



National  
Defence

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ISSUE 3, 2021

# Flight Comment



## DOSSIER

Stay calm and Flight Safety on

## MAINTENANCE IN FOCUS

The Big Picture

## VIEWS ON FLIGHT SAFETY

Director of Flight Safety

Canada

Cover – Master Corporal Brendan Collins, a Medical Technician with 417 Combat Support Squadron is inserted by a CH-146 Griffon rescue helicopter on a hilltop outside Kamloops, British Columbia during Operation LENTUS on July 20, 2021.



## Fire For Effect

14



## How 'Bout that Weather?

20



## Intimidation and CRM

22



## Sled Strap Mishap

27



## The Whole Story

29



## Food For Thought

30

Photo: Cpl Jay Naples, MRRPA/Imaging Services, C1F

# Flight Comment

## TABLE OF CONTENTS

### Issue 3, 2021

#### Regular Columns

Views on Flight Safety	2
The Editor's Corner	3
Good Show	4
For Professionalism	5
DFS Commendation	13
Maintenance in Focus	14
Check Six	16
On Track	17
Dossiers	20
Lessons Learned	27
From the Investigator	32
Epilogue	33
The Back Page	35

#### Lessons Learned

Sled Strap Mishap	27
It's In The Bag!	28
The Whole Story	29
Food For Thought	30

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#### THE CANADIAN ARMED FORCES FLIGHT SAFETY MAGAZINE

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# Views on Flight Safety

by Colonel Jean-Philippe Gagnon

I am honored and elated to assume the duties and responsibilities of the Director of Flight Safety and I am grateful to the RCAF Commander to have entrusted me with leading this important organization.

First, I wish to sincerely thank Brigadier-General John Alexander for his leadership of the Flight Safety organization over these last four years. He guided the team through difficult investigations including most recent accidents and has moved countless initiatives forward that will continue to promote a healthy Flight Safety program across DND for years to come. I take the baton from him at full speed and hope to keep the impressive pace he has set.

I come to the DFS position having been involved with Flight Safety (FS) throughout my career. Initially as an ACSO on the Sea King helicopter, and eventually as a Pilot on the Aurora. I had the chance to be a Unit Flight Safety Officer (UFSO) at the squadron (SqN) level in the mid-2000's and I continued to be a strong proponent of the program as I took on increasing leadership positions at the operational level.

After a few months in the DFS seat, I am reminded of how fortunate we are to have such a strong Flight Safety culture in DND. The Flight Safety program has been enduring since its inception in the Second World War and has seen many improvements over the years to reach what is today, undoubtedly one of the best in the world. The DND/CAF Flight Safety program is rooted in a solid understanding of the Just Culture at all levels, ensuring anyone can openly report incidents that are the result of honest mistakes without fear of retribution.

As DFS, I am responsible to the RCAF Comd in managing and promoting the Flight Safety program across the CAF, while also designated as the Airworthiness Investigating Authority (AIA) by the Minister of National Defence. This title has great significance because it is under the authority granted to the AIA by the Aeronautics Act that comes the legal responsibility of investigating all military aviation occurrences. The DFS organization at NDHQ has the luxury of having dedicated professionals assigned to these two roles operating relatively independently from one another, yet working collaboratively on many issues. DFS 2 personnel, led by LCol Andy Haddow, are responsible for the investigations, while DFS 3 personnel, led by Col (ret'd) Steve Charpentier, are responsible for the promotion and international liaison, including the publication of this fantastic *Flight Comment* magazine. The duality of responsibilities mentioned above, is also reflected in all levels of the Flight Safety team. For example, a UFSO is responsible to their Commanding Officer (CO) for the management and promotion of the Flight Safety program, while also responsible to the AIA when conducting incident/accident flight safety investigations.

While this division is well understood amongst the Flight Safety team, it must also be embraced and respected by the chain of command. I remember as a CO, being entrusted with a great deal of responsibility and accountability for everything in your Unit, the temptation exists to want to know how the Flight Safety investigations are progressing or even inject some input or vector check to your UFSO. It is only human nature to want to understand the problems that may be present and strive for

solutions to improve your Unit. However, this is one place where the chain of command must remain at arm's length in order to allow the FS team to conduct their investigations independently and unprejudiced. The chain of command can then wisely consider implementing recommended preventative measures to avoid repeating similar mistakes.

The leadership team also play an important part in promoting a healthy Flight Safety program at their Unit. They set the tone and expectations that will shape the Flight Safety culture not only at their Unit, but for years to come throughout DND as personnel move to different Units. They do this by embracing and promoting the Just Culture concept, leading to open reporting of incidents/accidents. This is what gives the Flight Safety program its legitimacy and endorses a strong reporting culture. As I start my tenure as DFS, this is one aspect that I will continue to emphasize, not only with the chain of command, but also with every member of DND that I will have the pleasure to encounter.

I look forward to connecting with all members of the Defence Team as CWO Carl Phaneuf and I will be starting our annual road show this fall where we will continue to promote this outstanding DND/CAF Flight Safety program. Be sure to engage us on the sidebar of our presentations to keep the open conversation going and share your experience and advice on how we can continue to improve our great Flight Safety culture for years to come. 🍀

# The Editor's Corner

by Maj Jill Sicard, DFS 3-3

As I sit in front of the computer screen on the first edit job for *Flight Comment* Magazine, my eyes are glued to every word, every mark of punctuation; I sometimes get lost in the overall idea for the piece. However, when my job is done, I sit back and read it in its entirety. I then find myself smiling, finally able to see how the completed project fits together and makes sense.

In this issue, I want that idea to shine through, not only in my editing of course, but in the Flight Safety culture at large. Seeing the big picture and being a significant contributor is more than just what is on our dashboards; when you, the reader browse through the pages, my goal is to make you think about something more than just your job, your Unit or your Squadron. I want you to see the Flight Safety culture as a whole and how it may affect other aspects of your life. In doing so, this edition starts off with some great awards for people who have looked beyond the job title and put safety first.

Our *Maintenance in Focus* article is an excellent example of looking beyond your desk and thinking about the outcome of a decision made when we are sometimes physically or mentally removed from the direct consequences of our actions. I couldn't agree more with the author on the importance of indirect hazards caused by uninformed decision-making, which I am sure we can all relate to, at one time or another.

Understanding ATC intentions and situational awareness are imperative in order to get the "big picture" when flying. In the latest installment of *On Track*, we explore and clarify Canadian Air Traffic Control's (ATC) use of 'direct routing' clearances with lower altitudes than what may be published on instrument charts; giving us a larger image of what happens behind the scenes.

For the *Dossier* section this quarter, our own Flight Safety expert Col (ret'd) Steve Charpentier contributed an article about cause/effect relations when it comes to flight safety and the importance of having a clear mind and full understanding before jumping to conclusions. Cuz, y'all know what happens when we assume things... Another vital aspect that relates to this issue's theme is Crew Resource Management (CRM). Your team's capability depends on effective CRM and as you will read, it can be hindered by intimidation in the cockpit or work environment and can cause more than just a communication breakdown. Lastly, Maj Asselin, 17 Wing FSO will provide you with the most reliable weather sources for flight planning which can be tricky with today's "techy" options. You never want to be caught in a bad weather situation because of misinformation!

We have three very relevant *Lessons Learned* articles from members of the RCAF that fit perfectly with the theme of understanding the whole story behind an incident, as well as a re-print of an article from 1983. This thought provoking tale touches on how our decisions have a ripple effect and will surely make you think twice... because what happens in Vegas, does not always stay in Vegas.

A noteworthy addition is a book review on *Quietus: Last Flight* by Anne Gafiuk, who wrote a powerful piece on pilots from WW2. It explores the details of training hazards and common crash incidents due to lack of experience. The author permits us to peek into the real life stories, allowing us to understand why these individuals sacrificed their lives for God and country, some even before completing their training.

I hope you enjoy this issue and it helps you re-focus on the "Big Picture" in terms of Flight Safety. Please feel free to contact DFS with articles, comments and concerns so we can keep producing a magazine worth reading! 🍷

# Good Show

For Excellence in Flight Safety

## Corporal Kendall Daniels-MacLanders



On August 5<sup>th</sup>, 2020 while off the coast of Norway, Cpl Kendall Daniels-MacLanders was assisting in training HMCS *Toronto* ship without air detachment (SWOAD) personnel. As a qualified deck handler, he was supervising a ship's company member carrying out helicopter in-flight refueling (HIFR). As the HIFR hose was being drawn towards the helicopter, a portion of the member's life jacket became entangled. Simultaneously, the helicopter moved laterally off the side of the ship causing the member to be dragged towards the edge of the ship's deck.

