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ON THE COVER

Efficiency is the name of the game at Pearson airport’s Central Deicing Facility (CDF), where a typical narrow-body deicing under frost conditions generally takes less than 90 seconds. *Skies* visited the CDF on a frigid winter morning to find out how they do it.

Mike Reyno Photo



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FACEBOOK PHOTO PICK

A Wow Airlines Airbus A321 approaches Toronto Pearson Runway 23 on a late afternoon in mid-summer, after a long flight over the Atlantic Ocean. **John Chung Photo**

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Column

FROM THE EDITOR
BY LISA GORDON

Lisa Gordon is editor-in-chief of *Skies* magazine, Canada's largest and most-read aviation industry publication. Contact her at lisa@mhmpub.com.



Partnerships set the tone for 2018

Welcome to our first issue of 2018!

This industry is never boring, but last year was particularly eventful for Canadian aviation and aerospace.

A common thread running through every industry sector—whether commercial, military or general aviation—was partnerships. Indeed, industry alliances are setting the tone for a very busy new year as we wait to see how things will eventually shake out.

As Canadians, we're justifiably proud of our aerospace innovation and expertise. That skill and ability is evident when one examines Bombardier's C Series airliner. Formally launched in 2008, it is the gritty survivor of a decade spent eking out a hardscrabble existence in the unforgiving soil of commercial aviation.

In service since July 2016, the C Series is proving to be everything Bombardier promised and more; a fact that makes the development team—and we Canadians in general—extremely proud. It's not easy to

surprise to industry analysts who had long predicted such an alliance.

Then, on Jan. 26, 2018, the U.S. International Trade Commission overturned the massive duties levied against the C Series in a shocking unanimous decision that dramatically reversed Bombardier's fortunes.

What will happen next? If Boeing and Embraer succeed in cementing an alliance, they will be in one corner, with Airbus and Bombardier in the other. Eagerly circling the ring will be the Commercial Aircraft Corporation of China (Comac), which is reportedly making steady progress with its 158- to 168-seat C919 aircraft, another entrant in the race for global aircraft orders.

There is no doubt that partnerships—those announced and still to come—have set the stage for a very interesting year in commercial aviation.

they will easily integrate into the Canadian fleet. After all, they're all old.

Still others say, "Just get on with it, already!" Torturous procurements seem to be the name of the game in Canada, with the wheels of progress mired in political muck more often than not. In any case, Canada is on the hunt for a "trusted partner" with which to do business.

And, finally, the pilot shortage is perhaps the hottest topic across the entire industry right now.

Instead of celebrating its 90th anniversary this year, the Ottawa Flying Club finds itself struggling to keep its doors open, with the school's general manager blaming the pilot shortage for his lack of qualified flight instructors. The school has reportedly turned students away because there are not enough people to train them.

Once again, partnerships could represent the solution, as the Air Transport Association of Canada (ATAAC), along with the Canadian Council for Aviation & Aerospace (CCAA), the College of Professional Pilots of Canada, and several operators, spearhead an initiative to inform more young people about aviation careers. The consortium has discovered that many flight training units are not operating at full capacity, mainly due to a lack of instructors, and it is looking at ways to encourage more young people to choose aviation-related careers, including instructing.

While all of this will take time, it is encouraging to see a pan-industry approach to managing the effects of the pilot shortage on operators large and small.

In our first issue of 2018, we're delivering more insightful content that affects your business. In addition to our C Series story, find out what operators are thinking about impending changes to fatigue management regulations; learn more about a possible Canadian ADS-B Out mandate; and find out how the Royal Canadian Air Force is recruiting the next generation.

We've also brought back our "In the Circuit" airport profile (Ben Forrest visits Edmonton International in this issue); and, of course, our cover story takes you behind the scenes at Toronto Pearson's Central Deicing Facility on a cold winter's morning. Enjoy! 🇨🇦

“IT IS ENCOURAGING TO SEE A PAN-INDUSTRY APPROACH TO MANAGING THE EFFECTS OF THE PILOT SHORTAGE ON OPERATORS LARGE AND SMALL.”

create an innovative clean sheet aircraft, pair it with brand new engine technology, and compete in an arena dominated by the likes of Boeing and Airbus. (See page 28.)

And the C Series program didn't go unnoticed by either of the big OEMs. By now, we've all read countless articles about Boeing's petition alleging dumping and unfair subsidization—and the resulting U.S. commerce department decision to slap duties of 292.21 per cent on all C Series aircraft sold to U.S. customers.

Then came the bombshell announcement in October 2017 that Airbus had swooped in to acquire a majority stake in the C Series program, forging a partnership Bombardier said would help the program succeed.

By December, Boeing and Embraer were involved in talks regarding a "potential combination," a move that came as no

Meanwhile, on the military front, Canada decided in December to ditch a plan to purchase 18 new Boeing Super Hornet fighter jets, opting instead to buy 18 used F/A-18 "legacy" Hornets from Australia.

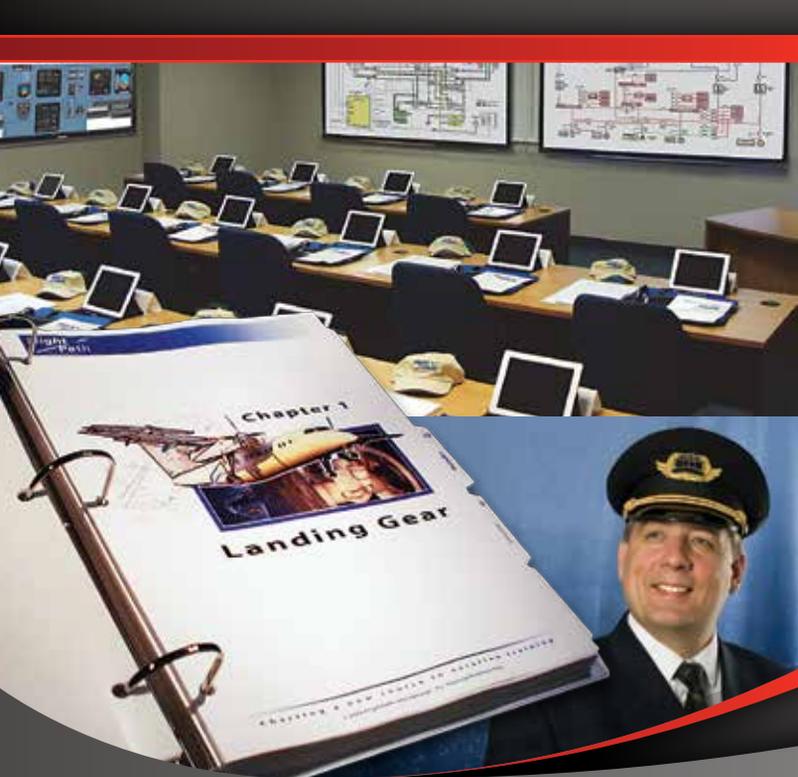
The government held its Future Fighter Industry Day on Jan. 22, where foreign governments and industry obtained information about the upcoming competition to select Canada's next fighter jet. Industry also had the chance to network with foreign governments and fighter jet manufacturers to establish potential future business partnerships.

In the meantime, where does this leave the brave men and women of the Air Force? Some say the Aussie Hornets—with the youngest airframe available nearly 35 years old—will be nothing more than a maintenance headache, while others feel

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Column

IN THE JUMPSEAT
BY KATHY FOX

Kathy Fox is chair of the Transportation Safety Board of Canada, an independent agency that investigates selected marine, pipeline, railway, and aviation transportation occurrences.



Addressing substance abuse in the aftermath of tragedy

On the morning of April 13, 2015, a Metro II turboprop departed Vancouver International Airport on a cargo flight to Prince George, B.C., only to disappear from air traffic control radar about six minutes after takeoff. When the wreckage was discovered later that afternoon, TSB investigators had few clues about the accident's cause: both pilots died in the crash, and there were no voice or data recorders on board.

Eventually, using data from ground radar and air traffic control logs, TSB investigators were able to piece together the flight path: shortly after acknowledging a clearance to climb to flight level 200, the aircraft entered a steep dive, and the subsequent extreme speed exceeded the aircraft's structural limits, resulting in an in-flight breakup (see TSB Investigation Report A15P0081).

might even have slipped into unconsciousness during the flight. Yet the TSB's investigation found no indication that the first officer was incapacitated, and he should still have been able to regain control of the aircraft.

The second scenario involves the aircraft's pitot system. If, for instance, the heaters for the pitot tubes malfunctioned—or if the pilot's level of impairment was such that he did not turn them on—they may have become blocked with ice. And if this happened while the aircraft was in cloud, the crew may have inadvertently initiated a descent while trying to find out what was happening with their flight instruments. The initiation of that kind of a descent, however, would have been unlike the rapid, almost vertical flight path followed by this aircraft—

any disposition toward such an act.

Ultimately, it could never be determined exactly why the aircraft entered such a steep dive that day. Nonetheless, there is a clear need to address the risks of impairment among employees in safety-sensitive positions.

One option, favoured by countries such as the United States and Australia, is mandatory drug and alcohol testing. This has been shown to be most effective when complemented by other initiatives such as education, employee assistance programs, rehabilitation and return-to-duty programs, and peer support.

Currently, there is no similar requirement for such programs within the Canadian aviation industry. And although Transport Canada regulations prohibit flying while impaired, these rely heavily on self-policing. Yet, previous TSB investigations have shown that self-policing is not enough; drugs and alcohol are simply not conducive to making sound decisions, especially about whether one is fit to fly.

The TSB acknowledges that employees within Canada's aviation industry will have concerns under any possible testing regime here, and those concerns are understandable and must be addressed. At the same time, the regulator and the operators must also consider public safety.

That is why the TSB recommends a comprehensive approach, not "just testing."

We are calling for Transport Canada, in collaboration with the Canadian aviation industry and employee representatives, to develop and implement requirements for a comprehensive substance abuse program—including drug and alcohol testing—to reduce the risk of impairment of persons while engaged in safety-sensitive functions. These requirements should consider and balance the need to incorporate human rights principles enshrined in the *Canadian Human Rights Act* with the responsibility to protect public safety.

Such a program would contribute to reducing the risk of impairment on the job while also providing help to those employees with substance abuse problems. That's a win for all concerned; and hopefully, one that happens before more lives are lost in needless tragedy. ■

“ALTHOUGH TRANSPORT CANADA REGULATIONS PROHIBIT FLYING WHILE IMPAIRED, THESE RELY HEAVILY ON SELF-POLICING.”

But knowing what happened in an accident is only the first step; just as important is finding out why. That's where another piece of information proved critical: a toxicology report from the coroner showing that the captain had a blood alcohol content of 0.24—meaning he had consumed a significant amount of alcohol on the day of the occurrence.

Taking this into account, investigators narrowed down the list of possible scenarios to just three. Although each one still leaves unanswered questions, each also has a common element: alcohol.

The first scenario is pilot incapacitation. Based on the captain's high blood alcohol content, his physical and mental performance would have been significantly impaired. He

which should have been immediately, physically apparent to the pilots.

The third scenario involves the possibility that the aircraft was intentionally placed into the steep dive. The investigation identified several flight-specific factors consistent with this, including: the aircraft's descent in the direction of flight, its full nose-down trim setting, the duration of the dive, the absence of any type of emergency communication, and the absence of any apparent recovery action during the descent. Moreover, post-mortem examination revealed that the captain exhibited physical-health indicators of long-term heavy alcohol consumption, which is associated with increased risk of suicide. The investigation, however, was unable to establish whether the captain had

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Column

VIEW FROM THE HILL

BY KEN POLE

Ken Pole has had a life-long passion for aerospace, writing about all its aspects for nearly 40 years. The longest-serving continuous member of the Canadian Parliamentary Press Gallery, he's also an avid sailor.



Countdown to CORSIA

It's been almost two years since an international government and industry task force drafted new carbon dioxide emissions standards, a key element of the International Civil Aviation Organization's (ICAO's) "green" agenda.

ICAO machinery being what it is, it took nearly a year for the United Nations agency to thrash its way to a consensus on the concept—dubbed the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)—last March. The emphasis was on how to "encourage" technological developments which would shrink the industry's emissions footprint before mid-century, even as global traffic continues to expand.

Canada has committed to curbing its emissions of CO₂ and other greenhouse

a driving force behind the consensus, noted that air transport is "the first industry sector globally to adopt a CO₂ emissions design certification standard."

(For the record, the Nigerian has the credentials to make it work. They include a doctorate in aeronautical engineering from the Kiev Institute of Civil Aviation Engineers in Ukraine, an aircraft maintenance engineer's licence with multiple ratings, and ICAO certification as a safety management systems instructor. He also has an IATA diploma in civil aviation management and is a McGill University graduate in air and space law.)

CORSIA will apply to post-2020 new aircraft types and then to designs already in production as of 2023. Aircraft which don't comply by 2028 would effectively

personnel will be needed, Transport Canada replied by email that CORSIA "will be implemented and administered with existing resources" as set out in the 2016 federal budget. The \$56.9 million budgeted over two years "to support the transition to a cleaner transportation sector" covered not only aviation but also marine and rail transport, and no breakdown was provided.

As for whether ICAO or the UN Environment Program will co-ordinate data collection to ensure compliance, the response was that while states are responsible, ICAO would "have a role in collating some data to provide global information upon which annual carbon offsetting obligations will be based."

The rubber hit the runway when I asked Transport about costs.

"States will be responsible for costs related to implementing ... the regulations, overseeing compliance of their operators, and reporting required information [to ICAO]," the agency replied. "Operators will be responsible for costs related to monitoring, reporting, and verification requirements, as well as requirements to acquire and cancel carbon offsets. Airports have no role."

So, then, what other departments and/or agencies are involved?

"Transport Canada leads ... and involves other departments as necessary," it replied, pointing out that they are "consulted on issues directly related to their mandates." Those included Environment and Climate Change.

"The government ... also regularly consulted with the aviation industry."

Does CORSIA require any proof of concept or pre-operational trials?

Transport said it is now involved in a "multi-state small-scale implementation project to test the requirements and guidance material with a small number of operators and states."

There you have it. Fingers crossed! I think we all appreciate the "green" objective, but I think we may be dreaming in Technicolor. ■

“CORSIA WILL BEGIN VOLUNTARILY IN 2021 BUT IS SLATED TO BECOME MANDATORY IN 2026.”

gases such as methane, nitrous oxide and ozone by 17 per cent (from 2005 levels) by the year 2020. This ostensibly would make us "carbon neutral" by 2020 before we can move to absolute reductions by 2050.

It's an ambitious initiative costing billions. The clock is ticking, and bureaucratic clocks tend to tick slower than most.

Yet the Aerospace Industries Association of Canada (AIAC), which was involved in the ICAO task force, promises that its members will be in compliance with the new standards when they come into effect.

More broadly, the International Business Aviation Council, which shares ICAO's Montreal headquarters building, is onboard, as is the International Air Transport Association (IATA) across the street.

When CORSIA was unveiled, ICAO Council president Olumuyiwa Benard Aliu,

be prohibited from flying. The standard would apply to operators emitting more than 10,000 tonnes of CO₂ annually on international flights, by aircraft with a maximum takeoff mass less than 5,700 kilograms. Flights for humanitarian, medical and firefighting purposes would be exempt, as would helicopter operations.

CORSIA will begin voluntarily in 2021 but is slated to become mandatory in 2026. Significantly, the 65 member states which first agreed to cooperate would be responsible for some 80 per cent of the growth in global CO₂ emissions in those first five years.

It's an ambitious undertaking, especially for Canada, where average distances flown are significantly greater than in most other countries.

Asked what monitoring hardware, reporting requirements and potential

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- Nathan Grindstaff, Board Member, Mastercorp
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Column

FOCAL POINTS BY TONY KERN

Editor of the *Controlling Pilot Error* series, Tony Kern is one of the world's leading authorities on human factors training in aviation. A former lieutenant colonel in the U.S. Air Force, he served as chief of Cockpit Resource Management plans and programs at the USAF Air Education and Training Command. He is author of three bestselling aviation books: *Redefining Airmanship*; *Flight Discipline*; and *Darker Shades of Blue: The Rogue Pilot*, all from McGraw-Hill.



Why we don't comply

Do you ever wonder why following the rules is so hard?

Let's look at three concepts to start unravelling this dilemma.

First, noncompliance with standard operating procedures (SOPs) and regulations is cited in a variety of studies as a contributing factor in well over 50 per cent of aviation mishaps. Secondly, there was a time at the very beginning of all of our careers when we were fully and voluntarily compliant. Finally, very, very few of us come in to work on any given day *intending* to break the rules.

So what happens?

To begin, let's be honest with ourselves about the scope and breadth of the problem. For the past two decades, I have relentlessly researched the noncompliance phenomena. Using anonymous response technology, I



“IT'S NOT ABOUT MEETING STANDARDS AND EARNING A PAYCHEQUE. IT'S ABOUT PERSONAL FULFILMENT.”

have asked over 10,000 pilots, maintainers, and dispatchers this simple yes or no question: “In the past 60 days, have you willfully violated an SOP or regulation?”

Shockingly, over 75 per cent answered “yes.” Similar statistics come from other high risk industries such as law enforcement, firefighting, and healthcare.

Digging deeper, I've discovered a few commonalities behind this epidemic.

Previously, I have written about violation-producing conditions such as time pressure, normalized deviance, mission demands, workload management, and distraction. I won't repeat myself here. Instead, let's look at ways to get back inside the lines.

I've come to believe that it rests with two issues: How we train and how we view ourselves as professionals. And it all

revolves around a single word: *motivation*.

Here are a couple of counterintuitive ideas for us to try.

Stop training for compliance. With the statistics cited above, this idea may seem ludicrous. But there is more here than meets the eye. Traditionally, we oversimplify compliance training. *These are the rules, follow them all, it is a condition of your employment.*

Over time, cultural influences, poor role models, and a lack of consequences for deviations creep in, leading to sloppiness that spreads throughout even the best-intended organizations with robust safety management systems.

Here's a new idea. Rather than focusing on compliance, let's promote continuous personal and professional growth, not

simply to ensure continued employment, but rather as the means to a fully engaged, satisfying career and life.

Stop striving to meet standards. To get to this point, we need to change the way we view performance. It's not about meeting standards and earning a paycheck. It's about personal fulfilment. There's a big difference in motivation between “I won't get caught” and “I'm getting better every day.”

