost of ramp replacement is in the hundreds of millions of dollars and is a lengthy endeavour. Unfortunately, the CAF's disregard for that responsibility and contractors' unwillingness to pay such a large sum amounted to minimal yearly repairs to the concrete seams. As a result, FOD incidents continue, delays to pilot production and ramp portions quarantined off are declared unsuitable for aircraft.⁴¹

Snow and Ice Control (SNIC)

Another responsibility divested to the contractor during the NFTC program was the SNIC operation on the airfield surfaces. On most operational aerodromes, SNIC is a 24-hour operation. Therefore, preventative and early action are essential to avoid more considerable operational delays that require significant time to clear snow and remove

³⁸ Julian Daintree Major, Interview with 15 Wing Current Operations Officer Maj J. Daintree 2018-2022 OPS O, 2014-2017 Wing Stds O, 2010-2014 CFS Det Comd, March 2023.

³⁹ "The Essential Guide To Military FOD Prevention," The FOD Control Corporation, accessed April 30, 2023, <https://www.fodcontrol.com/the-essential-guide-to-military-fod-prevention/>.

⁴⁰ 15 Wing Flight Safety, "FSIMS 176948 - CT114 FOD Damage," Flight Safety Report (Moose Jaw, SK, n.d.).

⁴¹ Daintree, Interview with 15 Wing Current Operations Officer Maj J. Daintree 2018-2022 OPS O, 2014-2017 Wing Stds O, 2010-2014 CFS Det Comd.

surface ice build-up. The SNIC operation at 15 Wing was subcontracted from the prime contractor. Significant delays in flying operations were experienced throughout NFTC due to the sub-contractor either not commencing SNIC until snow accumulation was stopped or a chemical agent was not applied before a freezing precipitation event was to occur.⁴² The subcontractor also did not operate during weekend hours; if a precipitation event happened over the weekend, the clearing of snow and ice would commence in the early hours of Monday morning and would usually cause delays or cancellations to the morning flight schedule.⁴³ Cost savings and profitability to the prime contractor and subcontractor are the prime factors for the limited availability of SNIC on the aerodrome.

Infrastructure Management Lessons

Alternate Service Delivery (ASD) contracts can be a very effective and cost-saving tool for the CAF. Services without immediate or significant impact on operational effectiveness can be divested to a contractor and possibly subcontracted. However, necessary operational ASD contracts must stay within the arm's reach of the CAF to have the ability to influence or negotiate required changes directly and immediately should a situation change. Contracted entities do not have a long-term outlook for infrastructure that is not under their vested ownership and will not put the benefit of the RCAF and nation before profits. Therefore, the RCAF must have authoritative control of contractor and subcontractor contracts that directly affect operational output to ensure it can adapt and modify those contracts to maintain operational control and effectiveness. The CAF has retained some direct ASD services, such as accommodations and messing. NFTC attempted to push that boundary into the operational space, but it proved unsuccessful; therefore, it must be corrected the next time. Direct operational impact services must be within arm's reach; all other non-essential, non-operational ASD should or can be subcontracted by the Contractor.

PART THREE – INTERNATIONAL PARTICIPATION & STANDARDS

The NFTC program initially attracted numerous participating countries with the civilian contractor concept. It leveraged a strong Canadian flying training reputation and past success in NATO flying training in Canada in the 1950s and 60s.⁴⁴ The UK, Italy, Singapore, Hungary, Germany, and Denmark were all early supporters and participants of the NFTC program.⁴⁵ The promise was to produce world-quality military pilots trained in current tactics to prepare them for operational military flying. The initial concept was sound but needed better execution. Soon after the first few years, the writing was on the wall that the promises made early on would be difficult, if not impossible, to keep. Midway through the program, some trial-participating nations, including Australia and the Kingdom of Saudi Arabia, attempted to join the program. Unfortunately, those trials only lasted for one course, as the exodus of the original partnering nations began to pick

⁴² Wilton, "NFTC Steering Committee Meeting Power Point Presentation."

⁴³ Daintree, Interview with 15 Wing Current Operations Officer Maj J. Daintree 2018-2022 OPS O, 2014-2017 Wing Stds O, 2010-2014 CFS Det Comd.

⁴⁴ Holman, *Best in the West*.