Realizing that the member was in distress, Cpl Daniels-MacLanders immediately leapt forward and grabbed the member. By doing so, both he and the member were pulled onto the ship's netting. Cpl Daniels-MacLanders then maintained one hand on the member and one hand on the ship's edge in an attempt to keep the member from going overboard.

The helicopter crew noticed the developing incident and repositioned over the ship. This reduced the tension on the hose and allowed Cpl Daniels-MacLanders to fall back onto the ship's deck. When he fell he was able to pull the entangled member onto the deck with him.

While other crew began disentangling the member from the hose, Cpl Daniels-MacLanders remained on the scene ensuring the member's safety. He then escorted the member to a secure location and stayed with him until the helicopter left the area.

Cpl Daniels-MacLanders' vigilance, situational awareness, and immediate action mitigated a potentially hazardous incident which could have seen a member being dragged overboard. He is very deserving of this *Good Show* Award. 🇨🇦

# For Professionalism

For commendable performance in flight safety

## Corporal Christopher Andrew



**O**n 8 February 2021 while conducting routine fault finding on a Chinook helicopter's Control Display Unit (CDU) malfunction, Cpl Christopher Andrew, an Avionics System Technician (AVS), identified wire damage in the W716 wire bundle.

While metering for a "short to ground," Cpl Andrew noticed that the short was occurring in an area that had a visible repair.

After removing multiple layers of PRC and vulcanizing tape, he discovered damage to multiple wires. The wire bundle connects the General Purpose Processor Unit (GPPU) in the Avionics Bay to the Control Display Unit (CDU) in the cockpit. These are components of the Avionics Management System (AMS) and provide critical control of the flow of flight data to a myriad of advisory, navigation, and communication systems.

Cpl Andrew prevented what could have become a serious in-flight emergency. His attention to detail, meticulous fault finding skills, and willingness to go the extra mile, set an exemplary standard and he is very deserving of this *For Professionalism Award*. 🇨🇦

# For Professionalism

For commendable performance in flight safety

## Corporal Timothy Brooks



During a scheduled inspection of a CT114 Tutor ejection seat, Cpl Timothy Brooks, an Aircraft Structures Technician (ACS Tech) from 431 SQN, noticed that a newly acquired drogue chute was missing a small piece of fabric that should have been sewn to the base of every riser. This small piece of fabric ensures an efficient deployment of the drogue chute, a component which stabilizes the seat as it departs the airframe in the event of an ejection.

Cpl Brooks immediately alerted the Chain of Command and the non-conformance was reported to the Life-Cycle Materiel Manager (LCMM). Since this was new stock, the LCMM contacted the manufacturer. The manufacturer reported that two lots of chutes were known to be missing the critical piece and the squadron was asked to quarantine the components. Five aircraft were found with the non-conforming drogue chute.

Cpl Brooks' attention to detail and his professionalism in thoroughly inspecting the serviceability of the items that had been purchased, potentially prevented a serious incident. Cpl Brooks is highly deserving of this *For Professionalism Award*. 🇨🇦

## Corporal Alexandre Doucet



While on deployment in support of Op CARIBBE, Corporal Alexandre Doucet, an A Level Aviation Systems Technician (AVN) with 407 Long Range Patrol Squadron, discovered cracks in the number three engine mount of an Aurora aircraft (CP140103).

Following an in-flight anomaly consisting of abnormal yaw oscillations, Cpl Doucet was tasked to carry out a conditional inspection of the entire aircraft. Special attention was to be

given to the number three and four engines due to fluctuations in shaft horsepower that had been observed by the flight crew. While inspecting the interior of the number three engine, Cpl Doucet noticed a small amount of peeling paint located on the inboard lower v-brace attachment point. Noting the discrepancy, he investigated further by thoroughly cleaning the affected area and removing the affected paint. His efforts revealed two cracks in the v-brace bracket where the engine is attached to the quick

engine change unit (QECU). Upon his discovery of the cracks, Cpl Doucet immediately notified his deployed Crew Chief.

Cpl Doucet's thoroughness and attention to detail demonstrated a high level of safety mindedness and professional dedication. Cpl Doucet's extra effort is commendable and worthy of this *For Professionalism* award. 🇸🇨

# For Professionalism

For commendable performance in flight safety

## Corporal Philippe Doucet



**O**n the evening of 16 November 2019, Corporal Doucet, an Aviation System Technician at 435 transport and Rescue Sqn, displayed superior knowledge and professionalism when he detected cut wires on an aircraft main landing gear (MLG). His follow on actions ultimately led to a fleet wide inspection to correct the deficiencies.

While conducting a before-flight inspection (B-check), he discovered chafed insulation and cut wires on a wire bundle coming from the

down position indicator switch. Recognizing that this had been a common issue in the past, he took the initiative to inspect the left hand MLG for the same issue. He then inspected the Back-up SAR aircraft, observing the start of degradation on both aircraft (A/C). Cpl Doucet immediately co-ordinated the required repair and consequential SAR A/C swap. Thus, achieving a seamless transition without loss of mission capability.

Cpl Doucet's attention to detail, measures taken by verifying other aircraft, and the co-ordinated repair, all resulted in an uninterrupted SAR posture. This demonstrates why he is highly deserving of this *For Professionalism* Award. 🦋

## Corporal Trevor Fujiwara



Photo: Cpl. Joey Beaudin; 19 Wg Imaging

While carrying out a post flight inspection (A check) of the right hand engine on CC115465, Cpl Trevor Fujiwara noticed a hairline crack that was barely visible to the naked eye.

The crack was found on the engine housing at the compressor's 14<sup>th</sup> stage bleed air tap-off, an area that is not specified as part of the check he

was conducting. Cpl Fujiwara far exceeded the expected attention to detail and displayed incredible skill identifying a hazard that most could barely see, even when guided to its location. A Non-Destructive Testing (NDT) technician verified that the crack was double the allowable limit. The engine was subsequently removed from the aircraft due to the danger of a catastrophic failure.

Cpl Fujiwara's superior professional attitude is commendable and his performance went well above and beyond. Cpl Fujiwara's efforts significantly increased flight safety and likely prevented a serious incident. He is therefore well deserving of this *For Professionalism Award*. 🇨🇦

# For Professionalism

For commendable performance in flight safety

## Corporal Edward Shaw



Due to a separate Flight Safety occurrence, Cpl Shaw, an Flight Engineer (FE) at 413 Sqn, was conducting maintenance of a fouled hoist cable on aircraft CH149907. He discovered that the manual cable cutter would not reset, even though it is designed to do so automatically under spring pressure for continued operation. The cutter was found to bind, requiring it to be manually reset, which in turn, could have produced a potentially dangerous situation in the event of the required use during a rescue.

The component was removed, cleaned and lubricated, then reinstalled and checked serviceable. Cpl Shaw then went above and beyond by inspecting manual hoist cable cutters on other aircraft and found the same issue. He notified Sqn Flight Safety, who contacted other Cormorant units and discovered that 75% of the fleet had unserviceable manual hoist cable cutters. This led to the discovery that no inspection or maintenance cycle existed for the item.

Despite being a new FE on the Cormorant, Cpl Shaw demonstrated exceptional insight in recognizing a critical fault and immediately taking corrective action. For his initiative, thoroughness, and dedication, Cpl Shaw is most deserving of the Flight Safety For Professionalism Award. 🦅

## Master Corporal Jake Kingsberry, Corporal Xiao-Hua Huang and Corporal Charles Walker

**M**Cpl Kingsberry, with the help from Avionics System Technicians (AVS) Cpl Huang and Cpl Walker, found a metal tube hydraulic line that was installed incorrectly on a CC-177 Globemaster III aircraft.

The team was tasked to close up the Thrust Reverser (TR) doors on an engine that was nearing completion of its Home Station Check. MCpl Kingsberry moved under the open TR doors and was verifying everything, when he felt something was not right.

MCpl Kingsberry slowly released pressure from the hand pump while Cpl Huang and Cpl Walker guided the TR doors. Nearing the fully closed position, some metal-to-metal contact was heard. It was then that technicians noticed the right hand TR door actuator's coiled metal tube hydraulic line had contacted the engine's bleed air ducting and clamps, causing degradation. Upon verification, the technicians discovered that the actuator had not been serviced in over a year.