We've all experienced something in our lives for which we have enough passion to devote considerable time, energy, and often money to improve our skills. Maybe it's fitness, golf, or learning to play the guitar. This same energy must be transferred to our profession to become, once again, fully engaged. Mere compliance becomes an afterthought at this point, as we are operating effortlessly and intentionally above the bar.

In summary, we need to do something different to address the noncompliance challenge.

Perhaps less emphasis on standards, safety, and quality assurance and more focus on motivating personal development is a place to start. ■

The image shows two F-35 Lightning II fighter jets in flight. One jet is in the foreground, flying towards the viewer, while another is further back and higher up. They are flying over a city at sunset, with the sun low on the horizon, casting a golden glow over the scene. The city buildings are visible in the lower part of the frame, and the ocean is visible in the middle ground.

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Diamond Canada set to soar in 2018 with 3 production lines



Diamond Canada now owns the type certificates for the seven-passenger DA62 (shown), as well as the single-engine DA40. **Diamond Canada Photo**



• **Lisa Gordon**

OEM News

It's been a year of transition for Diamond Aircraft Industries (a.k.a. Diamond Canada) in London, Ont.

Just before Christmas 2017, China-based Wanfeng Aviation Industry announced it had completed the acquisition of the Canadian company's Austrian parent, Diamond Aircraft Group.

The news came just one year after Wanfeng acquired a 60 per cent controlling interest in Diamond Canada at the end of 2016. As part of that deal, all rights for two aircraft models—the four-seat DA40 and the seven-passenger DA62—were transferred to London.

“Diamond Canada purchased the DA40 and DA62 programs from our Austrian colleagues,” explained Peter Maurer, the company's president and CEO, in

a recent interview with *Skies*. “That means Diamond Canada now owns the type certificates for those aircraft and is responsible for global sales and all in-service support.”

When the type certificates were transferred to Diamond Canada on Nov. 15, 2017, the DA62 and the DA40NG automatically attained Canadian certification.

“We can now make design changes to those aircraft,” continued Maurer, adding



There are currently three aircraft models being built in London: DA20, DA40, and DA62. Shown here is a DA40 (foreground) and a DA62 in final assembly. **Diamond Canada Photo**

that Diamond Canada will be focusing on modifications that appeal to the North American market.

The DA40, Diamond's best-selling aircraft, is targeted for some product improvements, although Maurer said the DA62 will stay as-is for now.

"The DA62, we don't see a need to make any design mods now. The aircraft meets anybody's standard. It comes with all the avionics anyone would want and the comfort features."

HIRING MODE

With three aircraft production lines now running in London (DA20, DA40, DA62), Diamond Canada is busily searching for good people to help the factory meet order book demand.

"It's been an absolute growth year," said Maurer. "2017 has been very challenging for us in terms of hiring the people we need. We're behind our hiring plan. We have over 180 people now, but it's not enough in terms of our sales."

In total, he said the London factory will need about 300 staff by December 2018.

"A lot of people in aviation are looking for technicians and pilots. In our case, we're also looking for production workers. They don't necessarily need an aviation background. In essence, we look for people with a great attitude and we'll teach them the skills.

"If we can't find all the people we need, we'll have to look at outsourcing some of the work or sharing resources with Diamond Austria."

While the first DA40s completely produced in Canada have come off the production line—as has the first Canadian-built DA62—the London factory continues to operate at a lower production rate due to incremental ramp-up and staff shortages.

To complicate matters further, the DA62 is by far the most complex airplane Diamond has ever brought to market, necessitating more labour hours to build each aircraft.

"We are working with Diamond Austria to help us produce some of these aircraft because we can't keep up with the demand," said Maurer.

So far, Diamond has delivered more than 70 DA62 aircraft, which are proving to be popular primarily with private buyers.

"The aircraft is a 10," said Maurer. "Universally, the feedback on the DA62 has been great in North America. We don't have anyone saying they wished it did this or that."

He said the new diesel-powered twin extends the piston market upwards with its impressive useful load and seven seats.

"I had a chance to fly in one of our DA62s from London to Ottawa. It took 90 minutes and we burned 23 gallons of jet fuel. Since it's so fuel efficient, it needs to carry only a fraction of the fuel load that others carry. Full fuel payload on the aircraft is 1,004 pounds."

The aircraft is also approved in Canada for flight into known icing (FIKI) conditions.

2018 PRIORITIES

While 2017 was tough in terms of dealing with massive growth, Maurer said 2018 should be smoother as the company gets down to business.

"We want to focus on increasing our production rate. Of course, with that comes expanding our sales efforts, especially internationally. The focus is on selling worldwide."

In keeping with this strategy, Diamond Canada has signed up a network of international partners to handle sales, distribution and support.

Meanwhile, Maurer said the company will be ramping up to full production targets in 2018. ✦

Editor's Note: In mid-January 2018, Diamond Canada announced a leadership shuffle. Peter Maurer has retired as CEO to focus on global strategy and business development for Diamond Aircraft. Scott McFadzean has been promoted to the role of CEO at Diamond Canada.

Helijet selects S-76C++ for fleet upgrade

Helijet International Inc., based in Richmond, B.C., has entered into a Letter of Intent with PHI, Inc., based in Lafayette, La., for the procurement and supply of up to six newer model Sikorsky S-76C++ helicopters.

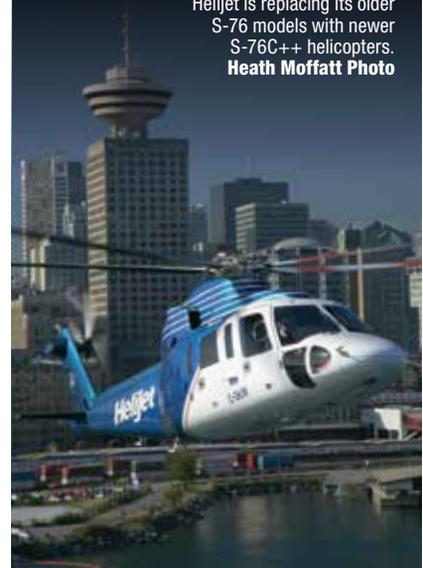
The companies have signed definitive agreements for the delivery and acceptance of the first three Sikorsky S-76C++ helicopters, which will be prepared at PHI's Lafayette maintenance facilities for delivery to Helijet during the first and second quarters of 2018.

PHI will tailor the aircraft to Helijet's specifications, including a complete re-paint to company livery, avionics changes, and selected aircraft operating equipment, prior to their integration into Helijet's fleet for scheduled and general charter operating services. Helijet will redesign and refurbish the 12-passenger cabin interiors of the three aircraft.

Additional aircraft deliveries will be subject to respective company board approvals.

"Helijet has been planning its aircraft fleet expansion and upgrade for the past 24 months, and is now committed to bringing in newer, more advanced technology to the communities it serves," said Danny Sitnam, Helijet's CEO. ✦

Helijet is replacing its older S-76 models with newer S-76C++ helicopters. **Heath Moffatt Photo**



Old story, new ending?

Airline analysts draw parallels between WestJet and defunct Canadian Airlines International



Brent Jang
Airline News

Gregg Saretsky emphasizes that WestJet Airlines Ltd. operates in a highly competitive business, remembering the industry challenges from his aviation experience dating back to the 1980s.

As WestJet charts its growth path with a healthy balance sheet, the carrier will be positioned to start routes between Canada and Asia by 2020—two decades after Air Canada completed its acquisition of debt-laden Canadian Airlines International Ltd.

“It’s tough. We operate in a very tough business on razor-thin margins,” he said during a conference call with industry analysts in December.

Saretsky, who has been WestJet’s chief executive officer since 2010, cut his teeth at CP Air and Canadian, where he worked in management from 1985 to 1998.

WestJet has been expanding since being founded as a no-frills carrier with three used Boeing 737-200s in 1996, helped over the years by increased travel to sun destinations. The carrier has gone through a noticeable growth spurt in recent years under Saretsky.

“We haven’t lost sight of that fact that it’s a tough business,” he said. “We have to be sharper than the competition. We have to come fighting and ready every day, and be mindful that costs are king.”

In 1985, Saretsky joined CP Air, the predecessor to what would become Canadian in 1987. He worked at Alaska Airlines Inc. from 1998 to 2008, before joining WestJet as vacation vice-president in 2009.

There are increasing similarities between WestJet and Canadian. WestJet is finally getting close to having a significant overseas presence, which Canadian had in the 1990s.

Canadian benefited from its strong role on Asian routes, but that was before an economic crisis hit the region in 1997, said Rick Erickson, an aviation consultant who heads RP Erickson & Associates in Calgary.

As well, Canadian folded before the travel industry enjoyed a sharp increase in traffic to sun destinations such as Florida, Mexico, the Caribbean and Hawaii, he said.

With WestJet preparing to take delivery of up to 20 Boeing 787 Dreamliners starting in 2019 or so, the stage will be set for a domestic rivalry against Air Canada to Asian destinations.

“WestJet already flies to the U.K. with the big service point being Gatwick, and

I think it will expand in Europe. But you can bet that the Canadian government is encouraging WestJet to fly into Asia,” Erickson said in an interview.

The first place that WestJet might go with its new Dreamliners could be China, or at least that country is at the top of its shortlist. “The challenge in China will be obtaining traffic rights,” said Erickson.

Calgary-based WestJet will celebrate its 22nd anniversary in 2018, long ago exceeding Canadian’s 13-year corporate existence from 1987 to 2000, he pointed out.

Given Saretsky’s work experience at Canadian, it is interesting to see that WestJet could be within two years of taking on Canadian’s model of offering full-service flying to Asia, said Erickson.

In November on the domestic front, WestJet announced a capacity purchase agreement with Pacific Coastal Airlines to bolster routes in communities in British Columbia and Alberta.

The announcement reminded Raymond James Ltd. analyst Ben Cherniavsky of Canadian’s joint venture that began in the late 1980s with Time Air of Lethbridge, Alta. “That joint venture eventually led to Canadian’s outright purchase of Time in 1991 and the creation of Canadian Regional Airlines,” said Cherniavsky in a research note in November.

WestJet and Delta Air Lines Inc., which signed an interline agreement in 2011, announced plans in December for a

WestJet has ordered 10 Boeing 787-9 Dreamliners to be delivered between 2019 and 2021, with options for 10 more. The aircraft will allow the airline to expand into Asia, South America and Europe. **Boeing Image**



There are increasing similarities between WestJet and the old Canadian Airlines International, especially now that WestJet is increasing its overseas presence.



Canada-U.S. transborder pact to strengthen their existing relationship.

“The deal also fits nicely with WestJet’s strategic evolution towards more of a full network carrier platform,” said Cherniavsky in a follow-up report in December. He added that WestJet “is bearing a closer and closer resemblance to Canadian Airlines International.”

But there will be key differences between what WestJet will look like in 2020 compared with the combination of Air Canada and Canadian in 2000, industry experts say.

After acquiring cash-strapped Canadian, Air Canada boasted a 77 per cent share of the domestic market in 2000, while WestJet’s share stood at only seven per cent back then. Air Canada’s domestic market share was recently estimated at 45 per cent, compared with WestJet’s 25 per cent.

Cherniavsky noted that Canadian was on the descent in the late 1990s, describing it as a “bloated, over-levered, high-cost airline bleeding red ink.” By contrast, “WestJet today remains one of the industry’s lowest cost, most consistently profitable airlines with an investment-grade rating and very strong balance sheet.”

AltaCorp Capital Inc. analyst Chris Murray pointed out that WestJet has plans in 2018 to launch ultra-low-cost carrier Swoop. Swoop will seek to capture “price-sensitive leisure travellers using U.S. border locations” and strive to woo traffic away from Sunwing, Air Transat and Air Canada Rouge, he said.

WestJet has bold visions for luring new business and international customers, though Murray raises a cautionary flag due to the carrier’s “lack of discussion around people and culture, particularly in light of the number of ongoing unionization issues across the organization, which high-light for us, certain key risks around implementation of the initiatives.” ❖

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New business jet sales are reportedly on hold until rules about the taxation of business aircraft for personal use are clarified.
Eric Dumigan Photo



Aircraft orders on hold due to taxation uncertainty: CBAA



Ken Pole
Business Aviation News

As the Canadian Business Aviation Association (CBAA) continues negotiations with the Canada Revenue Agency (CRA) about its plans for an explosive increase in the taxation of business aircraft for personal use, the economic fallout is evidently spreading.

CBAA president and chief executive officer Jim Facette said he knows “for a fact” that at least \$300 million in new aircraft orders is on hold because operators are uncertain about how their use for personal purposes will be taxed. Anecdotally, he told *Skies*, the stalled orders could be worth as much as \$500 million—and counting.

The fuse on the controversial issue was lit in 2012 when the CRA cancelled IT160R3, an “interpretive bulletin” in which it hiked how it calculates what it deems personal use of business aircraft.

Previously, corporate executives or shareholders permitted to use company aircraft for personal reasons would be taxed at a value equal to the cost of an equivalent charter or first class airline ticket. Under the new administrative policy, the CRA wants to multiply that amount and factor in the pro-rated capital cost of the aircraft.

One scenario outlined by CBAA legal counsel sets out the potential impact for the operator of a \$32-million aircraft, which costs \$1 million annually to operate and is flown 80 hours a year for business purposes and 20 hours for personal use.

The proposed new administrative policy could mean that the value for income tax purposes would work out to \$29,200 for each flight hour of personal use. An annual liability of \$584,000, it could include \$200,000 (the 20 hours of use equalling 20 per cent of annual operating costs) and \$384,000 (a 20 per cent share of the CRA’s prescribed six per cent interest on the aircraft’s original \$32 million capital cost).

The CRA issued a draft administrative policy in 2016, and the CBAA said it provided significant input. What remains unclear is what guidance the CRA will provide for the years between 2012 and the time in which the new administrative policy would take effect.

These intervening years remain a significant concern for CBAA members.

The overall package presents a potentially significant tax liability for owners and operators, and the fundamental uncertainty going forward has resulted in the closure of some corporate flight departments as well as the suspended aircraft orders. Facette said one order involved five aircraft.

For now, the CBAA continues talks with the CRA, including a meeting between Facette and the lobby’s legal counsel, Jamieson Collins of Toronto, and the CRA’s acting director general, Alexandra MacLean, and other officials.

Facette said MacLean, who was appointed in late October, professed to have “an open mind” about the CBAA’s position but for now, he added, “it remains to be seen.” The two sides are preparing for further talks.

“We also reinforced the message that there’s an awful lot of impending business that has not been transacted yet,” he said. “It remains to be seen if there’s a true understanding with the CRA of the economics of our industry.”

“Right now, from a business perspective, Canada is a friendly country in which to register your aircraft and we want to see that continue,” said Facette. “You can imagine the economic loss—and the job loss—of not having that going forward.”

He reiterated the CBAA membership’s dislike for uncertainty, adding: “At the end of the day, this has the potential to lead into an awful lot of litigation.” That could mean considerable costs to the government for assigning Justice Department or external counsel.

Facette said the situation begs the question, “Are they tripping over nickels to collect pennies?”

There is no indication of how much the CRA expects to collect if the current situation doesn’t change.

“If they have that analysis, they have yet to share it with us,” said Facette. “Suffice to say that this issue has garnered a great deal of attention,” including that of the two top senior CRA officials, Commissioner of Revenue Bob Hamilton and Deputy Commissioner Nancy Chahwan.

The ongoing debate also has drawn in the Canadian Bar Association and tax lobbies.

Although Facette joined the CBAA only a week before the meeting with MacLean and the other CRA officials, his 18 years as a lobbyist, including six years as president and CEO of the Canadian Airports Council, have given him insight into how government works.

He agreed the CRA’s position on corporate aircraft is a good example of the “law of unintended consequences,” in that decisions are sometimes made without much thought as to their real-world application.

“Ask anybody in any industry: they would like a ‘whole of government’ approach,” Facette told *Skies*. “I don’t think that’s necessarily new. This would stop the silo effect . . . Environment, Transport, CRA, Industry should apply policy holistically. Any industry would love that.

“That said, these are tax officials and the agency narrows in on their scope . . . so we’ll see how it goes. I would hate to speculate. The CBAA board has impressed on me that this is a high-priority item and that the staff and I have to do whatever we need to do to reinforce our position.

“We appreciate that some people at the CRA are, in their view, just doing their job,” he continued. “We get that. But having said that, when they do this kind of thing, it would have been nice had the policy been developed in consultation. That said, we have to push every button that we can as a lobby organization and we will, to make sure that this comes to a resolution that the industry can live with.” ❖

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In the last 20 years, aircraft technology has progressed significantly, yet the curriculum being taught in maintenance programs has not kept pace. An industry consortium is aiming to close that gap. **Patrick Cardinal Photo**

 Watch the video [here!](#)



Work integrated learning program bridges the gap

Air Canada is part of an industry consortium trying to bring aviation maintenance students up to speed on next-generation technology.



► **Ben Forrest**
MRO News

Next-generation aircraft like the Boeing 787 Dreamliner and the Bombardier C Series, as well as the introduction of the Boeing 737 MAX, are at the heart of a massive transformation of Air Canada's fleet.

But as those new aircraft begin to come online, the airline is seeing a gap between the skills young aviation maintenance engineers (AMEs) are learning in college, and the knowledge they'll need in the real world.

"Changes in technology have become exponential," said Boyd Parsons, general manager, Excellence 5.0, for Air Canada.

"So the gap between the curriculum of what they teach in college and what is actually being worked on in the industry continues to grow wider and wider."

That, coupled with the expected retirement of a great number of AMEs over the next few years, and a looming shortage of replacements, has prompted Air Canada to create a new work integrated learning (WIL) maintenance program to help bridge the gap.

"Through technology, systems have become so integrated, where you can't really say, 'This is where aircraft



Students from Air Canada's work integrated learning program for aircraft maintenance engineers inspect an aircraft cabin while on a work placement. **Air Canada Photo**

maintenance starts and stops, and avionics starts and stops," said Parsons.

"It's become one and the same ... the technology is certainly a much better product, but the curriculum in the colleges has not changed to reflect those changes."

Air Canada is part of a consortium led by the Canadian Council for Aviation and Aerospace (CCAA) in a federally-funded WIL initiative that will see students alternate between in-class sessions and

real-world placements.

Air Canada and other employers who hire students for WIL are eligible for wage subsidies, and the students will be exposed to some of the industry's most advanced technology—including all of the aircraft types in Air Canada's mainline fleet.