⁴⁵ "NATO Flying Training in Canada (NFTC)," accessed April 30, 2023, <https://www.cae.com/defense-security/what-we-do/training-centres/nato-flying-training-in-canada-nftc/>.

up steam. By the mid-2010s, only Singapore and Hungary were left in the program participating with students. Both countries will remove themselves from the program by mid-2024 (only due to COVID delays) to pursue other military training options.⁴⁶

Numerous factors were the cause of this exodus, and not one issue was the sole reason to blame; however, some of the issues were causing distress to the coalition partners. Primarily the inability of the NFTC program to graduate student pilots on time was the most common complaint from the national delegations during the yearly Steering Committee meetings, causing courses to be constantly rescheduled or delayed.^{47,48} In addition, many countries had scheduled follow-on training for their students in the United States Air Force on front-line fighter aircraft. These start dates were often missed because their students could not complete their NFTC course on time, costing the countries penalties or scrambling to find last-minute replacements. The second reason for this exodus was the drastic change to the NFTC program the 1 CAD Commander directed in 2010 to tackle the pilot retention problem with production. The CT155 was experiencing severe engine issues, and frequent fleet operational pauses dramatically reduced the program's output.⁴⁹ This led to a significant shift in the conduct of the program, with most of the flying training being done on the CT156 versus the CT155.⁵⁰ Some partnering nations did not accept this change as they thought the quality of training on a turbo propeller vs jet aircraft reduced the output quality and decided to leave the program. Denmark exercised this right as it was one of the first to depart.⁵¹

A flying Program built on shared knowledge

The original concept of NFTC was to be a shared participation and input model to ensure tactics and teaching methods were shared and remained relevant to the fast-changing technological world of military aviation. Therefore, all participating nations must approve changes to the training plans, instruction methods, and course standardization through the yearly NFTC steering committee meetings. These meetings were held on a bi-annual basis early on in the program and reduced to an annual basis halfway through the program.⁵² Technological updates to the aircraft were slow and only occurred when severe impacts to the program occurred or flight safety was compromised. This reluctance to upgrade aircraft and modern tactics, especially on the CT155, caused the NFTC program to fall behind the modern Fighter lead in training.⁵³

⁴⁶ Wilton, "Record of Decisions of the NFTC Steering Committee Meeting October 2020."

⁴⁷ Rhett Chambers LCol, "Record of Decisions of the NFTC Steering Committee. Hungary Sept 2018" (2 Canadian Air Division, September 2018).

⁴⁸ Rhett Chambers LCol, "Record of Decisions of the NFTC Steering Committee. Singapore Sept 2019" (2 Canadian Air Division, September 2019).

⁴⁹ Darlene Callaghan, "Record of Airworthiness Risk Management - CT155 Hawk Low Pressure Turbine Blade" (1 Canadian Air Division Operational Airworthiness/ CAE, 2009).

⁵⁰ AOT SET, "CT-156 Phase II and III Training Plan" (2 Canadian Air Division, 2014 2011).

⁵¹ 2 Canadian Air Division, "NFTC Steering Committee Website & Resources," 2020, <http://airforceapp.forces.gc.ca/nftc>.

⁵² 2 Canadian Air Division.

⁵³ M. Major Pistilli, "Training Standardization Vists - 419 Squadron - May 2022," 2 CAD Training Standardization Visit (Cold Lake, AB, May 2022).

RCAF's Shortsighted answer to retention led to NFTCs' modern problems

The CAF force reduction plan of the mid to late 1990s was beginning to materialize in a pilot shortage for the RCAF. The demographical structure of the RCAF in the late 2000s showed a gap in pilots with approaching 15 to 20 years of service.⁵⁴ (figure 1) This gap would produce a crunch in the number of pilots in the near future as the pilots 20 years and over were releasing at higher than anticipated rates. This, combined with the hawk engine issues, caused the 1 CAD Commander to order an increase in pilot production rates with the current equipment and input variables to remain constant. Increase the basic flying course number of student graduates from 80 to 120 per year. This order, reluctantly followed by the Central Flying School (CFS) at the time, redesigned the course with reduced flying hours and standards to meet the ordered output. (Which NFTC in 13 years since that order has been unable to obtain⁵⁵).