Their keen attention to detail and determination to trust their instincts potentially prevented an engine fire if it had further progressed. For their outstanding level of professionalism, MCpl Kingsberry, Cpl Huang and Cpl Walker are very deserving of the Flight Safety *For Professionalism* Award. 🇨🇦



# For Professionalism

For commendable performance in flight safety

## Master Corporal Tyson Laidler

While deployed to Guam on Exercise SEA DRAGON, a CP140 Aurora aircraft experienced multiple intermittent fire alarm indications that would clear before any follow-on actions were completed by the crew.

MCpl Tyson Laidler, an Avionics System Technician (AVS Tech), was tasked to investigate the issue and quickly realized that he didn't have the appropriate tools to complete the task. Taking the initiative, MCpl Laidler was able to source a Megohmmeter from a US supply unit and then requested approval from his home unit to use it on the Aurora aircraft.

He first conducted a detailed inspection of the ten segments of engine fire wire, finding it serviceable. He then measured every segment individually, concluding the same results. MCpl Laidler finally decided to thoroughly inspect every inch of the fire wire



in hopes of finding a visual indication of a potential short. This is when he noticed a clamp on the underside of the tail pipe that seemed slightly loose and was able to undo it with his fingers. MCpl Laidler then re-measured the segment without the top portion of the clamp attached and it measured unserviceable. The clamp was causing the segment to measure serviceable on the ground but with the vibration of flight was causing an

intermittent short airborne which was triggering the fire alarm.

This "needle-in-a-haystack" situation showed MCpl Laidler's tenacity, thoroughness and resourcefulness. His professionalism and knowledge of both the engine and fire detection system likely prevented the crew from having to conduct an emergency engine shutdown. MCpl Laidler is very deserving of this *For Professionalism Award*. 🇨🇦

## Master Corporal Robert LaPlante, 401 Sqn

On July 9 2021, while conducting maintenance on a separate aircraft, MCpl LaPlante, an Aviation Systems Technician at 401 Tactical Fighter Squadron, noticed two unrelated Flight Safeties on a separate CF 188 Hornet aircraft than the one he was working on.

When he was walking past an aircraft on his way to the one he was working on, MCpl LaPlante recognized that the left hand (L/H) aileron inboard hinge lug hat bushing was installed backwards. His profound knowledge of the system helped him in noticing the error. While taking a closer look

at the L/H aileron, he then observed that the inboard hinge fairing was cracked. After some investigating, he discovered the aircraft had flown 4 times since the last aileron replacement. If this condition had remained unnoticed, the stress on the eyelet may have caused it to crack, ultimately creating severe damage to the aileron.

MCpl LaPlante consistently applies comprehensive maintenance practices and a high level of attention to detail, which in this case prevented catastrophic failure to an aircraft component. As such, he is highly deserving of this *For Professionalism Award*. 🇨🇦



# DFS

## Commendation

The DFS Commendation recognizes outstanding professional long-term performance and dedication in the field of Flight Safety. The DFS Commendation is awarded to the following deserving individuals who, through their actions, have contributed significantly to enhance the capability of the FS Program across the DND/CAF and who emulate the values and ethos promoted by the Program.



MWO Teillet and Col Elliott, 19 Wg Comd



Capt Edwards and Col Elliott, 19 Wg Comd

# Maintenance

# IN FOCUS

# FIRE FOR EFFECT

by Capt André Lessard and Capt Gary Lacoursiere

**A**n artillery crew “indirect fire” is defined as firing on a target that cannot be directly observed. This means that the gunners are lobbing shells but cannot directly assess the results of their actions. However, their actions do have a measurable effect!

Similarly, leaders and decision makers in an aircraft maintenance organization are often physically separated from where “the rubber meets the ramp.” This remote-controlled maintenance may have some unexpected effects often not observed by the one who made the decision.

DFS recently received a story from a junior officer in a fighter squadron. This individual had little time in the job and did not originally think his actions and decisions had any direct bearing on flight safety. After all, how could he jeopardize a mission or the safety of flight while sitting behind a desk in an office on the second floor? Here is his story:

“When I was a fresh new Lieutenant at a CF188 operational squadron, a significant amount of my time was spent dealing with the infamous red folders used for flight safety reports. I helped the FS investigators by giving

my point of view on issues and pushing to end aircraft quarantines. These were almost daily occurrences in a high tempo operational squadron.

Maintenance was almost invariably affected, which meant they became part of my daily struggle as a maintenance officer. Every time something went wrong, I always thought it was a technician’s fault or a paperwork issue. I mean, how could it have been me? I never touched the aircraft... that wasn’t my job.



Photo: Cpl Bryan Carter, 4 Wg imaging



Photos: LS Erica Seymour, 4 Wg imaging

What I failed to recognize was that I was part of a greater decision-making chain:

- That aircraft that was backed up into a hydraulic stand? Probably wouldn't have occurred if I hadn't reduced the crew that day.
- Ejection carts were not installed just prior to the aircraft taking off? If only I had told the pilots more time was required between missions, as had been suggested to me.

- The paperwork that was found to be incorrect once the aircraft was airborne – possibly leading to something being missed? I was giving orders to the desk sergeant while he was completing it."

What this officer discovered is that he mattered. His decisions mattered. They affected the work of his subordinates even if it was indirectly. No one works in a vacuum. We all have direct and indirect impacts on our superiors, co-workers and subordinates. Every

decision we make has an outcome. As busy as we are, we must always consider the effects of our actions and decisions.

Are you physically removed from the results of your actions and decisions? Maybe, but that doesn't make the results any less real. Think of the gunner firing at a target 25 kilometres away shielded from the sound and fury of the blast. Always think of the blast.

**Only then can you safely  
"Fire for Effect."** 🇨🇦



# Quietus: LAST FLIGHT

BY ANNE GAFIUK

## Book review by Ken Armstrong

**M**y background as an RCAF pilot and Accident reconstructionist piqued my curiosity about this book that details crashes, pilot error, maintenance issues and military misfortunes that claimed many airmen's lives within Canada during WWII. The factual stories are quite unique because the author conducted intensive, broad spectrum research into the lives and activities of these flyers who gave their all for God and the monarchy. Anne's examination of each airman's pre war lives and their conduct throughout training until plunging to their death during wartime operations exposes their humanity, their strengths and their failures. I can't claim that I wasn't able to put this book down. In fact, there is so much emotion and sense of loss provided in the

details of the accidents and investigations that readers will feel the deep pang of lives lost and the futility of war. This is a heart felt read. Warning: parts of the RCAF accident investigators' reports are quite graphic. Anne deeply delved into archival details from many learned sources to allow us to live through these dangerous times wherein pilots and other aircrew had minimal training before pushing the limits during operational endangerment. Many died during training. In fact, 6,000 RAF airmen were lost during training in Bomber Command from 1934-1943 and 12% of the entire combative force would be killed in accidents. This book will give you a feeling of having flown during the war and is recommended for pilots from novices to high timers. ✈

*Quietus: Last Flight* is available through the author (Anne Gafiuk) [anne@whatsinastory.ca](mailto:anne@whatsinastory.ca) and the Bomber Command Museum of Canada. <https://www.bombercommandmuseum.ca/product/quietus/> \$35 + tax and shipping.

Anne offers a variety of Power Point presentations related to *Quietus*. If interested, please visit [www.whatsinastory.ca](http://www.whatsinastory.ca)

For more WWII Canadian stories, please visit [www.wwiicdnwomensproject.org](http://www.wwiicdnwomensproject.org) and [www.thetyphoonproject.org](http://www.thetyphoonproject.org)  
[www.ottawamemorialproject.org](http://www.ottawamemorialproject.org)

# LAST FLIGHT





# ON TRACK

## “Direct to” Clearances and Altitudes

This article is the next instalment of a continuous *Flight Comment* contribution from the Royal Canadian Air Force (RCAF) Instrument Check Pilot (ICP) School. With each “On Track” article, an ICP School instructor will reply to a question that the school received from students or from other aviation professionals in the RCAF. If you would like your question featured in a future “On Track” article, please contact the ICP School at: +AF\_Stds\_APF@AFStds@Winnipeg

This edition of On Track will explore and clarify Canadian Air Traffic Control’s (ATC) use of “direct routing” clearances with lower altitudes than what may be published on instrument charts.

by Capt Chris Filiatreault,  
ICP School Instructor

Over the last couple of years, the ICP School has been fielding questions from operational crews and ICP students alike concerning ATC clearances they’ve received while flying Instrument Flight Rules (IFR) in Canada. These clearances involve a “direct route” with an altitude that is lower than the minimum published altitude. In many cases this has caused confusion, often while on a Standard Terminal Arrival (STAR) and resulted in the pilot declining the clearance or altitude in favor of following

the published procedure to ensure obstacle clearance. After the flight, the crew asks themselves, “was that a legitimate clearance, and if so, why was it given?”