"These are all aircraft types that they would not get exposure to in the two-year [college] program that exists today," said Parsons.

In addition to the Dreamliner and 737 MAX, students will work on all of Air Canada's Airbus products, including the A319, A320, A321 and A330; as well as the Embraer E190 and Boeing 777.

"Some people are attracted to specific sectors such as helicopters or general aviation," he added. "But certainly there's a significant percentage that aspire to work on the commercial aircraft types, such as the Boeing 787."

The industry consortium consists of nine companies and will partner with colleges across the country. Air Canada will be working with Fanshawe College in London, Ont.; Canadore College in North Bay, Ont.; Centennial College in Downsview Park, Ont.; École nationale d'aérotechnique in Saint-Hubert, Que.; and British Columbia Institute of Technology in Burnaby, B.C.

Although the consortium's long-term plan is to develop a four-year program at each of those schools, Air Canada has already begun tapping into their existing two-year AME programs.

This past September, a group of 49 AME students who had completed their first year of college began work placements at Air Canada facilities in Toronto, Montreal and Calgary. Those placements are expected to last 15 months, and students will return to school in 2018, said Parsons.

The planned four-year program would conceptually be four semesters of study interspersed with four work terms, with each work term lasting about six months.

Air Canada hopes the program will attract the best and the brightest students, including women and members of Aboriginal communities.

"Diversity is something that we're very focused upon," said Parsons. "We hope the WIL program will encourage young people to pursue a career they would not have considered before."

The knowledge gap is in part a product of approved Transport Canada curriculum that leans toward general aviation rather than the latest technology in commercial aviation, said Parsons.

"If we go back 20 years ago, there was not a lot of difference in terms of the theory of systems [from] general aviation to commercial," he said.

"In the last 20 years it's changed significantly, yet the curriculum has not changed its fundamentals."

It is difficult for colleges to keep pace, he added, noting a Boeing 787 Dreamliner sells for \$200 million.

"The solution that we see is working with the educators and integrating this

new technology," he said. "The industry becomes an extension of the learning experience, which is what drove us to the WIL model."

Parsons could not say how many students the Air Canada WIL program will be able to accommodate at a given time, and could not reveal how many students Air Canada hopes the program will generate over the next 10 years.

CCAA estimates Canada will need 5,300 new aircraft mechanics and aircraft inspectors between 2016 and 2025, and plans to fund 1,000 WIL placements throughout the industry over the next four years.

Given the shortage, Parsons acknowledged it's never been more important to inspire young people to pursue this kind of work.

"It's an opportunity for our very experienced, talented workforce to pass on knowledge," he said.

"For the youth that are in the program, it's an opportunity ... to work with a major airline, to give them the opportunity to demonstrate their knowledge, their skills, their abilities and their behaviours, and be able to show what they can offer for possible future employment.

"It's a partnership between the union and the company," he said. "So it's a win-win-win-win program." ✦



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New Twin Otter sim replicates land and water ops

Viking Air believes simulator business case is “strategic and long term.”



By Howard Slutsken
Simulation and Training News

On Dec. 21, 2017, an industry milestone was achieved with Transport Canada’s approval and qualification of the world’s first “Level D” Twin Otter simulator for Pacific Sky Aviation in Calgary.

Designed and built by the Montreal branch of TRU Simulation + Training, the Viking Twin Otter Series 400 simulator faithfully reproduces the characteristics of the iconic Canadian twin-turboprop utility aircraft, both on wheels and amphibious floats.

“The exciting aspect of this Twin Otter simulator is the integration of water, air and ground models,” said Michael Coughlin, CEO of Pacific Sky Aviation,

in an interview with *Skies*. “There was a lot of groundbreaking work done by TRU, with support from Viking and Canada’s National Research Council, to understand and develop the physics about how the amphibious Twin Otter performs.”

Level D simulators have the highest capabilities of any full flight simulator (FFS), allowing pilots to obtain type ratings in sophisticated aircraft, with zero time spent flying the actual plane.

The realism of a Level D sim has to be experienced to be believed, with incredibly detailed visual displays, a full-motion base that responds to the pilot’s inputs, and accurate sounds for every phase of flight.

A marriage of marine and aviation simulation technology was critical to give

pilots a realistic training environment that includes both air and water operations in the Twin Otter.

“The simulator has all the features of a Level D simulator in the wheeled version, which is going to delight our customers. Beyond that, it will have seaplane capabilities to replicate undocking, water taxi, takeoff and landing—with a variety of wind and water conditions, docking and ramping, and wheeled amphibious taxi operations,” said Coughlin.

Since no regulatory standards currently exist for qualification of a seaplane sim, Coughlin explained that while the sim will initially be Level D qualified only in the wheeled configuration, “Pacific Sky is in discussion with several regulators, and there is a high interest in pursuing this project to establish the standards for seaplane qualification.”

Victoria’s Viking Air Ltd. has built more than 135 new Twin Otter Series 400s since restarting the aircraft program in 2007, with about 20 per cent operating on floats. Given such a small base, the huge investment needed to create the sim might be difficult to justify.

Not so, explained Dave Curtis, president and CEO.

“The business case for a Twin Otter full-flight Level D simulator is strategic and long term. As the OEM, this makes sense to us. This investment will help promote sales, increase safety and protect the Twin Otter brand,” he said.

Operators of “classic” Series 100, 200 and 300 Twin Otters are also interested in Level D training. And with markets emerging for the plane in locations such as China, Viking can help operators make a smooth and safe entry-into-service for new Twin Otter fleets.

“We wanted to be able to offer our customers the highest possible training experience that would enhance operational safety. We also knew that pilot shortages were looming, and our operators would benefit from the training offered by a simulator to help produce pilots needed for their operations,” said Curtis.

Also based in Victoria, Pacific Sky Aviation is Viking’s training partner for the Twin Otter and the worldwide fleet of Viking CL-215T and CL-415 waterbombers.

While floatplane pilots will train in simulated, high-resolution reproductions of Victoria and Vancouver harbours, and on nearby Cowichan Lake where glassy water landings can be practiced, Coughlin said that pilots will still need actual time in a float-equipped Twin Otter.

“Pacific Sky will soon be able to train pilots on various seaplane techniques under a variety of conditions. But due to the challenges of real-life operations, actual on-aircraft training will still be required for customer-specific seaplane operations,” he said.

Watch out for that kayak! 🐉



The Viking Twin Otter Series 400 “Level D” simulator reproduces the characteristics of the iconic Canadian utility aircraft, both on wheels and amphibious floats. **Mark Roffey Photo**



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The TSB believes the MU-2 pilot's situational awareness and judgment were impaired by a "very high" workload that likely prevented him from considering a go-around. **Bureau of Aircraft Accidents Archives Photo**

 Watch the video [here!](#)



Unstable approach linked to Mitsubishi MU-2 accident

 By Dayna Fedy
Accident Investigation

The Transportation Safety Board of Canada (TSB) has released its final report on a fatal March 2016 accident involving a Mitsubishi MU-2 twin-engine turboprop aircraft.

In a news conference on Jan. 10, 2018, TSB chair Kathy Fox said an unstable approach was a major contributing factor to the MU-2's collision with terrain southwest of its destination, the airport at Îles-de-la-Madeleine, Que. (CYGR).

The accident killed all seven people on board the aircraft, including the Honourable Jean Lapierre, former Member of Parliament, federal cabinet minister and media personality.

INCREASED WORKLOAD

With the aid of an onboard recording device, the TSB concluded that the MU-2 pilot modified his approach plan during cruise flight, delaying the aircraft's initial descent.

"This placed the aircraft above the planned descent profile and compressed the time available for the pilot to complete the required checklist activities, while monitoring the aircraft's airspeed, altitude and rate of descent, thereby increasing the pilot's workload," wrote the TSB in a press release announcing the conclusion of the investigation.

His increased workload likely prevented

the pilot from considering a go-around, and the aircraft continued under the unstable approach.

"During the final moments of the flight, a loss of control occurred when the pilot rapidly added full power, at low airspeed and low altitude, which caused an aircraft upset and resulted in the aircraft sharply rolling to the right and descending rapidly. Although the pilot managed to level the wings, the aircraft was too low to recover before striking the ground," wrote the TSB.

"The MU-2 is a high-performance aircraft [that is] challenging to fly, especially at low speed, and particularly during sudden applications of engine power," explained Fox.

The TSB has advised that pilots should always consider a go-around when a landing approach is unstable.

In this particular incident, Fox said the MU-2 pilot's situational awareness and judgment were impacted by the "very high" workload necessitated by reducing speed, altitude and rate of descent, completing the necessary checklist, and configuring the aircraft for landing.

Pilots are trained to follow stable-approach criteria defined by regulators, operators and aircraft manufacturers. Such procedures are designed to give them more time to monitor key elements of aircraft performance and to complete checklists before landing.

Fox also noted that a key source of information for TSB investigators was a lightweight recorder developed by the



This recording device provided valuable clues to help the TSB reconstruct the accident. **TSB Photo**

pilot and installed on board the aircraft. The device was not required by regulation. However, it provided investigators with important acceleration and GPS data as well as cockpit audio, allowing them to piece together a detailed history of the flight.

The TSB said these recorders can be useful to identify the causes of accidents, and to plan for safer flights in the future.

"Although the TSB does not endorse any single product, it would be fair to say that the lightweight recorder on this aircraft can be viewed as an indication of the way forward," said Fox. "The benefits of lightweight recorders are obvious. . . . We can point out deficiencies and risks and communicate them to industry, the regulator, and to all Canadians."

Fox said the TSB will continue to highlight the risks of continuing an unstable approach to a landing.

"We've seen too many of these [unstable approaches] in the past lead to tragic accidents," she concluded. "That's why unstable approaches are on our watch list." ❖

External bag, carabiner struck Hydro One tail rotor: TSB



• **Lisa Gordon**
Accident Investigation

Canada's Transportation Safety Board (TSB) has revealed more information about the Dec. 14, 2017, crash of a Hydro One AS350 B2 AStar near Tweed, Ont.

The accident claimed the lives of all four people on board, including pilot James Baragar, 39, and linemen Kyle Shorrock, 27; Jeff Howes, 26; and Darcy Jansen, 26.

The crew had been performing maintenance on high-power transmission lines and the helicopter was on approach for landing when it reportedly lost control and crashed into a nearby wooded area.

The TSB said in a news conference on Dec. 21 that bags used for carrying tools and supplies were being transported externally on an AirStair platform extending from the right side of the helicopter's fuselage.

Investigators noted these bags are normally attached to the AirStair with double-lock carabiners.

Shortly before the accident, the pilot picked up the three linemen at the base of a tower and was ferrying them to a nearby staging area. While nearing the staging area, one of the bags dislodged from the platform and, together with its attached carabiner, flew back and struck the tail rotor, which subsequently separated from the aircraft.

The helicopter departed controlled flight and all three passengers were ejected from the aircraft while it was still airborne. Investigators later found that two of the three passenger seatbelts in the aft seating area were unfastened.

Members of the TSB team also located a damaged white canvas bag (with a damaged carabiner attached) as well as the tip of a tail rotor blade more than 600 metres (1,968 feet) away from the crash site.

Investigators also recovered the aircraft's GPS unit, although it was not

A Hydro One crew demonstrates the use of an external AirStair platform. **Mike Reyno Photo**



equipped with—or required to carry—a cockpit voice recorder (CVR) or flight data recorder (FDR).

The helicopter wreckage was sent to the TSB Engineering Laboratory in Ottawa, where its systems—including flight controls and engines—will be examined.

The investigation will also review helicopter maintenance and pilot training records, as well as operational policies and procedures and regulatory requirements. ✂

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Whitehorse, Yukon-based aviation photographer **Simon Blakesley** captured the winter sun trying its best to warm up this RCAF CC-177 Globemaster from 429 (Bison) Squadron on a frigid -35C morning at Erik Nielsen Whitehorse International Airport (CYXY).



Dashing through the snow: A WestJet Encore Q400 accelerates on Runway 33L at Toronto Pearson, on a briskly cold but sunny December morning.

Runway 15-33 operations offer photographers a unique vantage point of arriving and departing aircraft.

John Chung Photo



A Basler DC-3T operated by Oshawa, Ont.-based Enterprise Airlines sits on the ice in Atka Bay, Antarctica, with a few of the locals.
Derek Weaver Photo



Bird of a new feather: Nav Canada's flight inspection fleet is getting a fresh new look. Here's a peek at the first aircraft to sport the new livery, a Bombardier CRJ-200. Photographer **Matt Dueck** of Dueck Images captured this photo at Calgary International Airport on Jan. 15, 2018.



Download the wallpaper [here!](#)



ON-TIME DEPARTURE:

The C Series in Service

BY KENNETH I. SWARTZ

The success of any commercial aircraft ultimately comes down to its ability to make money for an airline.

The more money a new aircraft makes (or saves) the greater its value, especially if it is easy to maintain and consistently delivers its fare-paying passengers to their destinations on time.

Developing a new clean sheet aircraft design powered by an entirely new turbofan family is an expensive and risky venture, which is why it doesn't occur very often.

"Having Swiss [International Air Lines] as a launch customer really forced Bombardier to step up its game," observed a senior Bombardier executive who asked not to be named. "They told us what they wanted and expected when the C Series entered revenue service."

RISE OF THE C SERIES

Many eyes have followed the Bombardier C Series aircraft program since the brand new design was launched at the Farnborough Air Show in 2008 and the first 100-to-135-seat CS100 (FTV1) flew on Sept. 16, 2013, powered by a pair of Pratt & Whitney PurePower PW1500G geared turbofan (GTF) engines.

While few passengers or aviation enthusiasts in Canada (outside the Greater Montreal Area) have flown in or seen a C Series jet, more than two million European passengers have flown on the aircraft from the first revenue passenger flight with Swiss in mid-July 2016 to the end of 2017.

In the first year of service, the C Series fleet served more than 100 routes, completed over 160,000 revenue flights (up to 100 revenue flights per day), and

flew up to 10 legs and 17 flight hours per day, per aircraft. Turnaround times were as short as 35 minutes.

By the end of 2017, Bombardier had delivered 24 C Series from its Mirabel Airport factory, including seven aircraft in 2016 (five CS100s and two CS300s) and 17 in 2017 (three CS100s and 14 CS300s).

On New Year's Day, Swiss was flying 15 C Series (eight CS100s and seven CS300s); airBaltic was operating seven CS300s; and Korean Air Lines was scheduled to launch domestic flights from Seoul on Jan. 16, 2018, with two CS300 aircraft delivered at the end of December.

Bombardier missed its original target of more than 30 deliveries in 2017 (initially because of Pratt & Whitney engine delays), but it is scheduled to deliver at least 40 new jets in 2018.



The launch customer for the CS100, Swiss International Air Lines, reports that "certain performance parameters, such as fuel consumption and range, have proven substantially better than agreed." **Swiss Photo**

Bombardier partnered with CAE to develop the world's first C Series full-flight simulator. It received Level D certification in June 2017. **Bombardier Photo**



DESIGNING A SERVICE-READY AIRCRAFT

Bombardier started preparing for the C Series aircraft's entry into service at the very beginning of the aircraft development program, said Todd Young, vice-president and general manager, Customer Services and Q400 Aircraft Program, Bombardier Commercial Aircraft.

"Our customer service organization has been working on the C Series program since the very beginning," he explained. "We embedded customer service representatives into the Integrated Product Development Teams (IPDT)... [to bring] in-service experience to the design of the aircraft, with a total focus around improving the overall maintainability of the aircraft, the reliability of the aircraft, and the overall management

of the aircraft in service."

During the C Series design process, "We had input on where the maintenance access points were on the aircraft, the location of equipment on the aircraft, and the actual design layout from a maintainability and cost point of view," added Young.

LAUNCH CUSTOMERS

When Bombardier launched the C Series program in July 2008, oil prices had reached a record US\$147 a barrel.

Pratt & Whitney's ultra-high-efficiency geared turbofan engine was a real differentiator for the C Series. The powerplant's state-of-the-art gear system allows the engine's fan to operate at a different speed than the low-pressure compressor and turbine, thereby delivering

double-digit reductions in fuel burn, CO₂ and NO_x emissions, engine noise and operating costs. This meant airlines would spend less on fuel and fly a "greener" aircraft.

In March 2009, Bombardier announced that Deutsche Lufthansa AG, the launch customer for the C Series, had signed a firm purchase agreement for 30 CS100 aircraft to be operated by its subsidiary, Swiss, with the aircraft originally expected to enter service in 2013.

The first Swiss CS100 aircraft would replace a fleet of four-engine BAE/Avro RJ100s that were expensive to operate and aging.

Then airBaltic, the national airline of Latvia, became the launch customer for the larger CS300 when it placed an order for 10 aircraft, in December 2012, with 10 options that were later converted into firm orders.

The CS300s were ordered to complement

C SERIES IN THE CITY

SERVICE TO LONDON CITY

Thirty years ago, de Havilland Canada's long-time vision of creating new city centre airports served by short takeoff and landing (STOL) aircraft was realized on Oct. 26, 1987, when Brymon Airways commenced scheduled Dash 7 service from the new London City Airport (LCY).



30 YEAR MILESTONE

Three decades later, Bombardier celebrated another important Canadian aviation milestone when the first C Series revenue flight into London City Airport, a Swiss CS100 jetliner, arrived from Zurich on Aug. 8, 2017.



SIZE MATTERS

"From/to London City, the C Series allows us to transport more passengers than with any other aircraft. The CS100 is currently the biggest aircraft flying into LCY. This way we can offer more seats on this important route with the same amount of flights," said Swiss.

MAX CAPACITY

Operating from the 3,934-foot (1,199-metre) runway, the CS100 has 275 per cent more range (to a distance of 2,200 nautical miles) and 25 per cent more seats than its closest competitor.



Watch the video [here!](#)



On Dec. 14, 2016, CS300 launch operator airBaltic completed its first commercial flight with the aircraft. After more than a year in operation, the airline reported it had increased the number of passengers served by 21 per cent. "The aircraft has performed beyond the company's expectations," airBaltic told *Skies*. **airBaltic Photo**

a mixed fleet of classic Boeing 737-300s and 737-500s and 12 Bombardier Q400 turboprops flying with the Riga-based airline.

At the 2015 Paris Air Show, Swiss announced it was converting 10 of its 30 firm-ordered CS100 aircraft to the larger CS300 aircraft.