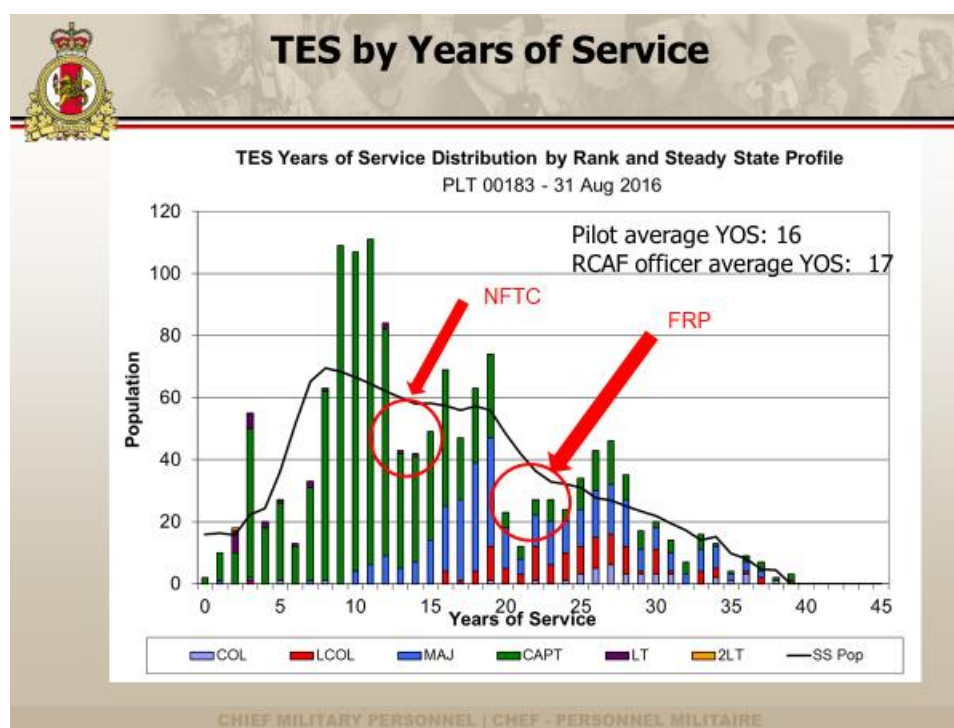


Figure 1

The partner nations who had no choice in this decision chose to leave the program, and in the case of Singapore, managed to negotiate that the CT155 course would stay the same for their students since they signed a 20-year commitment from the start. Hungary was the only nation to accept the new course and remained in the modified program.⁵⁶

⁵⁴ Fighter/Trainer Career Manager, "RCAF Pilot Career Manager Yearly Briefing - DMilC" (Moose Jaw, Sk, 2016).

⁵⁵ 2 Canadian Air Division, "NFTC Steering Committee Website & Resources."

⁵⁶ 2 Canadian Air Division.

Training Command Structure and Standards

Since the change to the NFTC program imposed in 2010, the command structure and standardization methods have changed significantly over the next ten years. Since flying training began in Canada with BCTAP, flying schools have always had outside organizations monitor standards.⁵⁷ Before 2012, CFS was under the A7 at 1 CAD and observed standards and training across the pilot trade on all platforms. In 2012 it was deemed that training was so extensive that all air force initial trade qualification training would fall under a 2 Canadian Air Division (2 CAD), separate from the operational side of 1 CAD. CFS moved over to 2 CAD and was soon disbanded in 2014 to stand up a Wing standards section for local standardization. A Standards and Evaluation Team (SET) was set up in 2 CAD as the ultimate authority. In 2018 The wing standards cell was disbanded at 15 Wing to use the positional numbers to be moved to create an operational support squadron.⁵⁸ In those ten years, the NFTC program had completely lost any direct on-site outside oversight for standardization. The only remnant remaining is the SET which is based in Winnipeg at 2 CAD and only visits approximately once per month.

Removing the echo-chamber

Canada is no longer an expert in flying training as it once was. Our experience and expertise have dwindled.⁵⁹ Bringing ideas, tactics, and processes from other perspectives is required to remain relevant. Strong Secure and Engaged (SSE) has been pushing the importance of diversity and the strength that it brings to organizations.⁶⁰ Unfortunately, the NFTC program and RCAF have moved away from this, causing partner nations to exit and removing all input, opinions, and oversight from standardization organizations. The ENJJPT program is the ideal example at the moment. A coalition of nations coming together to train jet pilots to a common standard used across NATO, with all participating countries bringing something to the program to ensure interoperability.⁶¹ Canada is luckily also a partner in the program; due to the shortfall of NFTC, students have begun to be sent to ENJJPT to make up some shortfall and to anticipate the cessation of the CT155 operations in 2024.⁶² ENJJPT is what NFTC was envisioned to be, but unable to execute due to the loss of control by the RCAF in keeping standards and falling prey to shortcuts, easy solutions, and profit-driven decisions.