To give context for the reason this has developed, we have to appreciate that pandemic aside, traffic flow into major centers has grown over the last few years. As it has increased, being able to get aircraft lower and more closely sequenced has increased efficiency and thus satisfied growing service needs. However, the way ATC has accomplished this in the past (by using RADAR vectors) has become procedurally inefficient. Area Navigation (RNAV) and Required Navigation Performance (RNP) technologies have become much more robust, accurate and reliable, resulting in ATC being able to sequence traffic with extreme precision and timing. Efficiencies were found by clearing aircraft “direct to” waypoints instead of providing labor intense vectors. With this, came altitude assignments that were much lower than published altitudes (which assure obstacle clearance). These are the same as the Minimum Vectoring Altitudes (MVA) that were previously given. They also assure obstacle clearance, but without the express designation of a pilot being “on vectors”. It is possible that this has led many pilots to become apprehensive due to a lack of communication of new developments. Figure 1 is a good example of what an MVA chart looks like to an ATC controller, this one being from Brussels.



Figure 1. Brussels MVA Diagram



Figure 2. Seattle MVA Chart

In Figure 2 you will see an MVA chart that Seattle ATC uses in their operations, note how the various MVA’s follow the contour lines of the surrounding terrain. It is interesting to note that on some MVA charts, there may be adjoining sectors that have very large altitude differences that don’t seem to necessarily relate with the terrain below. This is a result of RADAR

*Continued on next page*

masking, as the terrain prevents an aircraft from being positively identified below that altitude beyond a certain terrain feature.

To see the effect of vectors vs. a “direct routing” demonstrated on video (titled: Impact of “Direct to”), NAV CANADA partnered up with Air Canada and WestJet to record a number of RNAV/RNP short films showing the various interactions between aircraft technologies/aircrew and ATC at the following link: <https://www.navcanada.ca/en/aeronautical-information/operational-guides.aspx#Videomulti>.

In August of 2017, NAV CANADA published an Aeronautical Information Circular (AIC) titled “Obstacle Clearance” in order to explain the developments pilots may be encountering. This change was then incorporated into the TC AIM, (please see AIC 19/17 in Figure 3, and TC AIM RAC, 8.6.1.). The essence of what both publications state, is once ATC gives a “direct route” they are also assuring obstacle clearance. Nonetheless, notice that they will only give you this clearance if the altitude “is at or above the minimum IFR altitude for the controlled airspace where the pilot intends to operate”. It needs to be reiterated here that this altitude could be an MVA that is not published on your charts, yet, it is still perfectly valid in controlled airspace. In the next paragraph, we see the explanation of why it is common for controllers to give the minimum vectoring altitude when issuing

NAV CANADA

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## AERONAUTICAL INFORMATION CIRCULAR 19/17

### OBSTACLE CLEARANCE

When a direct route is given, air traffic control (ATC) is responsible for obstacle clearance. Provided that the altitude is at or above the minimum instrument flight rules (IFR) altitude for the controlled airspace where the pilot intends to operate, ATC may use “direct” in a route clearance. ATC may clear aircraft that are traversing airways or air routes below the minimum en route altitude (MEA), but not below the applicable minimum IFR altitude.

Within air traffic service (ATS) surveillance coverage, it is common for controllers to issue the minimum vectoring altitude (MVA) when issuing direct routes. An MVA can be lower than a published minimum IFR altitude (minimum sector altitude [MSA], minimum obstacle clearance altitude [MOCA], MEA, or area minimum altitude [AMA]).

#### Conclusion

All ATC assigned altitudes provide obstacle clearance.

For further information, please contact:

NAV CANADA  
77 Metcalfe Street  
Ottawa ON K1P 5L6  
Attn: Claude Fortier, Manager  
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Figure 3.

direct routes to pilots. Notice that this is usually only within surveillance coverage. Finally, in all cases “All ATC-assigned altitudes provide obstacle clearance”.

To help illustrate this, please see Figure 4. This is an example to describe the above information, however, the altitudes I am using are purely fictional as I do not have the MVA chart for that area.

This is the CANUCK FIVE Arrival from Vancouver International. You have remained RADAR identified since you’ve left the enroute altitude and are descending along the STAR. You have just arrived at STAVE at 18,000 ft, and it sounds like Terminal is busy.





Figure 4. CANUCK FIVE ARRIVAL to Vancouver International

Based on what you've been hearing, you'll likely be #4 in line to land on 08L. Suddenly Terminal calls you, "CANFORCE 11, for spacing, you're cleared direct BASRA, descend and maintain 9,000 ft". Uh-oh, can this be done? Taking into account the above information, yes. ATC is desiring to either increase or decrease spacing and work on traffic flow without having to put you on vectors. Diligently, you look at your STAR page and notice that you must be at or above 10,000 ft at BASRA! Can you accept this amendment to the STAR? In a word, Yes. In this case, ATC would have an MVA that allows them to clear you down further once

you've passed a certain point, but without the chart, you won't know. Interestingly, the FAA publishes all MVA charts to help pilots double check ATC's clearances and to also help pilots avoid Controlled Flight Into Terrain (CFIT) should they suddenly find themselves in instrument conditions.

To reiterate the important point above, once ATC has cleared you "direct" to a point, they are responsible for obstacle clearance. ATC will not issue you an altitude that is below any minimum altitude, and while you are RADAR identified in a surveillance environment, it is not uncommon for them to issue the MVA altitude of the sector you are in.

I hope this article has been helpful and would like to thank all the crews for sharing their experiences that help us discuss and examine real world flying matters. ✈️



Photo: Cpl. Louis Gagné, CAF



Photo: 51 Zach Barr, CAF

# How 'Bout that Weather?

by Major Marc-Andre Asselin

In offices all over the world, the local weather is often the subject of choice at the “water cooler”. For aviation professionals, it is much more than that, the safety of the aircraft may be directly impacted by the weather report. Canada is notorious for weather extremes. Sweltering heat and violent storms in the summer, blistering cold in the winter and a Spring/Fall season that brings moisture that can quickly turn into hazardous icing conditions. So, it is no surprise that the weather is one of the top subjects in conversations on the flight line. As such, it is extremely important that the weather information gathered is both current and reliable.

As the Wing Flight Safety Officer at 17 Wing Winnipeg, I see a range of Flight Safety occurrences cross my desk. However, more recently the majority of them have one thing in common, a misunderstanding or misuse of weather information. My aim here is to clarify some of the confusion and explain some important aspects to remember when it comes to weather and aircraft safety.

With the modernisation of training programmes, weather instruction at the pre-wings stage is now being conducted by computer based training. This training provides excellent standardized metrological training,

but leaves out an instructor’s “war stories” or cautions that can only be formed from experience. Senior pilots should supervise and mentor junior aircrew on how to interpret and combine all the weather products available so that they can learn to build a big picture of the weather conditions around them. This is especially true for any localized conditions.

Many DND locations have Metrological Technician’s (Met Techs) on site. Some however do not. This on-the-ground capability monitors the local area and gives personnel (including maintenance personnel) warning of severe incoming weather. This provides crews the time to shelter the aircraft or other pertinent activity prior to weather events. For units with no duty forecasters, this job now has to be covered by

everyone. Remember that Flight Safety is everybody’s business, and that a short comment such as “the sky looks dark” reported to the SAMEO or duty personnel could save both time and resources.