With today's lower fuel prices, the operating cost advantages of the more fuel-efficient C Series aren't as great as they were when it launched in 2008, but the two European launch customers are still very pleased with the passenger experience and operating economics, according to written statements from both airlines to *Skies*.

Both provide good examples of airlines selecting the C Series to "right size" their routes and fleets to improve profit per passenger.

SPREADING RANGE

Bombardier specifically designed the C Series to serve challenging city centre airports that require a steep approach and have shorter runways. Swiss also flies the CS100 into a small airport in Florence, Italy.





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Service and support is a key element of C Series success. Bombardier built a new Customer Response Centre in Mirabel, Que., that is open around the clock. An illuminated wall shows the location of every aircraft. **Bombardier Photo**



“PRATT & WHITNEY’S TURBOFAN ENGINE WAS A REAL DIFFERENTIATOR FOR THE C SERIES.”

REDEFINING CUSTOMER SERVICE

As the C Series advanced through the development and flight test program, Todd Young said the Bombardier customer service team focused on three key initiatives.

“First, we started to look at our [customer service] systems and tools in use for our existing platforms,” said Young.

The primary focus was on developing new “e-tools” or electronic systems that would complement the sophisticated health management system (HMS) installed on every C Series aircraft.

(The HMS, now known as the FlightLink system, is connected to the aircraft avionics and collects data from all the various electronic sensors throughout the aircraft, relaying it to the ground, together with P&W PW1500 engine data.)

One of the most important new e-tools was the Bombardier Electronic Fault Isolation Manual (EFIM).

“This is an electronic system that the airline uses to troubleshoot the aircraft. It is also used to return the aircraft to service,” said Young. “In the past, we had a troubleshooting system that was separate from the fault isolation manual. Now we have integrated the troubleshooting tool with the fault isolation manual into a single electronic system.”

Next, Bombardier developed a new customer web portal at www.iflybombardier.com to better connect with its customers.

“This is the access point to a complete repository of all the technical publications, in-service engineering reports and supplier information that an airline needs to manage the aircraft,” said Young.

Another addition introduced a new customer relationship management

(CRM) tool, powered by Salesforce. The integrated system helps accelerate the support Bombardier provides its customers and also allows a customer to trace how Bombardier’s response to a question or inquiry is progressing.

Bombardier’s second major customer service initiative was to build “a brand new Customer Response Centre (CRC) at our Mirabel factory that is central and staffed 24 hours a day, seven days a week, 365 days a year,” said Young.

When *Skies* toured the state-of-the-art facility in September, the strongest feature was a large illuminated wall containing key C Series fleet metrics, including a map showing the location of every new generation jet throughout its flying day.

“The team includes engineering specialists covering all the systems and structure on the aircraft, surrounded by individuals in support groups that include technical publications, spare parts, flight operations and suppliers,” said Young.

START-UP TEAMS

Bombardier’s third important customer service initiative saw the OEM place a much larger team of technical experts on the ground to support the new jet’s entry into service.



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“[When] we looked back to see how we managed the entry into service of our previous aircraft, it became apparent that we needed to step up our support for the launch of C Series service,” said Young.

“Then we actually did a pilot project of our new approach using the delivery of new Q400 turboprops to WestJet to test our new concept. We learned a lot from this exercise and how to further improve the process.

“The start-up teams deployed to Swiss and airBaltic, and they are now on the ground in Korea, including liaison pilots, in-service engineers, field service representatives, maintenance engineers, technical publications and spares specialists as well as field service reps from all of the C Series aircraft’s key suppliers,” said Young.

Every C Series start-up team includes an on-site manager responsible for overseeing the entire entry-into-service group, a lesson learned from the WestJet trial.

The primary role of the team is to ensure “knowledge transfer” regarding the aircraft

to the airline’s key personnel, as well as to assist with any kind of disruption in the early days of passenger service.

Swiss and airBaltic also contracted for additional Bombardier technical support when they joined the C Series Smart Parts program, which provides the airlines with comprehensive component maintenance, repair and overhaul (MRO) services, access to a strategically located spare parts exchange pool, and an on-site inventory at their respective operating hubs.

Bombardier has also been working closely with Pratt & Whitney to resolve issues with its geared turbofan engines to make them more durable.

SWISS IMPRESSIONS

Swiss inaugurated Bombardier CS100 revenue service on July 15, 2016, between Zurich and Paris Charles de Gaulle Airport, with the aircraft in a 125-seat configuration.

“Compared with other totally new aircraft types, the entry into service of the C Series went very smooth,” wrote a Swiss

representative in an emailed response to questions from *Skies*.

“We only had minor issues; for example, with the air conditioning or deicing or with the cabin management system. In close collaboration with Bombardier, we were able to address most of these issues by now. All in all, we are satisfied with the performance of the C Series.”

On May 26, 2017, Swiss took delivery of its first 145-seat CS300 aircraft featuring 30 seats in business class and 115 seats in the main cabin.

“With its size and its lower unit costs, the CS300 is the ideal complement to the CS100 and the rest of our European fleet,” continued the Swiss spokesperson. “So with these two new aircraft types, we can align our capacity very closely to demand, providing more flexibility on all our European routes.”

The majority of the Swiss CS100 order was used to replace the aging Avro RJ100s, with the CS300 aircraft partly used to replace Airbus A319s and A320s out of Geneva, as well as to enable moderate future growth.

Swiss replaced its aging and costly fleet of Avro RJ100s with the CS100. The new aircraft enabled the airline to reduce its operating costs by 25 per cent, per seat. **Swiss Photo**



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Pratt & Whitney's geared turbofan engine allows airlines to spend less on fuel and fly a "greener" aircraft. **airBaltic Photo**



The CS300 offers passengers wider seats, larger windows, more hand luggage space, and improved lavatories. **airBaltic Photo**

“AIRBALTIC REPORTS THE CS300 HAS A 30 PER CENT LONGER RANGE THAN THE CLASSIC BOEING 737s IT CURRENTLY FLIES. THIS HAS ALLOWED THE AIRLINE TO IDENTIFY SEVERAL NEW ROUTES.”

The introduction of the CS100 helped Swiss reduce its operating costs by 25 per cent, per seat, in comparison with the Avro RJ100, through lower maintenance costs and more fuel efficient engines.

“We are pleased to report that certain performance parameters, such as fuel consumption and range, have proven substantially better than agreed. The fuel consumption is 20 to 25 per cent lower compared with the Avro RJ100. It is also 10 to 15 decibels quieter than comparable aircraft types, which is very important for densely populated areas,” reported Swiss.

The airline told *Skies* it did not adapt its network or introduce new routes when the C Series entered service.

“The CS300 aircraft offers 20 additional seats at only slightly higher production costs. This is an important factor concerning our profitability, especially also from our base in Geneva.”

The airline also said its pilots praise the C Series and are particularly impressed with its intuitive flight crew interface.

The first pilots, cabin crew and technicians were trained at Bombardier training facilities, but now all Swiss pilots are trained at Lufthansa Aviation Training in Switzerland.

AIRBALTIC EXPERIENCE

On Dec. 14, 2016, CS300 launch operator airBaltic completed its first commercial flight between Riga and Amsterdam with 120 passengers on board.

“The aircraft has performed beyond the company’s expectations, delivering better overall performance, fuel efficiency and convenience for both staff and the passengers,” airBaltic told *Skies*.

“[The] CS300 is a state-of-the-art aircraft that offers an excellent flying experience, with benefits for passengers such as wider seats, larger windows, more hand luggage space, and improved lavatories, among others.

“With the introduction of brand new Bombardier CS300 aircraft, this year airBaltic has increased the number of passengers served by 21 per cent. Thanks to the improved efficiency of the aircraft, this summer was the strongest in the history of airBaltic. For several months in a row, airBaltic, which turned 22 this autumn, reached record high passenger flow as well as revenue,” concluded the airline.

As of early December 2017, airBaltic—which boasts a 90.01 per cent on-time performance, making it the world’s most punctual airline according to travel analyst OAG—had carried more than 630,000 passengers on the Bombardier CS300 aircraft. In total, the airline said the new aircraft have performed in excess of 6,023 commercial flights and flown more than 16,000 block hours, with every fourth passenger now flying on the CS300.

The first CS300 deliveries to airBaltic supported a growth strategy.

In 2017, airBaltic launched 13 new destinations from its main hub in Riga and will add at least seven more in 2018.

The airline said the C Series has 30 per cent longer range than the classic Boeing 737s (737-300 and 737-500) it currently flies. This has allowed it to identify at least 11 long distance routes into Europe, North Africa, the Middle East and the former Soviet Union for future service.

Notably, in late October, airBaltic launched non-stop passenger service between Riga and Abu Dhabi with the CS300, reporting strong traffic on the six-hour, 2,359-nautical mile (4,369-kilometre) route.

The airline's fleet modernization plan calls for an additional 11 CS300 aircraft. AirBaltic would also like to replace its 12 Q400 turboprops with CS100s in order to operate an all-C Series fleet by 2020. However, as of early 2018, it had not yet ordered any CS100s.

The commonality benefits of an all-C Series fleet include a uniform passenger experience, pilot interchangeability, and one set of spares and equipment for reduced capital expenditures and overhead.

In terms of fuel efficiency, airBaltic reported that the CS300s burns an average of 20 per cent less fuel than the 737-300 it has replaced. For example, between Riga and London, the aircraft burns 22 per cent less fuel. (Fuel currently accounts for 20 per cent of the airline's operating expenses.)

Upgrading from the 77-seat Q400 to the 145-seat CS300 on the Riga-Brussels route, for example, would cut flight times by 31 minutes, almost double the sellable seats, and reduce the operating cost per seat by 57 per cent, allowing airBaltic to offer lower fares.

As for the passenger perspective, the airline said they "love the enhanced comfort of the C Series," noting that the aircraft offers the quietest cabin in its class, the largest overhead luggage space in its class, the greatest seat width and the widest middle seat of any single-aisle aircraft. As well, the windows are 26 per cent bigger than the 737 and provide more natural light.

The first airBaltic crews trained in Canada. Today, technician training is done in Riga and the pilots train on a CAE simulator in Frankfurt.

PROVING ITS WORTH

Developing a new clean sheet commercial aircraft is not for the faint of heart.

It is often regarded as an aggressive "bet the company" product strategy that aims to be first-to-market with a new generation aircraft offering significant operating cost savings together with enhanced performance capabilities.

Bombardier first looked at a new 90- to 130-seat aircraft in the late 1990s but backed away, providing an opportunity for Embraer to enter the market.

The development of the Pratt & Whitney PW1500 geared turbofan engine provided the Canadian OEM with a new opportunity to enter the 100- to 150-seat market with a new aircraft offering significantly lower operating costs, fuel burn emissions and noise.

The C Series design targets were met or exceeded, and all that remains now is for the jet to continue proving its worth and reliability in the field. ❏



◉ KENNETH I. SWARTZ

Kenneth I. Swartz has spent most of his career working in international marketing and PR with commercial aircraft manufacturers, airlines and helicopter charter operators. An award-winning aviation and rotorcraft journalist, he runs Aeromedia Communications.

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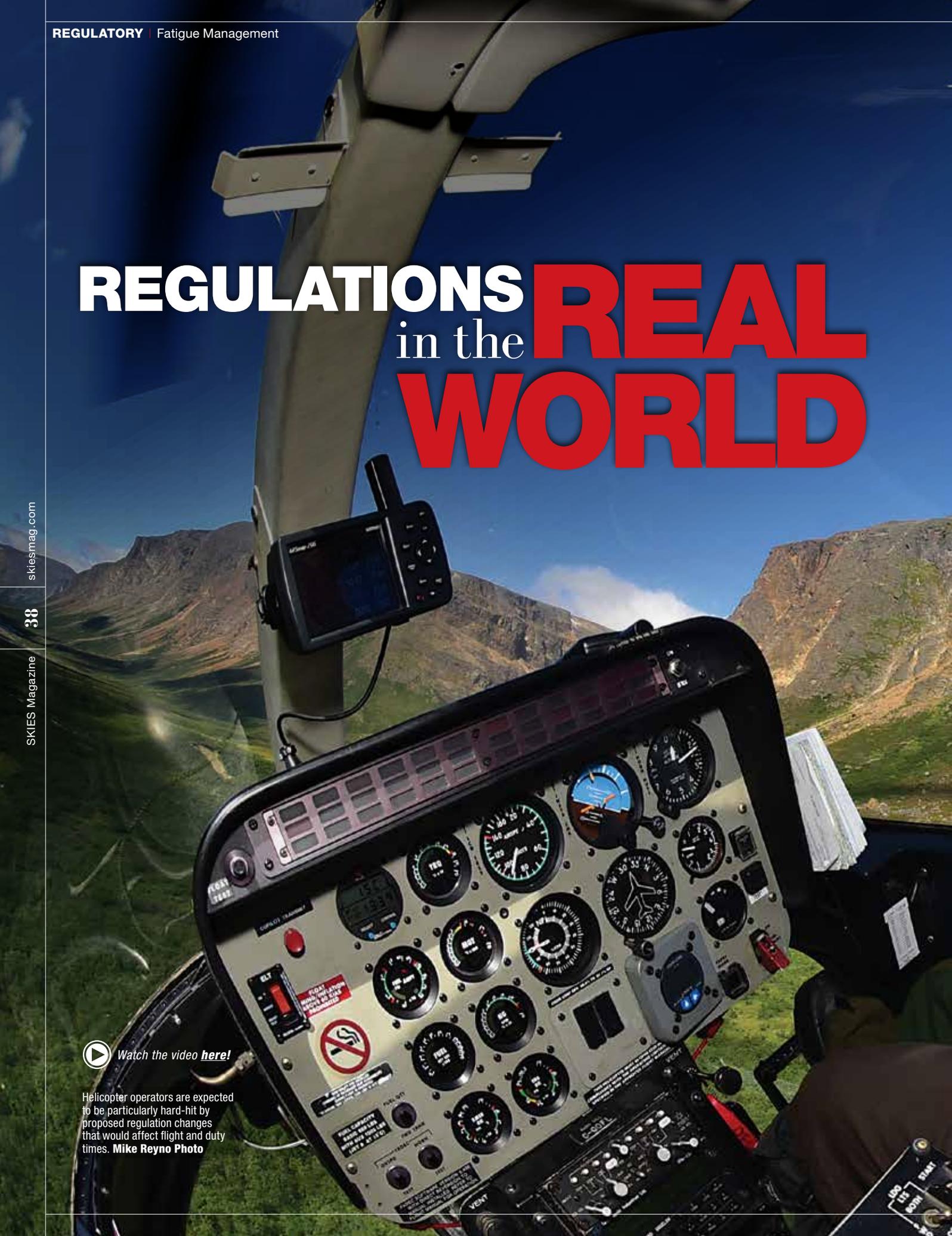
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Helicopter operators are expected to be particularly hard-hit by proposed regulation changes that would affect flight and duty times. **Mike Reyno Photo**





Many operators are concerned about the practical and financial implications of proposed changes to Transport Canada's fatigue management regulations.

BY BEN FORREST

“WE HAVE ARGUED FOR SOME TIME NOW THAT THESE PROPOSED REGULATIONS, AT LEAST AS FAR AS OUR SEGMENT OF THE INDUSTRY IS CONCERNED, DO NOT FIT.”

FRED JONES, PRESIDENT AND CEO, HELICOPTER ASSOCIATION OF CANADA (HAC)



ABOVE: Smaller operators who fly to remote locations are concerned about both the practical feasibility and the financial cost of complying with the regulation changes. **Stephen M. Fochuk Photo**

RIGHT: The CBAA has made two submissions to Transport Canada regarding new flight and duty regulations on behalf of 704 members, and a second as part of the larger aviation coalition. **Eric Dumigan Photo**

OPPOSITE: The regulation changes might work for major airlines like Air Canada, which fly to large airports. But other operators balk at the one-size-fits-all solution. **John Chung Photo**



Not long after 10 p.m. local time on Feb. 12, 2009, a Colgan Air Inc., Bombardier DHC-8-400 aircraft, operating as Continental Connection flight 3407, crashed into a house in Clarence Center, N.Y., killing all 49 people on board and one person on the ground.

Impact forces and a post-crash fire destroyed the aircraft, which had been on instrument approach to Buffalo-Niagara International Airport, about five nautical miles from the crash site, according to an accident report from the U.S. National Transportation Safety Board (NTSB).

The NTSB concluded the pilots' performance was "likely impaired because of





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fatigue,” although the agency also said the extent of their impairment and the degree to which it contributed to performance deficiencies during the flight “cannot be conclusively determined.”

Still, the incident highlighted flight crew fatigue as an international safety issue, and it was in this context that the International Civil Aviation Organization (ICAO) created a series of new standards for fatigue management requirements.

One of the ICAO standards is for state members to establish regulatory requirements for flight time, flight duty time, duty periods and rest period limitations, based on scientific principles and knowledge, to enable flight crew members to perform at an

adequate level of alertness.

Canada is in the process of trying to meet the new standards with proposed amendments to the Canadian Aviation Regulations (CARs), following regulatory changes from the U.S. Federal Aviation Administration and European Aviation Safety Agency that came into effect in 2014 and 2016, respectively.

But while there is general support in Canada’s aviation community for improved safety, some see the proposed changes as a one-size-fits-all solution that doesn’t reflect the concerns of smaller operators, particularly in the helicopter industry and in Northern Canada.

Some have gone as far as to say the changes would be devastating to parts of the industry,

and that more time is needed to consult with stakeholders and fine-tune the regulations.

“We have argued for some time now that these proposed regulations, at least as far as our segment of the industry is concerned, do not fit,” said Fred Jones, president and CEO of the Helicopter Association of Canada (HAC).

“It’s going to increase the costs of our services significantly, to a point where it may threaten the existence of some of our smaller operators.”

A BRIEF OVERVIEW

The new prescriptive requirements would apply to CARs subpart 703 (air taxi), 704 (commuter) and 705 (airline) operators, and would reduce a pilot’s maximum flight time

from 1,200 hours to 1,000 hours in any consecutive 365 days.

The maximum flight duty period would be reduced from 14 consecutive hours in a 24-hour period to between nine and 13 hours, depending on when duty begins and the number and duration of flights.

Duty periods would be smaller if they begin between 11 p.m. and 3:59 a.m., in light of research that demonstrates the effects of fatigue during a body's "window of circadian low."