⁵⁷ Holman, *Best in the West*.

⁵⁸ Daintree, Interview with 15 Wing Current Operations Officer Maj J. Daintree 2018-2022 OPS O, 2014-2017 Wing Stds O, 2010-2014 CFS Det Comd.

⁵⁹ "Canada's Air Force Is Losing Too Many Experienced Pilots — and the Clock Is Ticking - National | Globalnews.ca," Global News, accessed April 30, 2023, <https://globalnews.ca/news/4945534/canada-air-force-pilot-shortage/>.

⁶⁰ National Defence, "Strong, Secure, Engaged: Canada's Defence Policy," policies, September 22, 2017, <https://www.canada.ca/en/department-national-defence/corporate/policies-standards/canada-defence-policy.html>.

⁶¹ "Euro-NATO Joint Jet Pilot Training Program (ENJJPT)."

⁶² Wilton, "Record of Decisions of the NFTC Steering Committee Meeting October 2020."

Return of Diverse Input and Oversight

The FAcT program may accommodate an international partnership at some point. The RCAF must first retain operational control of the program to train Canadian pilots first and foremost so that reconstitution can occur.⁶³ However, regarding syllabus development and program execution, having diverse points of view from partnered coalition air forces can always bring a perspective that was not seen or thought of and can help tackle problems. The SET should look into setting up a detachment at 15 Wing Moose Jaw to ensure on-site standardization and ensure contractor adherence.

PART FOUR – WHAT NFTC GOT RIGHT

The list of failures of the NFTC program is indeed a lengthy one. However, some parts of NFTC should be copied in the future FAcT contract. The most notable success observed was employing civilian aircraft maintenance, aviation life support equipment (ALSE), and ground crew personnel vice military personnel. The support personnel listed above are the most significant members of an aviation Wing. The constant turnover from military postings makes it challenging to maintain a certain level of experience and efficiency when there is a continuous requirement to train new personnel. However, this retained experience resulted in increased productivity and efficiency. This was noted the most during daily aircraft malfunctions and maintenance needs (SNAGS). The technicians' experience working on the same aircraft for multiple years results in a knowledge base that results in quick diagnosis and repairs.⁶⁴⁶⁵ This can be expanded to ALSE technicians and grown crew as well. This efficiency translates to fast aircraft turnaround and reduced military personnel postings, and training savings for the CAF.

Ground School and Simulator Training

A second aspect which has served NFTC well and is used across the RCAF in various training units is the use of civilian ground school and simulator instructors. These instructors are often retired former RCAF members with vast knowledge and experience willing to share with the younger generation. RCAF personnel formerly filled these positions before NFTC and would remove able and fit flying pilots from teaching students in aircraft. The employment of these members frees the RCAF instructor pilots to teach airborne and thus use their time more effectively. The civilians in the ground and simulator training, like the maintenance personnel, have a low turnover rate and produce quality instruction.⁶⁶⁶⁷ This reduces instructor training costs and ensures knowledge is passed and retained.

⁶³ National Defence, "CDS/DM Directive for CAF Reconstitution," August 11, 2022, <https://www.canada.ca/en/department-national-defence/corporate/policies-standards/dm-cds-directives/cds-dm-directive-caf-reconstitution.html>.

⁶⁴ Wilton, "Record of Decisions of the NFTC Steering Committee Meeting October 2020."

⁶⁵ Pistilli, "2 CFFTS Flying Training Evaluation Report," October 2021.

⁶⁶ Pistilli.

⁶⁷ Pistilli, "2 CFFTS Flying Training Evaluation Report," December 2018.

A trial has been ongoing at NFTC since 2020 to employ ten contracted flying instructors. These instructors are like the simulator instructors, former RCAF pilots with training experience. As of this essay, this trial is ongoing and has been a success, with most instructors currently employed at the flight instructor school forming the newest cadre of instructors.⁶⁸ This model will be leveraged and increased for the FAcT program to reduce the demand for the operational RCAF units and the need to send back instructors. This will need to be monitored, as the need for RCAF instructor pilots will still be required and should be entirely replaced. The RCAF cannot and should not divest itself entirely of this capability, as it is necessary for the RCAF to maintain its standard and to be able to lead the unit effectively.