We have noticed some common misunderstandings when it comes to Graphical Forecast Areas (GFA). When comparing GFAs to satellite imagery, the satellite image will usually make the GFA seem pessimistic. Remember, a satellite imagery is an instantaneous shot of current weather, or an animated display of past system movement. Whereas a GFA is a predictive product that displays information for a six hour period on a single graphic. The difference between the two products can be especially noticeable in the morning. The GFA



Figure 1. Skyvector.com

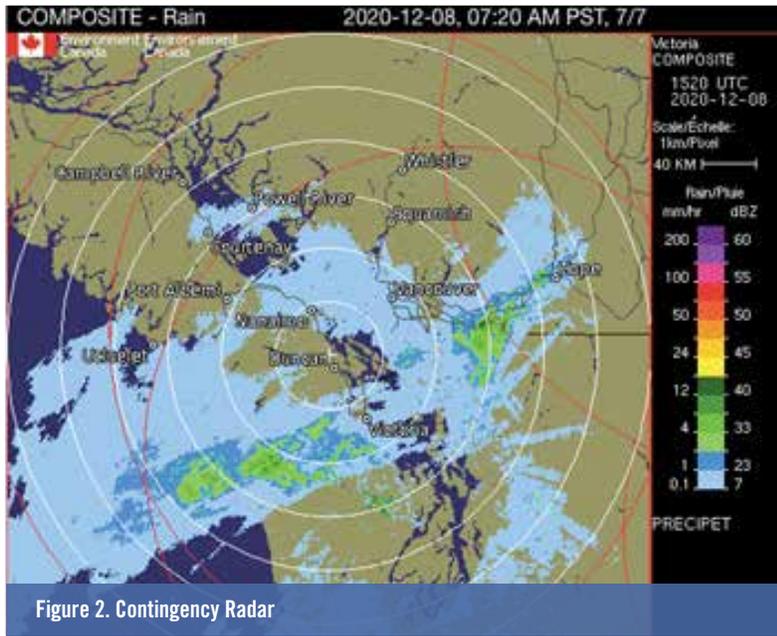


Figure 2. Contingency Radar

Canada.ca - Environment and natural resources - Weather, climate and hazards - Weather radar and satellites

### Radar outages and maintenance

Weather Office radar name	Region	Province	Reason radar unavailable	Date radar unavailable	Expected return to service
Bethune - CAGBE (near Regina)	Saskatchewan	SK	Intermittent outage due to scheduled maintenance	2021-02-13	2021-02-16
Framitown - X7T (near Ottawa)	Ontario	ON	Site under construction, Phase 1 of radar replacement.	2021-03-08	2021-03-13
Silver Star Mountain (near Vernon)	Pacific	BC	Unscheduled outage	2021-02-15	2021-02-18
Victoria	Pacific	BC	Suffered a major hardware failure, will be replaced with a new modern radar and moved to a better location providing improved coverage for the area. The new radar is tentatively planned to be operational in 2022. Until then, the radar image will be displaying data combined from seven neighbouring radar sites (including US radars).	2017-11-18	-

Figure 3. Radar Outages and Maintenance Website – Environment Canada

(being a six hour product) may show more convective activity than the satellite image. Take both products into consideration when flight planning, and understand how numerous factors can impact both the weather and the products your viewing. Another important thing to remember is to be careful with international borders! GFAs are Canadian products. If you need to fly around a weather system, remember that GFA coverage stops at the international border!

Weather radar station outages are another area of concern. They are not covered by the NOTAM system and are usually not shown when using software such as [Foreflight](#), or websites such as [Skyvector.com](#). In some cases, these gaps in coverage could be interpreted by the user as an absence of weather. For example, Figure 1 does not indicate that the radar in Victoria is off air and is currently undergoing maintenance until 2022.

If you see red circles such as the ones shown in Figure 2 from the composite radar on the Environment Canada website, they are called “Contingency Radar” and indicate the extended range of the surrounding stations. This is meant as a temporary means to offer coverage. Note that ATC may not be able to provide weather avoidance vectors in these areas. If needed, a complete picture of the radar situation in Canada is available on the Radar Outages and Maintenance website maintained by Environment Canada (Figure 3).

With technology becoming more readily available to aircrew and more websites becoming accessible as flight planning resources, it is important for users to ensure the accuracy and validity of the weather products they are using. All these products are fantastic situational awareness tools when used properly and in conjunction with trusted sources such as the CF Weather Office, Environment Canada or NavCanada websites. Remember that the CF Weather office is always available for Meteorological support and operational weather briefings via the internet address and phone number provided below. Take advantage of this capability! Met Tech’s will give the most accurate and up-to-date information.

#### CF Weather Office

<https://met.forces.gc.ca/english/>

#### Joint Met Centre – Met Support:

506-422-2613 (CSN 432-2613)

#### For an Operational Weather Briefing:

1-800-WXMETE0 (800-996-3836)

Aircrew members are encouraged to apply for their own personal login to the CFWOS website by choosing the Security and Accounts button on the top of the page and filling out the CFWOS Access Form. With this personal login, Aircrew members can then log into CFWOS outside of a DWAN connection and have full access to the products and tools. 🔥

# INTIMIDATION AND CRM

by Maj Jill Sicard, DFS 3-3

I cannot say we have all been there, but for some aircrew, bullying and intimidation in the cockpit is something that can affect us for our entire career. It has the potential to change the way we were originally taught to communicate and work together in dynamic and challenging conditions.

I have never been bullied while growing up, so when it first happened to me in flight training, I was really unsure of what was actually happening. At first, I saw it as harsh criticism and so I tried harder to please this individual. Then, over time I felt worn down and my morale had dramatically changed. I no longer voiced my opinions very often, I somehow found myself accepting the bully's behaviour. This led to me dreading the start of every work day, dreading flying (which I normally considered my passion), even dreading passing by that individual or their friends, in fear that they too might think or say something negative.

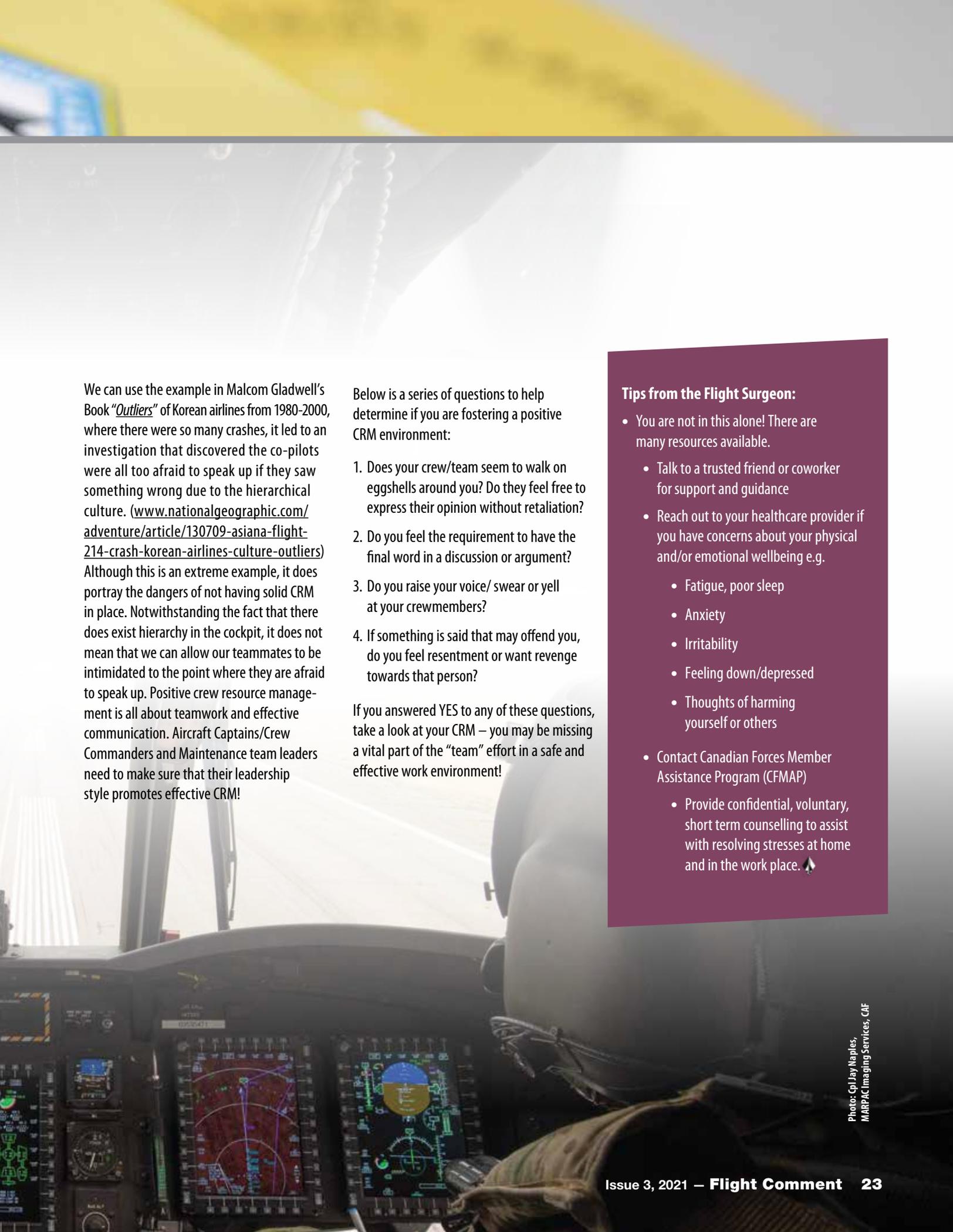
When a 'bully' (and I hesitate to use that word since there is no claim of victimhood) is good at what they do, they can make

their intimidation almost imperceptible, you honestly don't see it coming until one day, it hits you, most likely in some sort of event like a failure on annual checks or a disagreement that explodes into a yelling match in the cockpit, or maybe you just converse with friends and find out that they too have experienced similar situations. I remember when I realized it had been happening to me over a 3 year period, it hit me when it was too late, my career and more importantly, my whole 'being' felt destroyed. I could no longer sleep, I had no joy in normal activities. I finally realized I had changed when I tried to study and better myself, to "prove" something I had always felt pretty secure about before, (that I was good at my job) I found myself unable to remember simple rules that used to come second nature to me, my knowledge retention was completely erased.