Maximum duty times would be capped at 2,400 working hours in any 365 consecutive days, with additional weekly and monthly limits depending on several factors, including time free from duty and the timing of flights within the duty period.

Rest periods would increase from eight hours (plus time for travel, meals and personal hygiene), to between 10 and 12 hours, with fluctuations within that range that consider whether the pilot is at home base, and if the air operator provides suitable accommodation.

Additional rest opportunities would be provided for flight crew transitioning from flight duty period start times that are "very fatiguing." This includes scenarios such as

disruptive schedules, time zone differences and consecutive night duties.

Operators would be able to deviate from the prescriptive requirements (with the exception of maximum annual flight time and maximum annual duty time) if they can demonstrate, by way of a safety case, that they can provide at least the same level of safety as the prescriptive requirements.

This could take the form of a fatigue risk management system (FRMS), which operators would use to identify and minimize the acute and chronic sources of fatigue and manage its potential associated risks. [See FRMS sidebar.]

Under the proposed regulations, the pilot-in-command would also be able to reduce or extend the flight duty period slightly when they encounter unforeseen operational circumstances.

Transport Canada estimates the potential reduction in accidents would save passengers, flight crew, and operators about \$314.3 million over the next 15 years, while costing the industry about \$337.65 million over the same period, mainly due to changes to flight crew scheduling requirements. Overall, the estimated net cost will be \$23.35 million over 15 years.

INCREASED COSTS

While increased operating costs are by no means the only concern among smaller operators, they are a major factor driving opposition from HAC and the Air Transport Association of Canada (ATAC).

HAC estimates the new regulations would require between 30 per cent and 50 per cent more pilots to provide the same level of service, creating a sizeable financial burden and a number of logistical challenges, given most helicopter operators fly in remote locations.

"It's not like we're an airline that can simply draw from a pool of pilots as they pass through Calgary or Toronto," said Jones.

"Sometimes it takes pilots in our industry two or three days flying just to get to the job site ... at the end of the day for us, it's going to mean manning up a single-engine helicopter in remote operations with two pilots rather than one, or it's going to mean rotating pilots in about every two weeks."

ATAC estimates the fixed-wing industry would require an average of 25 per cent more pilots under the new regulations, adding stress to operators already struggling due to the pilot shortage.

"Pilots don't seem to realize they'll work fewer hours, but more days," said John McKenna,

Corey Taylor of Universal Helicopters estimates it would cost the commercial helicopter company at least \$100,000 a year to comply with the new regulations. **Mike Reyno Photo**



president of ATAC, at the organization's annual conference in Montreal this past November.

"And it will threaten the livelihood of some companies. If suddenly your labour costs increase by [an average of] 25 per cent, some of the operators won't be able to operate.

"Some routes that are not profitable will be dropped. If they have to double crew them, or have the crew stay overnight, some of these routes may be jeopardized. The cost of any airline ticket in Canada will go up. Finally, it's going to put more pressure on the pilot shortage."

Transport Minister Marc Garneau has emphasized the importance of improving safety through regulatory changes supported by science.

"We cannot take chances when it comes to flight crew members whose judgment and performance could be impaired," said Garneau in a press release. "By aligning our regulations with the latest scientific findings and international standards, Canadian travellers can be confident that flight crews on board their planes are fit for duty."

PILOTS NEEDED

In a perfect world, if there were enough pilots to go around, Corey Taylor estimates it would cost Universal Helicopters at least \$100,000 a year to comply with the new regulations.

The Goose Bay, N.L.-based company has a fleet of 19 Bell and Airbus helicopters, servicing mineral exploration, environmental sciences and search and rescue clients, often in remote Northern locations, with Taylor as vice-president of business development.

"It's a paradigm shift, because the clients themselves would have to suddenly change the way they do everything," said Taylor.

And of course, this isn't a perfect world.

"The pilot shortage already is the biggest risk we face [from a safety perspective]," he said.

"Without enough pilots, inevitably we end up with pilots we wouldn't normally hire in the cockpits. I mean that as an industry, not just our company."

Taylor added that under the new regulations there would be an "order of magnitude increase in helicopter crew seats, with no one to occupy them."

He estimated the cost of "base work," where a pilot is within two days' travel of a Universal Helicopters hangar, would increase 20 to 30 per cent a year and would increase a three- or four-pilot roster to five or six pilots for certain jobs.

But matters are complicated significantly when it comes to "deployed work," when pilots are away from the hangar for days at a time, living in camps devoted to mineral exploration or oil and gas contracts.

Most of the company's work during the busy summer season is deployed, and while Taylor could not estimate exactly how much more it would cost, he noted concerns about

the effect of bringing in extra crews.

"When it takes you three days to get to an Arctic camp ... you are literally going to spend 40 per cent of your time travelling to and from work," he said. "This is not something that's going to be attractive to pilots."

This may be the kind of special case an FRMS could address, and Taylor speculated Transport Canada may also permit operators to bend the rules during a busy fire-fighting season. But his frustration with the situation is clear.

"Why is there a rule to start with that is supposed to be about safety—yet when the demand is there they're going to give the industry a letter telling us they've looked at the situation and, since safety isn't compromised, we'll be allowed to work outside the new rules?"

PRACTICAL CONCERNS

Taylor used the example of his company's contract for the federal Polar Continental Shelf Program, where pilots carry researchers 3,200 kilometres (2,000 miles) into the High Arctic for three to four weeks at a time.

The job typically involves a single pilot and no mechanic, working with clients who dart polar bears and carry out biological, environmental and archaeological surveys, said Taylor.

"That pilot provides a 14-hour duty day and five or six hours flying a day, and then we fly them out," he said. "It takes three days to get a shift change happening, and we send them home. Another pilot replaces them for three to four weeks, and they carry on.

“THE AIR TRANSPORT ASSOCIATION OF CANADA ESTIMATES THE FIXED-WING INDUSTRY WOULD REQUIRE AN AVERAGE OF 25 PER CENT MORE PILOTS UNDER THE NEW REGULATIONS.”



The pilot shortage is one of the most significant issues facing both fixed-wing and rotorcraft operators in Canada. The proposed regulations are expected to make the situation significantly worse. **Jan Jasinski Photo**

“How, under the new proposed regulations, would we actually manage that? Because by definition we suddenly have to have a shorter duty day, which of course inconveniences the client.”

Such contracts could be possible with additional government funding that supports having 10 pilots in the Arctic instead of five, he said.

“But most clients are simply going to say it’s not achievable. And where would the pilots come from, anyway?”

ONE SIZE DOESN'T ALWAYS FIT

Canada’s smaller fixed-wing operators are also grappling with the implications of the proposed regulations, which in some cases would dramatically change how they approach their businesses.

A solution that might work for major airlines is seen as one that doesn’t fit for charter and medevac operations that fly without a set schedule.

“There are definitely some rule changes that need to happen at times,” said an executive at an operator that frequently flies in Northern Canada. “However, the costs to the public may far outweigh any safety benefits that are intended by these changes. For example, in our medevac operation, these changes may require having twice as many crews, which adds substantial costs, and ignores other safeguards that are already in place.”

The executive said the company had not completed cost projections for complying with the proposed regulations, but said it could “easily” be into the hundreds of thousands of dollars a year.

A CUSTOMIZED PLAN

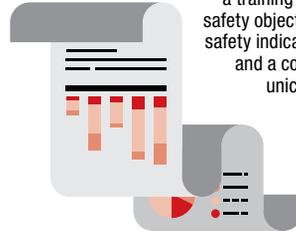
WHAT'S IN AN FRMS?

A Fatigue Risk Management System (FRMS) would allow air operators to tailor their fatigue management policies, procedures, and practices to specific conditions and unique operational demands that induce fatigue.

A typical FRMS would have four components:

A FATIGUE RISK MANAGEMENT PLAN

that includes a fatigue reporting policy, a training plan, safety objectives, safety indicators, and a communication plan;



A FATIGUE RISK MANAGEMENT PROCESS

that would describe a fatigue reporting procedure, identify fatigue-related hazards, data collection and analysis, a method to analyze planned work schedules, and a risk assessment and management process;



“A medevac crew using company aircraft typically works a 14-hour shift and goes on rest for nine to 10 hours,” the executive said. “After the rest period, they are available again for another 14 hours.”

Under the current system, if one pilot works a day shift and doesn’t get a call during the day, they may be also available for the night shift.

“These changes would make that no longer possible,” said the executive.

“While these proposed regulation changes may not push us as a company out of business, there would likely be loss of employment and certainly higher costs to the end user and/or taxpayer.

“Until we see the final ruling it is difficult to determine the entire impact on [the] business aviation sector and other small aviation operators; however, it genuinely seems to be the wrong solution in this type of operation.”

The executive called on government to

take a step back and consult more with smaller companies and business aviation operators before the regulation changes are finalized.

“There’s definitely time to look at this and see where we’re at,” the executive said. “Let’s see what the research actually says for these operations which are quite different than the scheduled airlines, for whom these changes were intended. The one-size-fits-all approach doesn’t work. There’s just too much variety in Canada for that all to work.”

A MEASURED APPROACH

Despite concern about how the regulation changes would affect smaller operators, there is genuine support for their intent to create a safer industry for pilots and passengers alike.

“We see anything that’s working towards a safer industry as a good thing,” said Alasdair Martin, president of Air Tindi, another



FATIGUE RISK MANAGEMENT PROMOTION

which would include a training program for FRMS components and would describe employee responsibilities; the impact of fatigue on aviation safety; how to recognize fatigue, sleep disorders, human and organizational factors that may cause fatigue; actions to be taken for fatigue-related risks; personal fatigue management strategies; and a communication procedure to inform employees of the FRMS and fatigue-related issues;



FATIGUE RISK MANAGEMENT SYSTEM ASSURANCE

which would include an FRMS audit process, procedures to assess and improve FRMS effectiveness, and procedures to develop, implement, and monitor corrective and preventative measures.



Air operators would be required to use fatigue data or scientific evidence to demonstrate their proposed deviation from the prescribed requirements is safe, and demonstrate they have managed all risks.

Deviations may be allowed if the operator demonstrates that applying their FRMS does not increase the level of fatigue, nor decrease the level of alertness of flight crew members, and if the operator can demonstrate this through a data-supported safety case.

This could include flight crew member performance data; aircraft flight data monitoring to assess operational errors; accident or incident information; a work schedules report; comparisons of planned schedules in relation to time worked; and a review of operational or administrative duties.

small charter, cargo, tourism and medevac operator based in Northern Canada.

“So there’s certainly no opposition to the concept ... I think there’s some fine-tuning required to try and recognize some of the differences.”

Operators in the far North have relatively few airports to work with and less reliable weather reporting.

They also deal with 24-hour daylight for parts of the year, when the difference between flying at 6:59 a.m. and 7 a.m. is virtually nonexistent—but starting before 7 a.m. would reduce the maximum daily duty period from 13 hours to 12 hours.

Also, Northern charter operators typically fly to multiple remote communities on a single “milk run,” and would be affected by regulations that lessen the permissible duty time based on the num-

ber of flights in a given day.

Shorter duty times would mean some trips that currently take a single day would take two days, adding cost to the operator that would

need to be passed on to the customer.

“The question is, if the customer, as a result of having to have a significant increase in the cost of doing a job,

A solution that might work for major airlines doesn’t necessarily fit charter and medevac operations, such as Air Tindi, that fly without a set schedule. **Jason Pineau Photo**



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Northern operators who typically fly to several remote communities on a single “milk run” would be affected by regulations that shorten the permissible duty time based on the number of flights in a given day. **Jan Jasinski Photo**



“DESPITE CONCERN ABOUT HOW THE NEW REGULATIONS MIGHT AFFECT SMALLER OPERATORS, THERE IS GENUINE SUPPORT FOR THEIR INTENT TO CREATE A SAFER INDUSTRY FOR PILOTS AND PASSENGERS ALIKE.”

job?” said Martin. “Does it preclude things happening in the North?”

These aren’t trivial questions, given air travel is the only way in or out of some Northern communities.

“It’s absolutely essential for so much of what goes on in the North,” added Martin. “Things that people would take for granted

elsewhere in Canada—a Twin Otter is a small bus anywhere else.”

Martin declined to estimate how much it would cost his company to comply with the proposed regulations, and reiterated his support for their intent.

“We support the intent at any point, which is making the industry safer, is recognizing

the need to have proper processes to ensure crews are fit for duty,” he said.

“But we also want to make sure there’s an understanding that some of the changes may have a significant effect on operations in the North—[an] unintended effect on the practical operations in the North.”

Transport Canada published the draft regulations in *Canada Gazette*, Part I, on July 1, 2017, and said it is reviewing all comments received as part of a consultation process. The final regulations are scheduled to appear in *Canada Gazette*, Part II, later this year.

Airline operators will have one year to comply with the regulations and commuter and air taxi operators will have four years to comply. 



BEN FORREST

Ben Forrest is assistant editor of *Skies* magazine. Before joining *Skies* in 2015, he spent the better part of 10 years in the newspaper industry, where he worked as an editor, sports editor and general assignment reporter.



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DANCING WITH Jack Frost

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SKIES Magazine

The Central Deicing Facility at Toronto Pearson International Airport can handle aircraft of all sizes, including this massive early morning visitor, an Antonov An-124-100. It took 20 minutes to deice the heavy lifter after it had overnighted at Pearson during a storm. **Patrick Cardinal Photo**

With an emphasis on efficiency and the environment, the Central Deicing Facility at Toronto's Pearson airport is recognized as a leader in aircraft deicing procedures.

► **BY LISA GORDON**
► **PHOTOS BY MIKE REYNO**



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Snowballs (deicing trucks) approach an aircraft in carefully prescribed patterns that vary depending on what type of plane is being deiced.

When Jack Frost comes to town, the Snowball dance starts at Toronto Pearson International Airport.

It's a highly choreographed performance, with the Snowballs starring alongside the Iceman, Frosties, and Polar Bears—and even Whiskey plays a supporting role.

All of these unusual call signs represent assets belonging to the Central Deicing Facility (CDF) at Canada's busiest airport.

The cutting edge centre opened in 1998 on a 65-acre parcel of land at the south end of Pearson. At the time, it was lauded as the largest and most advanced centralized deicing facility in the world. Many airports were still deicing aircraft right at the departure gates, a practice that is widespread even today.

But Pearson recognized the advantages of a centralized facility that would be more efficient at processing aircraft, while enabling stricter environmental controls that would drastically reduce the amount of glycol making its way into nearby Etobicoke Creek.

Today, the CDF may be 20 years old, but it still sets the standard.

"I would say we're probably the industry leader here," said Ken Eastman, director of deicing operations at the facility. "That's due to some of the technology we've implemented, such as our bay management system, telemetry in the trucks, [and] our automated deicing communications system that lets us communicate from the electronic flight strip to the trucks."

At peak capacity under frost conditions, the CDF's projections show it could handle 60 aircraft in an hour. While Eastman said they haven't yet experienced that level of demand, he added that a typical narrow-body deicing under those weather conditions should take less than 90 seconds.

The CDF's six deicing bays can accommodate 12 narrow-bodies, six wide-bodies

or any combination thereof—and the same number of aircraft can be staged behind them, ready to go.

"Last year, in December [2016], we put 51 aircraft through here in an hour under light snow conditions."

Eastman, who has worked at the CDF since it opened, explained that two types of glycol-based fluids are dispensed at Pearson. In frost conditions, an orange liquid heated to at least 65C and known as Type 1 deicing fluid, is sprayed over an aircraft's critical flight surfaces, most importantly its wings and tail.

In active precipitation conditions—moderate snow, for example—the CDF carries out a second application of green anti-icing fluid. This Type 4 mix is a more viscous fluid that soaks up precipitation and is effective for a prescribed time, allowing an aircraft to taxi and take off safely. As soon as an aircraft picks up speed and rotates off the runway the fluid shears off, leaving a clean surface, explained Eastman.

Deicing season can stretch from September to May, and while every year is different, on average the CDF goes through about 7.5 million litres of Type 1 fluid and two million litres of Type 4 fluid per season.

"The one question we always get asked is, 'Do you have enough fluid?' This facility actually ran out of fluid during an ice storm in April 2003 or 2004. That's when we started blending and making our own fluid here to have twice the supply," said Eastman.

Now, glycol is delivered on consignment in concentrate form. Depending on the weather forecast, the CDF has the ability to increase or decrease the concentration of glycol in the fluid. On the bitterly cold day that *Skies* visited, the CDF was applying a 44 per cent Type 1 blend.

Eastman noted that the ability to blend various concentrations helps mitigate deicing costs for operators. A 44 per cent blend costs



The Ice House is the nerve centre of the Central Deicing Facility. In the early pre-dawn hours of a cold winter's day, crews are busy directing pilots and the deicing team on the ramp.

about 80 cents a litre. It will take approximately 300 litres to treat a Boeing 747 in frost conditions, while a narrow-body will require about 100 litres.

So what happens to all of that used glycol? With each of the six deicing pads sloped from north to south, spent deicing fluid trickles into special catch basins and then into diversion vaults where it is tested onsite by wastewater technicians. After testing, the fluid is diverted to one of the CDF's massive underground storage tanks, with a combined capacity of 15 million litres.

"Because of our location, we can release fluids to the City of Toronto or the Region of Peel," explained Eastman. "Anything that is three per cent or higher in glycol is captured and kept. Anything lower is released to the sanitary systems based on our BOD [biochemical oxygen demand] limits as allowed."



Deicing specialists can drive their trucks from the elevated cab, allowing for efficient one-person operations.



A typical narrow-body deicing under frost conditions takes less than 90 seconds.



“ON AVERAGE, THE CDF GOES THROUGH ABOUT 7.5 MILLION LITRES OF TYPE 1 FLUID AND TWO MILLION LITRES OF TYPE 4 FLUID PER SEASON.”

Stored fluid is sent to a glycol processing facility, where it is brought back to a 50 per cent glycol concentration and then sold in the after-market, in products such as automobile windshield washer fluid.

To further safeguard the environment, the CDF’s entire ramp was built on top of a bonded membrane that prevents used glycol from seeping into the ground.

EQUIPMENT AND TECHNOLOGY

The CDF is a progressive facility that has kept up with the times.

For example, of the facility’s 46 total deicing trucks (also known as “Snowballs”), about half of them have the technology to blend glycol mixtures on board.