CONCLUSION

The RCAF has had a long tradition and impact on military flying training since the establishment of the BCTAP program and throughout the remainder of the 20th century. Canada is a contribution warfare nation and is not expected to wage war alone. We should leverage our strengths to help support our NATO allies and work together to all our benefit. That was the vision of the NFTC program at its inception. It is an idea with good intentions that could have been better executed due to its rushed nature and focus on pure commercial opportunity vice the betterment of the RCAF, partner nations, and its aviators. After 23 years of operation, the program begins to wind down, as a successor program will take place in five years. These past 23 years have yielded lessons on its successes and shortcomings. These lessons should be used wisely. This essay focused on the primary operational deficiencies and recommendations for the FAcT program or future iterations. These recommendations are tabled below. (Table 3)

Table 3 – Lessons Learned Recommendations

Recommendations	
Aircraft Resourcing	1. Increase the number of aircraft to ensure a minimum student-to-aircraft ratio of 4 to allow allowances for taskings and unforeseen circumstances.
	2. Ensure the Government of Canada owns the Aircraft fleet to enable complete control of airworthiness and operation limitations of the aircraft.
	3. Project Office to extensively wargame each proposed future solution to ensure several future scenarios are accounted for.
	4. Continue ASD of aircraft maintenance, ALSE, ground school and Simulator instructors to free up military personnel to fly, and remain on operational units.

⁶⁸ Pistilli, “2 CFFTS Flying Training Evaluation Report,” October 2021.

Infrastructure	1. Ensure the Government of Canada and CAF have direct control and input to contracts that affect Operational effectiveness. (not sub-contracted through a primary contractor)
	2. The Government of Canada and CAF retain direct control of base infrastructure and direct its preventative maintenance and upgrade requirements.
Standards & International Participation	1. Re-establish coalition participation in the program to ensure a diverse input of tactics, ideas, and methods to improve the program continuously.
	2. Re-establish direct standardization oversight by having an on-site SET at 15 Wing Moose Jaw to monitor school and contractor performance continuously.

Aircraft are the tools required to get the job done for the RCAF. Similar to a mechanic, if there are not enough tools to complete a tasking, the job will be done with delays and possibly not in a correct way when time or external pressures are applied. The same mindset must be applied to pilot training. Without enough aircraft or complete control of those aircraft, when external or time constraints are applied, shortcuts will be sought, and sometimes with disastrous consequences. As was the case of a CT156 in 2014 when the flight safety investigation noted the lack of training and practice that the instructor received and felt pressure to take a student in less-than-ideal weather conditions, causing an ejection and loss of aircraft.⁶⁹ As with the operational planning process, ensure that any future contract proposal is extensively war-gamed to ensure any likely issues and some unlikely scenarios are accounted for and can be dealt with reasonably to ensure continued operational effectiveness.

Infrastructure must remain under the complete control of those invested in it. Just as a renter will never maintain or care for a housing unit as much as an owner, the government must control and invest in its infrastructure to ensure the maximum value is obtained from its lifetime. Contracting services for the maintenance of said infrastructure is an excellent way to save staffing and monetary resources; however, when operational effectiveness is at stake, the CAF must be within arms reach of the contractor to be able to adjust and modify service delivery to ensure it can continue to operate in a constantly changing operationally demanding environment.

Finally, to re-establish international partnerships for military flying training and ensure standards are kept and met. International partnerships are vital to modern military operations, ensuring safety in numbers, force, credibility, and interoperability. As diversity is shown to be essential, ensure the CAF is provided with different perspectives to ensure we get the best possible solution. The same should be applied in military flying

⁶⁹ Royal Canadian Air Force National Defence, "CT156102 Harvard LI - Epilogue - Flight Safety - Royal Canadian Air Force," not available, January 24, 2014, <https://www.canada.ca/en/air-force/corporate/reports-publications/flight-safety-investigation-reports/ct156102-harvard-li-epilogue.html>.

training, as it ensures all allies are to the same standard and provide a level of interoperability since we train to a similar standard. Ensure that standard is maintained by keeping an onsite outside standards unit to monitor this standard and contract performance.

The RCAF is in a precarious position with the ongoing reconstitution and bid evaluation for the next flying contract. Many mistakes were made in the never-ending pursuit of efficiency during NFTC; these mistakes cannot be repeated if the RCAF is to recover from reconstitution and regain its former glory and place among its NATO allies. Let's leverage the natural strengths that have served us over the past century and become an invaluable ally, which will be an essential part of future contribution warfare.

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