This is a bad situation that can cause dangerous implications in the cockpit. You could be distracted on your walk around because you are thinking about what this person will say to you today. You could skip

a step in your start-up checklist because you are telling yourself "I just have to get through this flight", or you could be so focused on ignoring everything they are saying so you don't get upset, that you may actually miss a warning or important guidance they give you during the flight. Once you get to this point, it is hard to distinguish between someone bullying you and actually trying to teach you something, because perhaps you have shut them out completely in order to try and focus on even the most basic of flight rules. You may end up building a wall and inadvertently blocking out vital aspects of your job in order to avoid the crushing blow of intimidation.

This is why Crew Resource Management (CRM) is critical to an effective crew and successful mission. Intimidation and bullying can destroy CRM and cause dangerous outcomes that no one wants to experience. It is easy to understand that it exists, looking back at the history of rank and position of power both inside the military and civilian aviation alike.



We can use the example in Malcom Gladwell's Book "*Outliers*" of Korean airlines from 1980-2000, where there were so many crashes, it led to an investigation that discovered the co-pilots were all too afraid to speak up if they saw something wrong due to the hierarchical culture. ([www.nationalgeographic.com/adventure/article/130709-asiana-flight-214-crash-korean-airlines-culture-outliers](http://www.nationalgeographic.com/adventure/article/130709-asiana-flight-214-crash-korean-airlines-culture-outliers)) Although this is an extreme example, it does portray the dangers of not having solid CRM in place. Notwithstanding the fact that there does exist hierarchy in the cockpit, it does not mean that we can allow our teammates to be intimidated to the point where they are afraid to speak up. Positive crew resource management is all about teamwork and effective communication. Aircraft Captains/Crew Commanders and Maintenance team leaders need to make sure that their leadership style promotes effective CRM!

Below is a series of questions to help determine if you are fostering a positive CRM environment:

1. Does your crew/team seem to walk on eggshells around you? Do they feel free to express their opinion without retaliation?
2. Do you feel the requirement to have the final word in a discussion or argument?
3. Do you raise your voice/ swear or yell at your crewmembers?
4. If something is said that may offend you, do you feel resentment or want revenge towards that person?

If you answered YES to any of these questions, take a look at your CRM – you may be missing a vital part of the "team" effort in a safe and effective work environment!

### Tips from the Flight Surgeon:

- You are not in this alone! There are many resources available.
  - Talk to a trusted friend or coworker for support and guidance
  - Reach out to your healthcare provider if you have concerns about your physical and/or emotional wellbeing e.g.
    - Fatigue, poor sleep
    - Anxiety
    - Irritability
    - Feeling down/depressed
    - Thoughts of harming yourself or others
- Contact Canadian Forces Member Assistance Program (CFMAP)
  - Provide confidential, voluntary, short term counselling to assist with resolving stresses at home and in the work place. 📍

## REVENGE IS A DISH BEST SERVED COLD

by Col (Ret'd) Steve Charpentier, DFS 3

Although the origin of this proverbial saying is unclear, a quick google search will show that it could be a Shakespearean expression or possibly an expression borrowed from a similar old French proverb. For some, it means that revenge is most satisfying when things cool down after the harm has been done, for others like me, I always understood that revenge will be better served once emotions have settled and you can strategize a plan.

So why am I talking about revenge using proverbial language? It is due to the fact that I have seen over the years a very similar pattern with flight safety. I would coin a new quote that "flight safety is best served cold", clear of emotion that may cause a knee jerk

reaction, opting instead for a good analysis of the data and a clear understanding of the cause-effect relationship. Failure to do this can create unwanted collateral effects. I have collected many examples of this over the years to demonstrate my point.

### **Example 1: Helicopter Overtorque Surge.**

Following two or three episodes of helicopter overtorques, some people reacted swiftly by pointing the blame at the pilots. It was rumored amongst supervisors that this was happening to a level that was unseen before and that aircrew were not proficient or properly focused on their tasks. Some people were clearly looking for a simple answer – someone to blame. As a consequence, this resulted in a fear among pilots to report or to

be involved in the next overtorque incident. A collateral effect of this was that some pilots were now so focused on preventing an overtorque that some were reluctant to pull maximum torque when faced with a difficult "sinking" landing condition. As a result, the next problem we started to see was an increase in hard landings. On the last overtorque spike, DFS was asked to conduct an analysis of all available data. No evidence was found in relation to repetitive trends, loss of expertise or training issues. It was one of those periodic surges resulting from operations outside the routine. Furthermore, what the DFS analysis showed was that over time we are actually doing better at preventing overtorques (Figure 1).

**Key Take Away:** Strong negative reactions with an authoritative tone from supervisors and the leadership will always suggest blame and may result in a fear to report, a fear to make errors or a fear to do the necessary manoeuvre that could prevent a bigger issue. In addition, a fear to be the next “guilty” pilot hanged at the morning brief in front of their peers. Using the Flight Safety Just Culture Matrix (Figure 2) to assess accountability will best guide our personnel. Using trend analyses and a deliberate data-driven approach to find the causes of the incident spikes is more effective and will preserve trust. This enables reporting, learning and ensures an enduring and strong flight safety culture.

**Example 2: CF-18 Landing Long.**

CF-18s typically operate from long runways but can safely takeoff and land on much shorter ones. While the normal aim point is just slightly beyond the “numbers” to account for the eye-to-wheel adjustment in the Hornet, some pilots sometimes land long, especially when they have little experience and float their flare, or when outside factors come in to play (e.g. weather). On a long runway, this usually has little impact and is even acceptable. However, landing long on shorter runways poses the risk of runway overruns, especially at heavier landing weights. When a junior wingman on squadron was strongly briefed by the Operations Officer (Ops O) “not to land long” at the destination due to the short runway, he ended up landing short of the runway, creating a much more dangerous situation (runway underrun at high speed vs runway overrun at lower speed), all because he was primarily focused on not landing long.

**Key Take Away:** When in an authoritative position, avoid creating operational pressure and intimidating crews, as this may change how they would normally operate. Instead, reinforce all important considerations. If the briefer had focused on safe practices such as



Figure 1. CH-146 Overtorque/Hard Landing Rate (Rate per 10,000 Hrs)

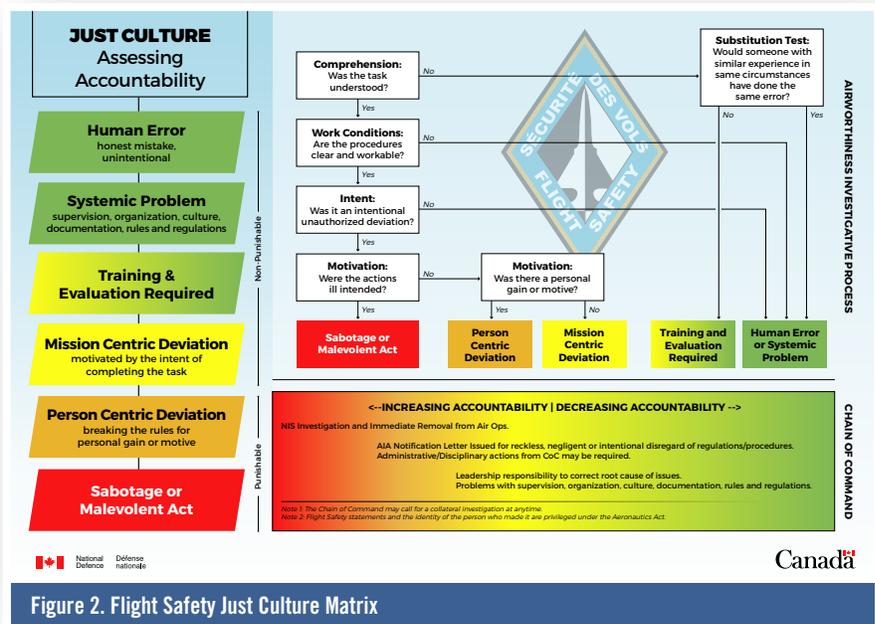


Figure 2. Flight Safety Just Culture Matrix

using a normal aim point and going around in case the aim point drifted and/or ensuring landing weight allowed sufficient runway availability, the junior pilot would likely not have had the same mindset approaching this challenging landing.