“As we continue to re-life the equipment, we will get to the point where we can blend the fluid of the day on all trucks,” said Eastman. “What we do now is we make batches of fluids, based on the weather forecast, and it goes out in the pipeline and the trucks fill up.”

Another fact that makes the Toronto facility unique in North America is that it is the only one with underwing deicing trucks (call sign “Whiskey”).

“What that does is it gives us the ability to spray the underwing or undercarriage of the aircraft and not have to shut the aircraft down, or put someone on the ground around the aircraft.”

Also hard at work out on the ramp are support trucks called “Frosties” and technical inspectors (codename “Quebec”) who are responsible for supervising spray patterns and performing quality checks. Glycol recovery vehicles (“GRVs”) also roam the ramp, vacuuming up excess glycol and collecting the fluid for processing.

The ground floor of the Ice House is home to the “Polar Bears”—also known as supervisors. Upstairs in the control room, a half dozen deicing movement coordinators (including a zone deicing coordinator (“Zulu”), Iceman North and South, pad controller and a bay manager) stare intently at a series of screens, occasionally glancing up through the wraparound picture window to watch an aircraft taxi into position for deicing.

Sometimes, they will use closed-circuit TV cameras to zoom in on an aircraft’s wings or tail to inspect for contamination. Other monitors keep them informed of the current fluid levels in each truck.

When aircraft arrive for deicing, pad control will take over from air traffic control (ATC) and direct them to the South Iceman (pads 1, 2, 3) or North Iceman (pads 4, 5, 6).

The zone deicing coordinator oversees the resources being applied and then the electronic flight strip goes back to the

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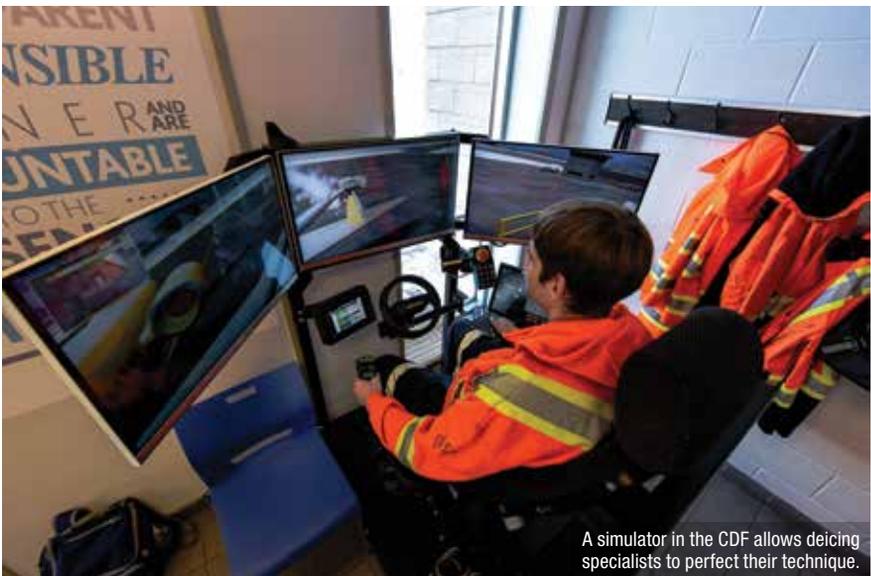
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It takes six weeks to train a deicing specialist to apply both Type 1 and Type 4 glycol solutions.



A simulator in the CDF allows deicing specialists to perfect their technique.



Technical inspectors supervise the deicing process and will physically inspect an aircraft at a pilot's request.

Iceman—who speaks with the flight crew directly during the deicing process. The Iceman then passes the flight strip back to pad control, who will exit the aircraft and transfer it back to ATC.

Once activated, flight strip information is forwarded to computers in the Snowballs. Deicing specialists confirm information and check off the work as it is performed.

In total, Toronto Pearson's Central Deicing Facility is home to 180 employees. Seventy-eight are seasonal workers, while the remainder comprise the year-round staff.

"We have a core group, and we use them to maintain this facility," explained Eastman. "Underground, those tanks all need to be cleaned. The entire core group is confined-space trained, so they take care of looking after the fresh glycol farm and the underground tanks. The team will go down in the summer and clean them all out."

The CDF is staffed around the clock for 365 days a year, although a skeleton crew holds down the fort in the summer. Sometimes, they are needed to direct traffic on the pad surface during lightning advisories or other extreme weather events.

The summer of 2018 will see lots of activity on the CDF grounds.

"Right now, we have a project in to put another five-million-litre storage tank underground," said Eastman. "They can only work in that area over the summertime. Construction will run from April to November; then they will close it up and do the mechanical work underground. When it's done, our capacity will be 20 million litres underground."

The new underground tank resulted from a CDF optimization study carried out in the summer of 2017. Eastman said they also examined the projected demand for deicing services over the next five years, realizing that the peaks and valleys are filling in.

"What do we need to do for air carriers to meet schedule resiliency? Yes, we can meet the demand under certain conditions, but when we're in a Type 1 and Type 4 procedure, we may not be able to keep up with demand," he pointed out. "We looked at widening a pad and maybe adding two additional pads, so that no matter what conditions we're in, we could keep up with demand."

"We're looking to see how we can optimize this existing real estate, increasing our resources, as well as looking at the benefits of expanding our capacity here."

While the location of those potential new pads is still to be determined, there is no doubt that the Pearson facility is moving to meet future airport growth.

According to the Greater Toronto Airports Authority, Toronto Pearson International logged 384,481 aircraft movements in 2016; and although final 2017 data had yet to be published at the time of writing, all indications were trending upward.

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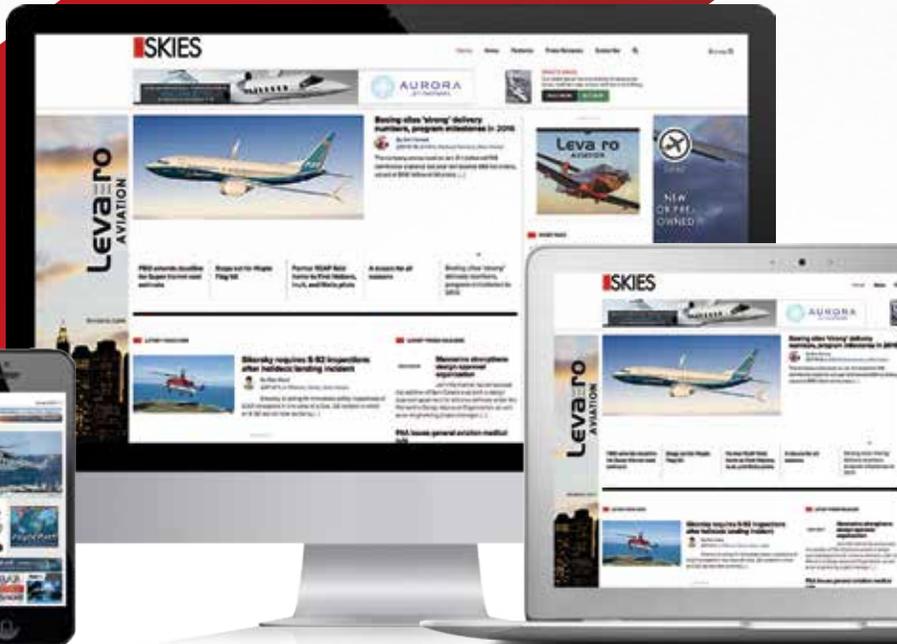
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Aviation is
our passion.

Finally, Eastman revealed that architects are in the early stages of planning a new five-storey Ice House that will be more than twice the size of the existing building, to be constructed over the CDF's current parking lot.

A SEAMLESS PRODUCTION

Passengers might be in a hurry to take off, but for those who take the time to observe the deicing process, it's an impressive sight that could almost be set to music.

Aircraft are guided into the deicing bay by large electronic signboards, with green chevrons advising them to move forward until they are in the correct position.

Once the aircraft is stationary, two to six Snowballs will approach. Each \$1.25-million truck can be driven from the deicing specialist's aerial cab, allowing for one-person operation. Their movements are pre-

cisely choreographed to match set patterns determined by aircraft type, with technical inspectors looking on to ensure procedures are followed to the letter.

When the truck is in position, a telescoping application arm extends and a joystick in the truck's aerial cab controls the glycol dispersal in sweeping movements. As the hot Type 1 fluid meets the cold wintry air, steam rises into the sky.

Within seconds, the trucks exit the deicing area and the aircraft is inspected and then cleared to depart the bay.

Even live propellers can be sprayed, with the glycol applied to the leading edge, although aircraft do need to be shut down for treatment if they have contamination on the prop surface.

As for business aircraft, Eastman said those that are hangared don't need deicing, while

the rest will visit the CDF. Under certain conditions, a prescribed number of slots is available for Pearson's business aviation community.

FUTURE FOCUS

As the CDF plans to expand its physical surroundings, it is also hiring to meet the growing demand for its services.

Thirty-four new deicing specialists were brought on at the end of 2017. The organization promotes from within, and five of the six staff members working the control centre on the day *Skies* visited used to spray planes.

"It's up and down, this job," said Eastman. "[The] stress level depends on weather. You need the ability to get your game going instantly if the weather changes."

After two decades of being at the top of its game, Toronto Pearson's CDF remains a leader in North America. It's not unusual to see representatives from various airports visiting the centre to observe and learn from its operation.

Visitors to the Ice House are always welcome—in fact, they're given a front row seat to view one of the finest choreographed performances in winter airport operations. 

“TO FURTHER SAFEGUARD THE ENVIRONMENT, THE CDF'S ENTIRE RAMP WAS BUILT ON TOP OF A BONDED MEMBRANE THAT PREVENTS USED GLYCOL FROM SEEPING INTO THE GROUND.”



LISA GORDON

Lisa Gordon is Editor-in-Chief of *Skies* Magazine. Contact her at lisa@mhmpub.com.

The CDF's six deicing bays can accommodate 12 narrow-bodies, six wide-bodies or any combination thereof—and the same number of aircraft can be staged behind them, ready to go.



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NORTHERN NextGen?



Unless one has been flying without a radio in NORDDO state for the last few years, most operators know that the U.S. Federal Aviation Administration's (FAA's) Automatic Dependent Surveillance - Broadcast Out (ADS-B Out) mandate clock is ticking.

Still controversial, and bigger than anything like it in the past, the FAA's rule goes into effect in less than two years, with a deadline of Jan. 1, 2020.

U.S. ADS-B Out, the first chapter of FAA NextGen, practically affects *every* user of U.S. airspace at midnight on Wednesday, Jan. 1, 2020.

It's the FAA's successor to tracking aircraft (and separating them) by radar. By the time this *Skies* arrives on your

doorstep, around 460 working days will remain in the belated rush to equip aircraft with the necessary avionics. The bow wave of inquiries hit the avionics shops and OEMs by the end of 2017, yet generally for all sectors of aviation (commercial, biz av, GA), compliance remains well short of the needed pace of installations.

The FAA *will not* postpone the compliance date. The next two years are going to be very interesting.

CANADIAN PERSPECTIVE

Let's switch to a Canadian frequency. Where are we with Canadian ADS-B Out deployment? Where are we going and how are we going to get there?

Nav Canada has already been providing

surveillance separation in certain airspace using ADS-B Out technology since 2009. Early deployment started for ADS-B equipped aircraft in the Hudson Bay airspace, allowing for five-mile separation for the heavy Europe-West Coast traffic.

That was followed by more ground stations to expand coverage to Eastern Canada and four more ground stations in Greenland in 2012, which added ADS-B surveillance over a portion of the North Atlantic Track system. ADS-B equipped operators in this airspace today have the potential for preferred routes, speeds and altitudes, and corresponding reductions in fuel consumption.

Air navigation service providers (ANSPs) are motivated to adopt ADS-B

Nav Canada is currently studying the possibility of an ADS-B Out mandate in Canadian airspace.

► BY NORM MATHEIS



While there seems little doubt about the benefits of ADS-B Out, northern operators are concerned about the financial burden of complying with a potential mandate. An Air Inuit spokesperson said the costs would be “significant.” **Eric Dumigan Photo**



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because they can decommission expensive aging radars, and in the case of Canada it's just not realistic to set up new radar sites in remote regions. By contrast, ADS-B sites are a fraction of the cost.

ADS-B technology also permits a faster update rate as seen at the controller's station. Position accuracy based on the Wide Area Augmentation System (WAAS) is better and the aircraft state and intent information from a modern WAAS navigator is advertised, allowing more aircraft to use our finite airspace with better safety and efficiency.

Within the framework of Canada's Performance-based Navigation (PBN) State Plan, the Canadian Performance-based Aviation Action Team (CPAAT) recommended that Nav Canada carry out

an aeronautical study on the potential benefits and challenges of an ADS-B Out mandate in accordance with CAR 806.

Consequently, Nav Canada is now conducting a study on a performance mandate for the use of ADS-B Out within Canadian domestic airspace.

Nav Canada's aeronautical study process is now underway. Some preliminary analysis has been completed and customer and stakeholder forums will be held early this year. Once complete, the study with recommendations will go to the regulator, Transport Canada, which will make the final decision.

For operators in the Canadian North, an ADS-B Out equipment mandate would most likely impact operations.

“Having reviewed the system for a while now, I agree that it will be beneficial and will revolutionize the way aircraft are managed in controlled airspace,” said Duane Court, Air Inuit's regulatory and compliance manager.

“Is Class G airspace going to receive a major overhaul once ADS-B Out gets mandated in Canada? At Air Inuit, despite having a 100 per cent WAAS-equipped fleet, the costs to upgrade to conform to the current FAA ADS-B Out mandate are significant,” he continued.

“For multiple reasons, some American aircraft operators have opted to equip with UATs [universal access transceivers], but will these aircraft receive complete coverage and meet future Canadian compliance when visiting or transiting

ADS-B technology permits a faster update rate as seen at the controller's station. **Nav Canada Photo**



Surveillance (EHS) [for fixed-wing aircraft], and ADS-B 1090 MHz ES capabilities.

The cut-in date for this requirement is June 7, 2020, but that date is likely to soften and slip to the right. The reason for the slip seems to be some sort of epiphany within the European Aviation Safety Agency (EASA) at this late stage that there isn't the same operational benefit in Europe, as there are no plans to decommission secondary surveillance radars (SSRs).

SPACE-BASED SOLUTION

Enter Aireon satellite-based ADS-B Out.

Nav Canada is a partner in the Aireon joint venture that has ADS-B receivers carried on the Iridium NEXT satellites. Aireon claims that space-based ADS-B surveillance will bypass the limitations of ground-based secondary surveillance radar (SSR), wide area multilateration (WAM) and ground-based ADS-B surveillance systems, and will be fully operational this year.

Aireon will be central to any expansion of Canadian ADS-B Out coverage.

The receiver package of the NEXT satellites can be thought of as a replacement for the land-based receivers deployed and operational for the U.S. and existing Canadian ADS-B Out infrastructure. The payloads will receive ADS-B Out signals broadcast from aircraft equipped with 1090 MHz extended-squitter ADS-B transponders, which operate on the same frequency as traditional Mode A/C/S transponders. UAT operates at a different frequency and won't be supported by Aireon.

Heavy turboprop and turbofan operators are already TCAS-equipped, which required diversity (think antenna on top) Mode S transponders. They'll be able to see the satellites. The upgrade path for that configuration is in most cases straightforward (to extended-squitter diversity transponders).

Northern and remote operators could benefit in other ways when they equip with ADS-B Out. In uncontrolled airspace there is a certain reliance on monitoring TCAS traffic; there will be more visibility now between those systems.

Aireon states it will provide (at no additional cost to registered users) the location and track of ADS-B equipped aircraft to assist in search and rescue, if required.

“NAV CANADA IS NOW CONDUCTING A STUDY ON A PERFORMANCE MANDATE FOR THE USE OF ADS-B OUT WITHIN CANADIAN DOMESTIC AIRSPACE.”

through the Canadian North? Some of our aircraft have received the upgrade to meet the current FAA 2020 mandate; however, as we have aircraft based and operating only in the North, we anxiously await when, how and if a Canadian mandate will be imposed.”

The Canadian study's terms of reference (TOR) exclude uncontrolled airspace, so that airspace likely will not fall under any mandate; however, flights seldom begin and end within that Class G airspace. Often, such flights route through another class of airspace where ADS-B equipment will become mandatory.

The TOR refer to the U.S. FAA and other foreign ADS-B Out mandates. The FAA has mandated aircraft to be equipped to the guidance in the DO-260B MOPS for continued operation in Class A airspace (above FL180). An aircraft mod for this requirement typically includes: a supplemental type certificate (STC) or OEM service bulletin; TSO-C166b

Extended-Squitter (ES) 1090 MHz Mode S transponders and controls; TSO-C146 SBAS/WAAS navigator (to meet data latency and integrity requirements); and flight deck annunciation to alert crew to the loss of ADS-B Out transmissions.

Other U.S. airspace operations will allow for use of lower-cost UAT equipment outside of FL180. (Even though it's called a "Universal Access" transceiver, the 978 MHz UAT is actually less universal than the 1090 MHz ES transponder in terms of where it can fly and what airspace it can use.)