**Example 3: Air Maintenance Squadron High Incident Rate.** In this scenario, one maintenance squadron was being singled out because of their high number of reported maintenance incidents while another was publically praised for their low incident rate.

*Continued on next page*

# DOSSIER

The technicians at the first maintenance squadron had received aggressive lectures, which lead them to believe that they were not doing a good job, while the other squadron was praised for their low incident numbers. In the first case, the technicians may now be hesitant to report. Unbeknownst to them, the second squadron may not have optimized their reporting culture which leads to the illusion that they are doing a great job. I have seen cases where maintenance supervisors were negatively filtering all the flight safety reports produced by the technicians to ensure their statistics looked good.

**Key Take Away:** Competition in flight safety may lead to unwanted consequences and can be as bad as placing blame for mistakes. Instead, create an atmosphere of trust and open discussion. When faced with repetitive occurrences, take the time to examine your process and see what can be done to reinforce your organization's incident resilience. Do not focus on people, focus on the system and the process.

**Example 4: Lessons Learned for Border Crossings.** Lastly, one based on my experience. When I was flying Twin Huey's in the Sinai, we had to fly troops in a zone called the "W" (Figure 3). It was very difficult to navigate in this area near the border of Israel. We had no GPS back then, the maps were not overly precise, and we would often rely on "eye, map, ground" searching for border markers. Our leadership advised that it was far better to report any border crossings to avoid diplomatic issues with Israel. They assured us that no one would be blamed for an error in navigation. One crew came back the following week reporting a 50 ft crossing error into Israel. They stood at the morning briefing explaining their mistake and were cited as a good example of reporting in front of everyone. "All's good, Bob's your uncle!" Two days later, a second crew had a similar event.

The leadership's tone had changed, it was no longer a lesson to be learned but seemed like a punishment was imminent. A week later another one; then the "smurf" hit the fan and there was talk of pulling the aircraft captain's qualification. This reaction was very effective (insert sarcastic tone here). For the remainder of the 6 month mission there were no border crossings reported. Zero reports. All was good and the headquarters was happy. I can tell you from experience that the border crossings did still occur occasionally when we were tasked to operate in the "W", but no one would report them and it became a running joke at the bar.

All that to say: flight safety is a dish best served cold. It is always better to look and analyze the facts in a calm and deliberate fashion before reaching any knee jerk conclusions. Don't make it a competitive game of who has the best record and don't make it a finger pointing exercise. It is imperative to understand and practice the just culture. Use the Flight Safety Just Culture Matrix, work out all issues with a calm rationale, reward good deeds publically and deal with the negative compoment in private. Do not brag about it, do not shout about it, stay calm and carry on practicing flight safety. 🍷



Figure 3. The "W," Sinai Peninsula, Egypt

# LESSONS LEARNED



Photo: Sgt Matthew Zukowski, 424 Sqn

## Sled Strap Mishap

by Sgt Matthew Zukowski, 424 Sqn

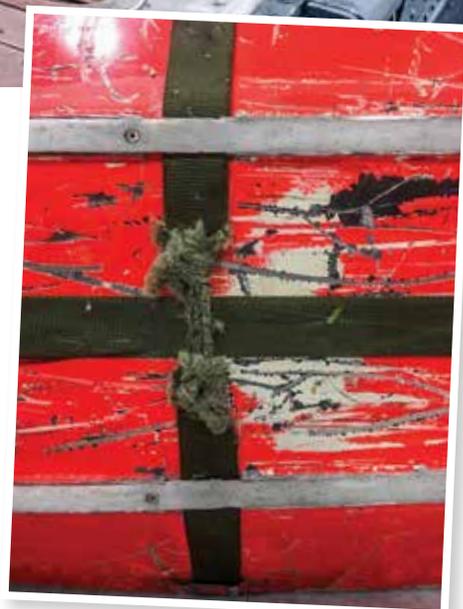
In the Search and Rescue (SAR) environment we have a 4-person operational toboggan that sits at the end of the CC-130 Hercules ramp and consists of two old infantry winter equipment sleds strapped together face to face. It is utilized by SAR Technicians (SAR Techs) on the ground in the rare case that recovery may take several days.

Thankfully, the toboggan is not required on a regular basis, in fact, I have only seen it used a couple times in my career. However, it contains a lot of equipment and more importantly, it is very heavy and is full of miscellaneous gear. It is often moved as the aircraft is reconfigured for various missions.

One such time, while moving the toboggan from the ramp to the middle of the aircraft, it got snagged on one of the spotter seats and rolled over. When I attempted to grab it and

roll it back upright, I saw the strap on the underside of the toboggan was cut 95 percent of the way through. If we had deployed it, not only would it have come completely apart when it hit the airstream, but it would have endangered anyone on the ground who would have been waiting to receive it. This fatal flaw was found due to a "happy accident". It had frayed over time as it was picked up or slid across the ramp during reconfigurations and training. Although it is inspected every day and repacked every six months, because of its size and weight, it was never turned over to inspect the bottom.

This gave us a good chance to re-evaluate our kit and we replaced the toboggans with heavy duty pelican cases. They can be moved and inspected by a single person and have built in handles to carry them. Following this situation, I reflected on the importance of a thorough



inspection (despite its inconvenience, or requirement for assistance) and how imperative it is that we do our job to completion for the sake of our crew and the safety of the personnel that we rescue. 🚒

# LESSONS LEARNED



Photo: Canadian Forces Combat Camera, DND

## It's In The Bag!

by MCpl Paul Kachur, 404 Sqn

It was another beautiful July evening on the ramp at CFB Greenwood. The flight line was full of CP 140 Aurora aircraft in various stages of operations and maintenance. I was working with the servicing team and the day turned out to be busier than expected. Aircraft 116 was on spot 44 surrounded by other aircraft undergoing maintenance. As part of the start crew, I had just finished removing the chocks and was now waiting in the line shack to observe the engines start in case of any possible ramp snags. Aircraft 116 had all four engines running smoothly and was preparing to taxi when I noticed a particularly heavy gust of wind blew an empty “parts bag” into the air. Where it originated from, I cannot be sure, but it was definitely FOD that was now soaring dangerously close to aircraft 116. I watched the parts bag dance and twirl in the sky, while it ignored engine #1 and #2, it crossed in front of

the nose and was blown upward and out of sight beside the APU exhaust.

The first words out of my mouth were; “Did that go in the engine?” “Nahhh” says the neighbouring senior tech, “Looked like the APU blew it over the aircraft, so it’s probably fine”. “Oooooo kayyy.” I reluctantly agree.

As the aircraft turns out of its parking spot, my gut feeling isn’t allowing me to accept the “It’s **probably** fine” statement. I stare with great intent at the now empty parking space, hoping to get a glimpse of the missing parts bag, to no avail. I say again to the senior technician, “I think engine #3 was compromised, I can’t see the bag on the ramp”.

“The engine is fine” is the answer I get in return.

Deciding to ignore the obvious confidence of the senior technician, I called tower and asked them to return aircraft 116 to the ramp for

potential FOD ingestion. I later learned that while I was on the phone with tower, the aircrew began smelling burning plastic.

The aircraft returned and shut down WFI. The subsequent investigation revealed that the engine intake sucked in a parts bag and portions of it went further down into the EDC air intake, where it melted and introduced fumes into the environmental system of the aircraft.

This incident taught me that when it comes to safety of flight, always trust your gut and err on the side of caution. In hindsight, had I chosen to follow the lead of the senior technician and someone got hurt due to my lack of fortitude, I would have a very hard time looking at myself in the mirror. Your gut instinct is most often the correct one. Trust it. 🛩️

## The Whole Story

by Sgt Jason Fitzgibbon, 438 THS

Sometimes, the story behind a snag is as important as fixing the snag itself.

In 2014, I was an AVN Tech with 417 Squadron when our aircrew returned with a CH-146 Griffon from contractor maintenance. They reported that the *Cyclic Center* light had illuminated and would not extinguish. During the investigation, I discovered a cut wire in a bundle installed behind the cockpit instrument panel. The wire bundle was rubbing against the support structure of the instrument panel glare shield. Wire repaired, aircraft serviceable, case closed.

Five months later, I participated in an aircraft acceptance check from the same contractor. I decided to mention the cut wire and luckily, they took the issue seriously and had me show them the bundle on another aircraft. Lo and behold, I found cut wire. Inspection of a third

aircraft found yet another wire bundle in the process of fretting; however, it was protected by a plastic coil and not yet cut.