Also being taken into account are other foreign mandates, such as in Europe. That rule states that aircraft operating under instrument flight rules in Europe and with a maximum certified takeoff mass exceeding 5,700 kilograms, or having a maximum cruising true airspeed capability greater than 250 knots, will be required to carry and operate Mode S transponder(s) with Mode S Elementary Surveillance (ELS), Enhanced



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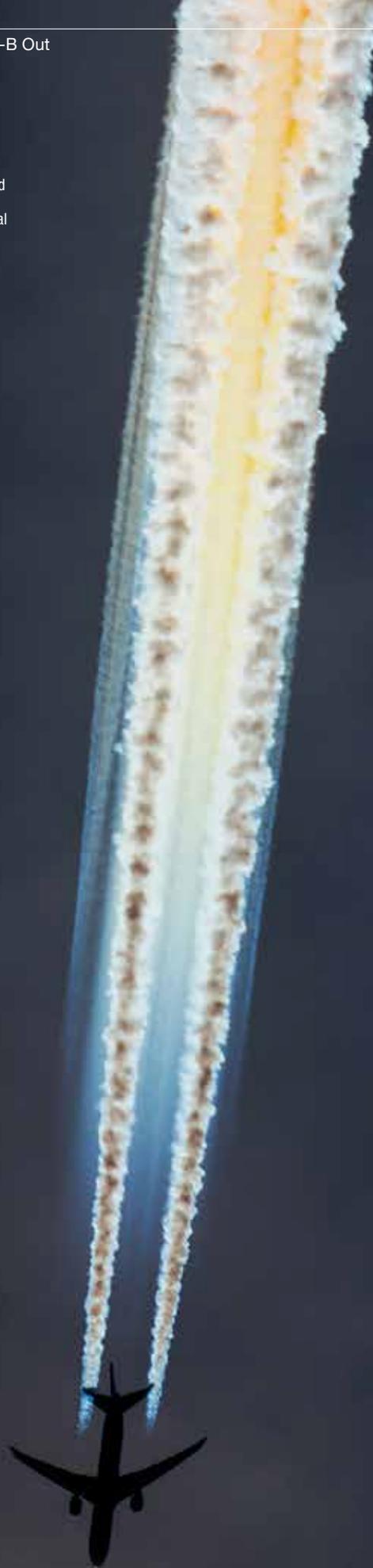
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Aireon claims that space-based ADS-B surveillance will bypass the limitations of ground-based secondary surveillance radar (SSR), wide area multilateration (WAM) and ground-based ADS-B surveillance systems, and will be fully operational this year. **Jan Jasinski Photo**



COST AND BENEFITS

What does it cost to equip with ADS-B Out? That depends on what is already installed in the aircraft.

Using a “needs everything” case of a regional aircraft or a turboprop business aircraft imported into Canada and being prepared for entry-into-service, installed DO-260B ADS-B Out equipage costs could approach US\$250,000 in total, assuming it has neither a WAAS navigator nor the required 1090 ES transponders.

Aircraft already equipped with a WAAS navigator and merely needing to fit the 1090 ES transponders with an STC package may fall into the US\$100,000 range.

Jeff Cochrane, Nav Canada’s director of navigation and airspace, said the ANSP has been careful about the timing of the work they are doing through the aeronautical study, holding on until experts were confident of the benefits, efficiencies and potential for cost reductions associated with an expansion of ADS-B Out.

What does the future look like? Best guess might be a change to Canadian airspace to require DO-260B 1090ES ADS-B Out *after* the U.S. date, with the majority of commercial and corporate aircraft already equipped as driven by the FAA mandate.

Any C-registered operator wanting to run scheduled, charter or corporate flights into the U.S., as well as special ops such as medevacs, will have necessarily equipped to meet regulations south of the border. Additionally, it is sometimes easy to forget that the shortest distance between two points in Canada is often through U.S. airspace!

One interesting point is that there isn’t a lot of visible discussion or demand yet for early avionics conversion incentive programs. Good examples are the FAA’s ADS-B Out rebate program for general aviation and the Localizer Performance with Vertical Guidance (LPV) early adopters’ funding in Europe, where the satellite services provider is contributing many millions of Euros to commercial carriers to offset EGNOS (Europe’s WAAS) LPV installations costs. In business as in life, if you don’t ask, you don’t get.

Operators might be well advised to keep up with the discussions on a potential Canadian mandate. You can assess whether ADS-B Out benefits are in sync with your operational costs, which impact your business.

You have opportunities to state your case. 



NORM MATHEIS

Norm Matheis is a senior avionics sales and marketing professional and an AME E.

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MANAGED shortfall

The RCAF is addressing staffing shortages through targeted and creative retention and recruitment strategies.

● BY CHRIS THATCHER





The Air Force typically has no problem attracting pilot candidates. In the past two years, the RCAF has increased the number of pilots receiving their wings to about 110 from the five-year average of around 95, the number necessary to meet normal attrition rates. **Mike Reyno Photo**



From the time they enrol, it takes most technicians about three years before they are actively fixing aircraft in the field. Here, Canadian Armed Forces personnel from the Tactical Aviation Detachment assemble and conduct start-up checks on a CH-146 Griffon helicopter in Erbil, Iraq. **DND Photo**

The pilotless cockpit may one day become the norm, but for the foreseeable future, pilots will remain in high demand.

Global forecasts by commercial aircraft manufacturers, airlines and industry associations anticipate a need for 500,000 new pilots over the next 20 years, as new routes open and existing markets expand. In Canada alone, more than 7,000 new pilots, flight engineers and flying instructors will be required between 2016 and 2025, according to the Canadian Council for Aviation and Aerospace.

Yet projections by organizations such as the International Air Transport Association suggest those targets will be difficult, if not impossible, to meet.

For military air forces already struggling to retain experienced pilots, aircrews and maintenance technicians, those forecasts are cause for concern. Few will have trouble attracting prospective pilots—applicants who since they were young boys, and increasingly girls, are still drawn to the wonder and excitement of flying a fighter jet or maritime helicopter.

But the lure of commercial paycheques, especially for maintainers, may challenge an air force's ability to hold on to its best people while managing a normal rate of attrition.

The United States Air Force (USAF), for one, has felt the pressure of commercial hiring and a draining operational tempo in recent years. LGen Gina Grosso, the air force's personnel chief, told the House Armed Services subcommittee on military personnel in March 2017 that the entire air force was short 1,555 pilots, including 1,211 fighter pilots, as of the end of fiscal year 2016. The warning prompted Congress to authorize an increase in bonus pay to as much as \$35,000 per year, up from the previous cap of \$25,000, to retain talent.

The Royal Canadian Air Force (RCAF) has traditionally been able to maintain an acceptable 10-year attrition rate of about 6.5 per cent, a turnover necessary to the

overall health of the organization. But with the growing demand for aircrews and maintainers, "we are seeing an uptick and it has increased the pressure," acknowledged LCol Rich Kohli, whose team within the directorate of air personnel strategy monitors occupation health and develops recruitment plans.

At first glance, the RCAF is in reasonably good shape. All aircrew officer occupations are above the 80 per cent range of desired strength: pilots are at about 84 per cent; air combat systems officers are at 80 per cent; and aerospace engineering officers are around 98 per cent.

Maintenance technicians are also well accounted for, averaging around 96 per cent of desired strength, though specific trades such as aircraft structures are about 87 per cent.

But the RCAF is working through a problem that originated in the 1990s, when the federal government cut spending and reduced the size of the military, prompting many to accept a golden handshake before retiring from service. That created a gap in the force that is now affecting training, maintenance, and operations. Those who left would today be among the most experienced instructors, technicians and squadron leaders, with 18 to 20 years of service under their belts.

"We have very few people with 18 years of experience right now," said Kohli. "It would have given us a larger cadre to draw from to fill those critical positions. They would be our most experienced people involved in the line operations."

"It means we have a smaller population of people at that rate. So the attrition of a single senior pilot, for example, in Trenton right now would be felt quite dramatically when there isn't a large group of people to draw from to replace that individual."

Complicating matters further, the RCAF is also experiencing the gradual retirement of the baby boom generation, in many cases the very personnel who picked up the slack when the force was downsized.



The lure of commercial paycheques, especially for maintainers, may challenge an air force's ability to hold on to its best people in the coming years.
Cpl Jean-Roch Chabot Photo

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SKIES Magazine

“We are hitting that demographic bubble where a large number of individuals—about 20 per cent of the Canadian Armed Forces (CAF)—are in that retirement zone and eligible for annuity,” said LCol Elisa Cass, who oversees attraction, in-service selection, research and retention for the directorate of air personnel strategy. “That is still primarily the reason people are leaving.”

She noted, however, that many have opted to remain in the Reserve Force, allowing the Air Force to “keep their corporate skills.” Or, they have decided to return after a stint in the commercial sector, a move her team works to “expedite to the greatest extent possible.”

The RCAF has also welcomed a handful of allied pilots interested in joining the force to bridge that experience gap, but it’s a touchy area since allies have an informal agreement to not “poach” each other’s aircrews. Ultimately, the bubble will have to run its course, said Kohli.

In response to a shortfall of roughly 4,000 maintainers at the end of fiscal year 2016 due to a variety of factors, including budget cuts over the past decade, the USAF took the dramatic step of upping the number of new maintainers it enrolls in the training system each year from 6,000 to 8,000. That has reduced the deficit to just 400 technicians, but created challenges to provide sufficient training platforms.

Unfortunately, even if it were possible, significantly increasing the quantity of trainees will not solve the problem in Canada

without affecting operations, Kohli noted. For one, the RCAF lacks that large pool of experienced instructors and, as commander LGen Mike Hood told the Standing Senate Committee on National Security and Defence in November 2016, “Our occupations are highly technical and require long periods of training.”

“It can take pilots three and a half years just to get their wings and most technicians, from when they are enrolled, take about three years before they are on units fixing airplanes,” said Kohli. “If we are short 200 technicians somewhere, we can’t just have 200 basic qualified people show up tomorrow. We have to bring them up to ensure they develop expertise in their particular field.”

In the past two years, the RCAF has increased the number of pilots receiving their wings to about 110 from the five-year average of about 95, the number necessary to meet normal attrition rates. Not surprisingly, the Air Force has “no problems attracting pilots,” said Cass, with the CAF receiving about 1,000 applicants each year. However, only one third—about 300—survives a rigorous aptitude test at the aircrew selection centre in Trenton, and just 150 to 200 are enrolled annually.

Technicians pose a more significant challenge. In total, the RCAF receives about 425 to 450 maintainers per year into the training system and graduates between 375 and 400, Kohli said. But in fiscal year 2017/18, which runs until March 31, the Canadian Forces Recruiting Group (CFRG) had processed

503 applicants on behalf of the RCAF for aviation, avionics and air weapons technicians, and enrolled 204 as of late December. That is about 100 fewer applicants and 50 fewer enrolled than in FY2016/17, though the RCAF expects to be just short of last year’s intake by the end of the fiscal year.

“We are seeing shortfalls in our annual recruiting targets,” he said, though he emphasized the RCAF remains “discerning” in who it selects for aircrew. “We want to make sure that people who are trained have a high probability of success.”

IN SEARCH OF RETENTION KEYS

As part of a new defence policy released in June, *Strong, Secure, Engaged*, the Canadian government laid out several initiatives to “retain valuable military skills and accommodate changing career paths,” including more flexibility in career options and enticements to encourage more former Regular Force personnel to remain in service by transitioning to the Reserve Force.

It also proposed a comprehensive CAF-wide retention strategy. In conjunction, the RCAF is now developing an Air Force-specific plan, gathering evidence-based research from a variety of sources and directly from members to identify “key things we need to focus on,” explained Cass. That will include a way for members “to anonymously make suggestions that would help retain them longer” through the RCAF website.



Only one third of RCAF pilot applicants survives a rigorous aptitude test at the aircrew selection centre in Trenton, Ont. **Mike Reyno Photo**



The RCAF is putting a greater emphasis on simulation in pilot training, reserving precious flying hours for operations. **Mike Reyno Photo**



The RCAF has noticed a shortfall in its annual recruiting targets for fiscal year 2017/18, which runs until March 31, largely for aviation, avionics and air weapons technicians. **Mike Reyno Photo**

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The reasons for leaving the military are as varied and personal as the reasons for why members originally joined, and what might entice them to remain in service is equally diverse. Kohli noted the RCAF commander has “limited levers” and focuses on job satisfaction and ensuring people have the tools to do the job well within the RCAF, while working with the Military Personnel Command on things like retention bonuses or other benefits packages.

As RCAF commander, Hood has also launched a concerted effort to encourage the flow of innovative ideas. “While I uphold the chain of command for the controlled use of force and for military operations, I am flattening the organization when it comes to sharing and considering innovative ideas from all ranks and occupations,” he explained to the Senate defence committee in 2016. “In our online forums we have aviators commenting on complex ideas alongside generals and colonels. That is a cultural evolution that I want to see continue to grow.”

To date, that approach has included a Vector Check modelled on the popular TV show, *Dragon’s Den*, which provides any aviator with a chance to “sell” senior leadership on an idea or solution, and the launch of an innovation hub in the Waterloo, Ont., technology triangle intended to expose Air Force personnel to the tech entrepreneur mindset. That cultural change in the RCAF alone may encourage airmen and airwomen to remain in service, but Cass’s team will also be monitoring the “suggestion box” for any novel ideas around retention and recruitment.

TARGETED RECRUITMENT A STRATEGIC GAME

The defence policy also committed to grow the CAF to 101,500 personnel, an increase of 3,500 for the Regular Force to 71,500, and 1,500 for the Reserve Force to 30,000. Much of the growth is aimed at filling needs in space, cyber and intelligence-related occupations, but could include additional aircrews and technicians as the RCAF introduces new maritime helicopter and fixed-wing search and rescue (SAR) fleets, considers expanding its SAR helicopter fleet, and moves forward with a plan to acquire new fighter jets and remotely piloted aerial systems.

A senior government official acknowledged during a briefing in December that even the interim fighter program, which will see delivery of 18 Australian F/A-18A/B Hornets to augment the current fleet, could mean a need for more pilots and technicians, and that “retention and recruitment efforts were underway.”

While flying or working on cutting-edge aircraft is admittedly “a huge hook” to attract talent, the Air Force nonetheless faces stiff competition for skilled trades and technology workers, said Kohli.

All sectors are chasing the same demographic, so the military has had to experiment and be “adaptive to the marketing strategies [of] our competition,” said LCol Dan Mainguy, the senior staff officer for



The reasons for leaving the military are as varied and personal as the reasons why members originally joined. The RCAF commander is focusing on job satisfaction and ensuring people have the tools to do their jobs well, in an effort to bolster retention. **Mike Reyno Photo**



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marketing and attractions with the CFRG.

The CFRG applies benchmark enrollment criteria provided by the Army, Navy and Air Force to deliver increasingly creative and often very targeted recruitment campaigns, using online and various social media channels and face-to-face specialist recruiters to identify and interact with potential candidates. One program, called Ask Me Anything, gives prospective candidates direct online access for an hour to a serving member of similar age to answer any questions about their job.

“It is a very strategic game, played out tactically across the country,” he said. “We really have to create a value proposition as part of our marketing strategy to be competitive alongside industry. We do very well as far as offering a salary that is relatively competitive with the rest of industry, but we have to sell all of the other intangibles [such as] professional development throughout a career, diversity of employment, diversity of location, bilingualism, pension benefits...to be more competitive.”

Aerospace-specific programs at trade schools and colleges have also become a prime target for RCAF and CFRG specialist recruiters. Members of Cass’s team have audited aircraft maintenance courses to understand the skills students acquire and are finding “between 70 to 90 per cent of our core military material is being covered,” she said. “Those programs are so well delivered that oftentimes the training that we have to provide is very minor once they come in.”

To encourage students to consider the RCAF before embarking on a commercial sector career, the Air Force is also marketing the fact that journeyman status for most trades can be acquired in much shorter time and at far less cost.

And it is providing credit for such programs by shortening the length of some courses once a trainee has completed basic training, and accelerating promotion.

“Both pay and rank are biased to recognize what they are bringing to the table as semi-skilled entrants,” said Kohli.

WORKING SMARTER

Personnel shortages are often cyclical and carefully managed to minimize their impact on operations, but retention and recruiting issues will likely remain a constant challenge as Canadian demographics continue to change. So the Air Force will have to work smarter, Kohli acknowledged. That will mean greater use of simulation in the training system and to keep pilots current, reserving precious flying hours for operations.

In December, Hood directed staff to look at using other air operations officers to perform operations tasks, keeping qualified pilots focused on flying. And an air combat systems officer (ACSO), rather than a pilot instructor, may provide the initial cadre of unmanned aerial systems pilots. “It may require a dedicated operator or we may be able to continue on the ACSO route, or

we may find that a pilot is actually required,” Kohli explained. “It will depend on the hardware of the system that we put into place.”

New fleets with ever more complex sensor systems will also mean fundamental changes for technician training. More maintenance will be contracted, meaning “maintainers won’t need to know how every one and zero is working inside the box. They [will] need to be more focused on management of the systems, to be more aware of software versions,” said Kohli.

The pilotless cockpit is estimated by some to be a decade away, though militaries, despite embracing unmanned drones, will take decades more to be totally comfortable with

the idea of no pilots in their fighter, transport, maritime patrol and tactical aviation fleets.

In the meantime, they will have to continue applying innovative and focused personnel strategies to attract and retain the aircrews and technicians needed to keep those aircraft flying. And if some do seek opportunities in the commercial sector? Canadian aviation will be the beneficiary of well trained, high quality people. ■



CHRIS THATCHER

Chris Thatcher is an aerospace, defence and technology writer and a regular contributor to Skies.

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ACS provides composite component repair services for the ATR 42 (shown) and 72 line of aircraft, as well as Bombardier Dash 8 turboprops. **Mark Taylor Photo**



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In the early days of the helicopter industry, rotor blades were disposable items. If they were damaged or defective, they were simply removed and replaced. Repair was not an option until the 1970s, when a handful of companies began developing the art and science of composite helicopter rotor repair.

One of those companies, Composite Technologies in Winnipeg, Man., employed a young Bruce Anning, who dedicated eight years to learning the craft of rotor blade repair.

Anning later ventured out on his own, establishing Advanced Composite Structures (ACS) in 1988—a company dedicated to providing composite component repair services for fixed- and rotary-wing aircraft.

“I took the knowledge, technologies and

the training that I had acquired and applied it to a broader part of the industry, which was composites as a whole,” Anning told *Skies*, adding that he avoided rotor blade repair out of respect for his former boss and mentor, Keith Harvey.

Today, ACS is celebrating its 30th anniversary and has broadened its work scope to include composite component repairs such as passenger/cargo floor panels, flight controls, interior and wall panels, cowlings, engine nacelles, radomes, and elevators for both planes and helicopters.

While Anning initially excluded rotor blade repair from his repertoire, he was ultimately compelled to return to his roots.

“Eventually I came back around to my passion, which is helicopters,” he said. “My expertise is in rotor blade repair and

implementing repair designs that are essential in order to support the helicopter industry.”

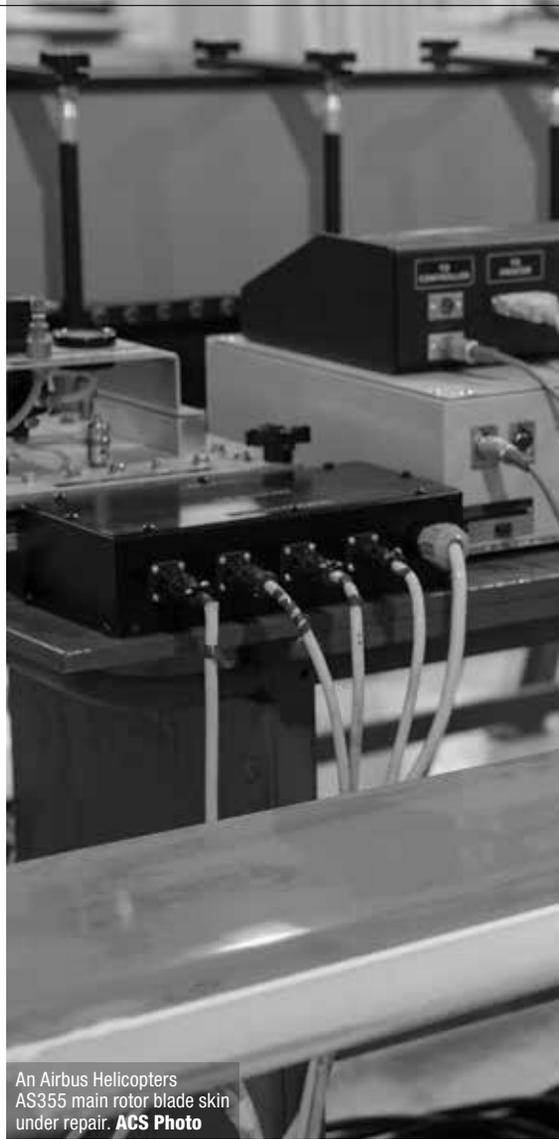
ACS currently repairs rotor blades for most of the major OEMs, including Airbus Helicopters, Bell Helicopter and Sikorsky’s various models. On the military side, the company completes repairs for the Bell AH-1 Cobra, the Boeing AH-64 Apache and the Sikorsky UH-60 Blackhawk, among others. And in the fixed-wing arena, ACS does composite component repairs for all Boeing and Airbus jetliner models, as well as ATR 42/72 and Bombardier Dash 8 turboprops.

While ACS does not currently work on fixed-wing composite propellers, Anning said it’s on the company radar. He believes the technology used to repair composite rotor blades is transferable to propellers.





Rotor blades used to be considered disposable items. Today, ACS specializes in rotor blade repair for most of the major OEM models, including Bell 407 firefighting support aircraft. **Ed Garza/Bell Helicopter Photo**



An Airbus Helicopters AS355 main rotor blade skin under repair. **ACS Photo**



Machinist Eric Desmet operates the computer numerical control (CNC) machine in support of rotor blade repair tooling development. **ACS Photo**



The Oceania rotor blade repair centre in New Zealand. **ACS Photo**



An Airbus A320 thrust reverser on the shop floor at ACS's Winnipeg location. **ACS Photo**

UP, UP AND AWAY

Three decades ago, ACS had just three employees. Today, the company roster stands at nearly 70 staff members spread among four locations, including its Winnipeg headquarters and locations in Sanford, Fla., Stockton, Calif., and an affiliation with Oceania Aviation in Papakura, New Zealand.

The company got a major opportunity when it landed its first contract with Boeing Canada, at a time when the build rates for the Boeing 737 were exploding. Anning realized that focusing on the manufacturing processes for that particular aircraft could lead to big business for ACS.

He was right. The revenue followed, as did more business opportunities. In 2007, ACS was approached by Oceania Aviation, a large New Zealand-based helicopter service company that was looking to augment some of the products and services it was offering on the other side of the world. Oceania met with ACS and saw some of its products, becoming convinced that the Canadian company would be the perfect business partner.

"We were just a quiet little company in Winnipeg, and [we were] doing a really good



job,” recalled Anning. “We took the [Oceania] challenge on. . . . And to this day it is doing extremely well.”

With this success, ACS inevitably expanded into the United States in 2011, opening a facility in Sanford, near Orlando, that has become its biggest location. Florida is a major helicopter hub due to its geographical location and presence of a large number of operators and MROs.

This success has led the company to consider building a new 50,000-square-foot, state-of-the-art rotor blade and composite repair centre, replacing the three current hangars that ACS Florida operates from at Sanford International Airport.

But ACS’s expansion didn’t end with Florida. In 2015, the company acquired Rotor-Tech International (RTI) in Stockton, Calif., which specializes in a full complement of rotor blade repair services for all makes and models. Anning said that location will soon be known as ACS California.

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Much of ACS’s continued success can be attributed to the company’s exacting standards and high-quality work, summed up by the slogan, “We fix problems, not symptoms—using sound, solid solutions.” “We uncover the real core problem and fix it—and fix it correctly,” said Anning, adding that ACS delivers long-lasting repairs that keep aircraft safely in the air while saving operators money. He believes ACS’s success is also due to its status as a third-party maintenance, repair and overhaul (MRO) facility, which is not affiliated with any major manufacturers. This allows the quality of the company’s work to speak for itself.

Anning said an independent company like ACS has a greater ability to customize its services and maintain a more personal relationship with its customers.

PLANNING FOR THE FUTURE

The next frontier for ACS appears to be Western Canada, where it plans to expand its fixed-wing repair services. (While the fixed-wing industry in Canada is large enough to support two repair facilities, ACS is still uncertain whether or not the Canadian helicopter industry could support more than one centrally located rotor blade repair facility.)

“There’s really a lot going on out there,” said Anning, adding that ACS is looking into establishing other rotor blade and composite repair centres worldwide. The company aims to open a western composite repair centre sometime in 2018, with further interest in both Europe and South America.

Future opportunities for ACS are diverse, but firmly rooted in the company’s aviation industry expertise. For example, Anning said he has been approached by wind energy companies who are looking to consult on solutions for wind turbine blade erosion.

ACS has achieved great successes over its three decades in the fixed- and rotary-wing repair business. As it positions for a strong and diverse future, Anning reflected on the values instilled by his mentor, composites pioneer Keith Harvey, who inspired him to be passionate about the opportunities in the field of aircraft repair and to remain customer-driven.

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DAYNA FEDY

Dayna is junior editor of *Skies* magazine. She completed her undergraduate degree in communication studies in June 2017, joining MHM Publishing later in the year to pursue a career as a writer and editor.

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PROGRESSIVE by nature

Thinking outside of the box is a deliberate strategy in Edmonton, home to one of North America's most progressive airports.

▶ BY BEN FORREST | ▶ PHOTOS COURTESY OF EIA

About a year ago, in the wake of a brutal recession that may go down as the worst in Alberta history, Maureen McCaw reflected on the role an airport plays in its community. “An airport is a mirror of its community,” said McCaw, who at the time was chair of the Edmonton International Airport (CYEG) board of directors.

“An airport reflects its region’s personality and helps drive its economy and forward its goals. Arguably, an airport’s biggest job is to maintain a position of economic strength and confidence, regardless of—in spite of—external conditions.”

That was the challenge CYEG faced at the time, just as it does now, as the economy begins to grow again. If any airport is a mirror of its community, it is Edmonton International.

As the city goes, so goes the airport. “Everything that we do, we do in a very pure sense to create socio-economic benefit for our community,” said Tom Ruth, president and CEO of the Edmonton Regional Airport Authority, which manages CYEG and nearby Villeneuve Airport (CVZL).

Edmonton International is Canada’s fifth-busiest airport and its largest airport

by land area, situated on more than 7,000 acres just south of city limits.

More than 7.1 million passengers passed through CYEG last year, a number that does not include statistics for December, which were unavailable at press time.

That’s a significant improvement over 2016 and 2015, which saw a drop in traffic due to a recession driven by low oil prices and devastating wildfires.

Total aircraft movements for 2017 were 134,908—down about 0.5 per cent from the previous year. Villeneuve, a general aviation airport, experienced 60,000 aircraft movements in 2017, roughly on par with 2016.

But with a few exceptions, the story of CYEG is one of exponential growth.

The city’s original airport—opened in 1927 to accommodate a flight school near the downtown core—was an important military airfield during the Second World War, but the city quickly outgrew it.

Transport Canada bought the current airport lands for about \$1.5 million, and on Nov. 15, 1960, CYEG opened for passenger service.

During the 1970s and ’80s, the airport handled a second generation of wide-body jets like the Boeing 747 and Lockheed

1011, which flew non-stop to Europe.

Passenger volumes declined between 1983 and 1995, but noise concerns prompted the end of large commercial flights to the downtown airport and consolidation at CYEG.

Within four years of consolidation, 3.8 million passengers were using CYEG, and the numbers have grown remarkably ever since.

Air Canada and WestJet are major tenants, and several smaller Canadian carriers also operate out of the airport, including Jazz Aviation LP, Canadian North and First Air.

Three fixed-based operators (FBOs) offer services: Executive Flight Centre, Signature Flight Support YEG (operated by Aurora Jet Partners), and YEG FBO Services Inc./Shell Aerocentre.

Nav Canada provides air traffic control with a new tower atop the airport’s eight-story Central Tower, which also houses offices for Nav Canada and CYEG staff, as well as the headquarters of Canadian Helicopters.

HNZ Topflight also trains pilots at CYEG in a state-of-the-art Airbus Helicopters flight simulator that is the first of its kind in North America.

Canadian North has an advanced Boeing 737 simulator at CYEG and plans to open a new manufacturing, maintenance, repair and operations facility at the airport this year.

Air cargo is big business at CYEG, with volumes that continued to grow during the economic downturn.

Global logistics leaders FedEx and DHL have significant operations at CYEG, along with Canada’s largest cargo airline, Cargojet.

While air service is the most important aspect of CYEG, commercial development is also critical to its goal of creating a so-called “airport city.”

A 585,000-square-foot shopping mall is slated to open on airport lands in 2018, along with a horse racing facility that is expected to be the second-largest in Canada.

Costco is scheduled to open a 150,000-square-foot facility on the west side of the mall in 2018, and Aurora Cannabis is building a massive 807,000-square-foot marijuana greenhouse and processing plant on airport lands.

All this is part of a deliberate effort to think outside the box when it comes to generating revenue and fulfilling the airport’s mission to be an economic driver.

“We are arguably the most progressive airport in North America right now in terms of the pace of commercial development,” said Ruth.

As the economy rebounds, the airport is expected to grow again, with a goal of reaching 10 million passengers by 2025.

It’s expected a third runway will eventually be needed, and the airport hopes to become a destination as well as a waypoint.

“I really do think we need to be a reflection of the community,” said Ruth. “[We] need to be a huge community asset in order to help our region thrive.”

Column

INSTRUMENT IQ BY JOHN MONTGOMERY

John Montgomery is the founder and president of Professional Flight Centre in Delta, B.C., which was established in 1986. A 12,000-hour ATPL pilot and multi IFR instructor, he also specializes in ground school and seminar instruction. John can be reached at john@proifr.com.



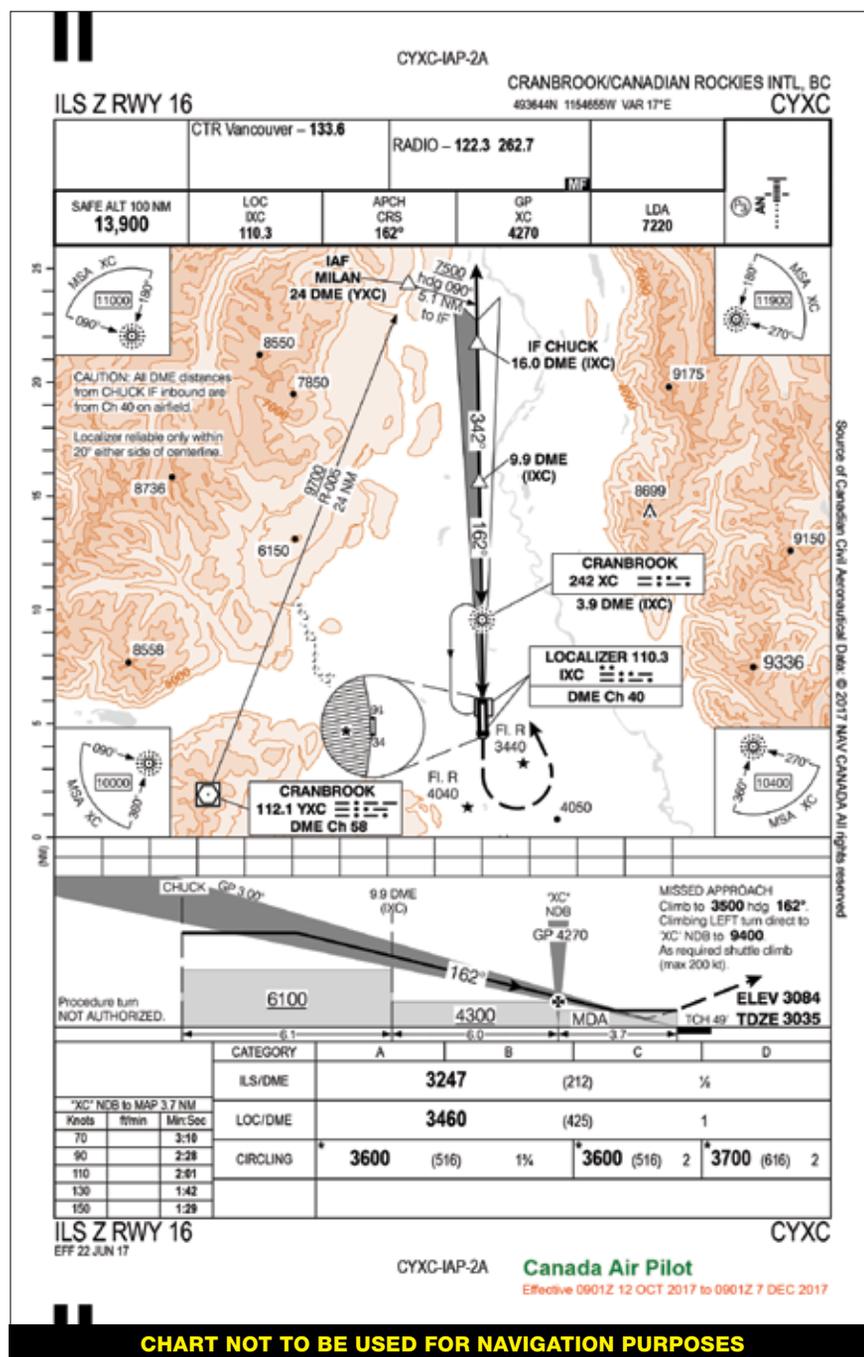
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Meet PO 2 Warren Beattie

Shipborne air controller, Royal Canadian Navy



Not long after summer settled in on the Hawaiian Islands in 2016, Petty Officer Second Class (PO 2) Warren Beattie, a shipborne air controller with the Royal Canadian Navy, entered one of the most challenging stretches of his career.

Beattie was aboard HMCS Calgary, a Halifax-class frigate engaged in Exercise Rim of the Pacific (RIMPAC), the largest international maritime exercise involving nations with an interest in the Pacific Rim region.

About 40 countries were involved in the biennial exercise, which takes place off the coasts of Hawaii and South Carolina. HMCS Calgary was directing a simulated submarine-hunting campaign with multiple aircraft from many corners of the globe.

"This is all real, but simulated—so, friendly forces acting as opposing forces," said Beattie, 44, who occupied an air traffic control-type role that involved liaising with pilots to ensure their safety and a successful mission.

"So, not [a] real threat. But still, the coordination effort is—I find that probably the most stressful environment. Just the number of working pieces that are involved and making an operation like that actually run smoothly can be quite stressful."

It was a chaotic experience, and far from typical for Beattie, who has been a shipborne air controller since 2009 and is one of only a handful of Canadians with NATO Grade Alpha qualifications. But it had elements of what he likes most about the job.

"It's not the same day-to-day, and it requires improvisation, always—and I like that," he said, referring to the nature of his profession. "It forces you to think a little bit outside the box."

Beattie was born in Victoria, B.C., and grew up there as an avid athlete—a bike racer who worked at a local bike shop, he said. But in his late 20s and early 30s he developed a desire to do something for his country.

"It's a privilege, living in Canada, and a lot of opportunities had come my way," he said. "I don't have children myself, but I want to make sure that the future of Canada is free and we have that ability to embrace the world and just be the best people that we can—be the example for the rest of the world. And I thought that being part of the military would do that."

Joining the Navy allowed Beattie to be stationed in B.C., so he signed up at age 32 and entered basic training in St. Jean, Que.

After graduation he was posted to HMCS Algonquin in Esquimalt, B.C., and he entered further training there—as well as in Halifax, N.S., where he became quali-

A shipborne air controller is the link between a ship and the aircraft that interact with it, helping ensure safety of flight. It can be as simple as liaising with a search and rescue helicopter landing on the deck of a vessel, and as complicated as coordinating simulated attacks for training missions like RIMPAC.

"It's that voice in the sky saying: 'Hey, I have you,'" said Beattie. "I'm going to keep you safe and I'm going to talk to you, and if things go south or start getting bad, then I can direct you either on to the deck of the ship or to a safe place to land."

NATO Grade Alpha is the highest level a shipborne air controller can attain, and it places Beattie in rare company. Only seven officers in Western Canada have earned the qualification.

"It's really, really good," he said. "This is an excellent place to be—where you're going onto the ships in a mentorship capacity and bringing up the skill sets of your peers."

Beattie occupies a supervisory and assessment role within the Canadian Forces, and his NATO qualifications allowed him to be posted to Sea Training (Pacific), part

“NATO GRADE ALPHA IS THE HIGHEST LEVEL A SHIPBORNE AIR CONTROLLER CAN ATTAIN, AND IT PLACES BEATTIE IN RARE COMPANY.”

fied as a naval combat information operator (NCI Op), his core trade.

The opportunity to become a shipborne air controller arrived in 2008, and Beattie jumped at the chance to branch out. He trained for the position in Victoria and settled into a role he hopes to fill for the rest of his career.

"It's a voluntary position, and if I didn't love doing it then ... I could just stop doing it," he said. "But I will be doing this for the rest of my career, and it's only going to get better."

of a program that generates, operates and maintains maritime forces for Canada.

So far there have been few experiences as chaotic as hunting submarines at RIMPAC, but every day requires being nimble and thinking on his feet—a requirement Beattie embraces and enjoys.

"You get all your ducks in a row and the aircraft takes off, and then who knows? Things change on the fly, all the time," he said. "It's a fantastic opportunity, and I love doing it." ■



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