Upon returning to my unit, I recommended to my SAMEO we conduct a Local Survey. We found some degree of fretting on this particular wire bundle on all our aircraft. While some had plastic coils installed to prevent this, the attempted fix was inadequate.

The wire bundle in question was part of a modification and had been removed and re-installed recently on the entire fleet as part of the Griffon's contracted phase maintenance. Research also revealed the use of plastic coil wrap was not authorized as a solution in this situation. I recommended the issue be raised to a fleet wide Special Inspection (SI). The SI ultimately uncovered nine aircraft had fretting wires or plastic coil wrap.

This incident highlighted for me the importance of knowing the whole story. Often, technicians do not give a second thought to a seemingly simple fix. Something brakes and we fix it. This incident started as a one-off snag: an aircraft had a broken light. If I hadn't known where the aircraft came from, it might have ended there. If I hadn't been curious and spoken up at the contractor facility or had chosen not to investigate further, many aircraft could still be flying with fretting wires.

The foundation of Flight Safety is using past incidents to prevent future problems. Know your aircraft's history and if you don't, have the willingness to investigate deeper. Take the time to follow up, because the whole story may yield results far greater than you would have thought. ✦



Photo: MCpl Brandon O'Connell, Image Tech, 3rd Cdn Div, PA

# FOOD FOR THOUGHT



Courtesy Flying Safety Jun 83 – Squadron Leader Mark A. Lewis, RAAF, Directorate of Aerospace Safety

## *Flight Comment No 5 1983*

Our squadron commander was about to retire after many years in the business of hauling trash. There were formal farewells planned, but we had decided that a few drinks with the boss was appropriate, so we gathered in the warmth and friendliness of the club. We started drinking and remembering the good times we had all shared. He had been a good leader, and our feelings of loss were quite genuine. Many happy memories were reviewed and relived. This man was a superb pilot who had taught us many things and he would be missed.

In no time at all the old club was jumping. Eventually we arrived at the point where speeches were inevitable. Executives stood around and mumbled the platitudes which are always mumbled at this sort of gathering. Then the retiring CO spoke up.

"I would like to tell you a story about one of our pilots." Immediately a dozen guilty consciences had a moment of terror as their lives and careers flashed before their eyes.

"My story begins early one Saturday morning", he continued. "Some friends had decided to flyaway for a weekend of gambling and fun at a casino. It was raining heavily as they drove to the airfield, and there was a low cloud base of solid, grey overcast. They decided to delay their departure and see how the weather developed. The passengers were happy to sit it out and put no pressure on our pilot. They were prepared to cancel rather than risk their lives in the weather. After waiting about 2 hours, the weather improved sufficiently to attempt the flight. They were airborne quickly, departing for the casino VFR.

"The first half of the flight went smoothly, then the weather started to deteriorate again. They were still VFR, which was required by the category of the pilot's civil licence and the lack of "aids" in the aircraft. He was not too concerned about losing visual reference to the ground. He was confident that his several thousand hours of military flying and hundreds of hours of instrument flying would pull him through. This encouraged him to "stretch" the VFR limits. He was determined to get to the casino.

He knew exactly where he was and where he wanted to go. The terrain ahead had some high ground, natural funnel features, river valleys, and a major rail route. He decided that he could successfully traverse this area by following the river and then the rail route. This ill-conceived plan was encouraged by the fact that the weather at destination was improving



rapidly; it was already open to VFR traffic. Even though he would not be operating according to VFR, he pressed on.

"As he flew into the deteriorating weather, he was forced lower and lower. He knew the success of his plan relied on maintaining visual contact with the ground. Eventually he was flying at approximately 50 feet above ground level with about one-quarter mile visibility, deteriorating in passing showers. The greyness of the weather seemed to promise VFR at any time, so he kept going.

"While he was struggling with weather, destination center called and asked for a weather report. He knew if he told them the truth he would be in big trouble, but he didn't want to lie. A compromise transmission should save the situation.

"He reported the weather as marginal VFR, with areas where the clouds went to ground level and main cloud base at an estimated 500 feet. He flew on for another 20 minutes

before finally breaking visual. He was very relieved". (As the story unfolded, most of the guilty consciences relaxed and began to look forward to the coming expose.) The story continued.

"As our pilot entered the circuit area and prepared to land, he felt very guilty about the lives he had risked. Just then he heard another aircraft taxi VFR for the reciprocal of his route. You could not have paid him to attempt it himself. He had given himself a good fright. He spoke to the other aircraft pilot and tried to talk him out of his flight. The answer our pilot received was that since he had just come through VFR, what was all the fuss about? He departed as our pilot landed.

"That evening, as our pilot was enjoying dinner in the casino, he overheard a discussion of a crash. It appeared that a light aircraft had crashed into the side of a mountain in poor visibility. The aircraft had been destroyed and three people had died."

By now our boss was talking to a very hushed group. Pilots do not like to hear of people dying in aircraft accidents. We're all members of a fraternity and are bonded by a love of what we do. Consequently, the loss of a member is a very sad thing.

After a pause for reflection, our mentor continued. "The pilot I have been talking about is me. I set a very poor example that day and someone followed it and died. He wasn't lucky enough to be able to recount this to you so I will do it for him.

"Whenever you fly and whatever you are flying, be conscious of the example you set. Set examples you can be proud of. This way, you will help keep others safe. You are professionals; be professional. "

I have always been impressed by this story and its message. It has affected my decisions at times in my career. I offer it to you as food for thought. ✈

# From the Investigator

**TYPE:** Boeing Chinook (CH147F306)

**LOCATION:** Wainwright, AB

**DATE:** 11 May 2021

On the day of the accident, a CH147F Chinook helicopter was conducting a series of familiarization flights with various Military personnel onboard as a wrap up to Exercise Maple Resolve. The Chinook was flying in concert with two CH146 Griffons in VMC (Visual Meteorological Conditions).

Each sortie involved landing sequences to unprepared surfaces out in the assigned training area. On the third sortie of the mission, with 12 passengers and 5 crew onboard, the Chinook attempted a landing to a selected spot in a grassy field. Very shortly after touch down, due to concerning perceptions of drift, the Flight

Engineer (FE) called for the pilot to abort the landing with the command "Up, Up, Up." The pilot flying (PF) aborted the landing and started to climb the aircraft into a hover. The aircraft entered into an unstable flight regime shortly after with strong lateral oscillations causing the PF to initiate an emergency landing. Upon touch down, the FE called for an emergency egress whilst the PF initiated an emergency shutdown of the aircraft. Two of the front rotor blades made contact with the fuselage and the rear landing gear collapsed.

The aircraft sustained very serious damage. Of the personnel onboard, 3 reported minor injuries following the accident.

The investigation is focusing on material and human factors. 4



# Epilogue

**TYPE:** CH148 *Cyclone*  
(CH148805)

**LOCATION:** Shearwater, NS

**DATE:** 30 November 2020

The CH148 *Cyclone* is being manufactured by Sikorsky International Operations Inc., a Lockheed Martin Company, at multiple locations. Final assembly of each airframe is carried out in the Coatesville (PA) facility. Aircraft CH148805 was the 23<sup>rd</sup> of 28 CH148s to be delivered to Canada.

On 23 November 2020, aircraft CH148805 left the production plant in Coatesville (PA) and arrived in Shearwater (NS) on the morning of 24 November 20. The initial acceptance check inspection was initiated as per the Fleet Work Instructions. An avionics technician inspected the No. 1 Alternating Current (AC) Power Distribution Unit (PDU), and terminal

wire lugs T1, T2 and T3 were found unsecured. T1 was missing its securing nut, lock washer and flat washer but was still contacting its terminal stud. Terminals T2 and T3 were found hand tight. A Foreign Object Damage (FOD) check was carried out and all missing hardware for T1 lug was located at the bottom of the No. 1 AC PDU cover assembly.

There was neither injury nor damage resulting from this occurrence.

The investigation found that poor visibility of, and difficult access to the connections, as a result of the two-tier system of the PDU, combined with improper terminal position and fitment of stiff wires likely led to false torque condition. The preventive measures recommend a publication amendment, and a design change to prevent the nuts at the terminal connections from backing off when subjected to vibrations. ⚡



Photo: Cpl Stefan Bielecki



Photo: MCpl Sean Fanning

# Epilogue

**TYPE:** Cyclone CH148822  
**LOCATION:** Ionian Sea  
77 NM West of Greece  
**DATE:** 29 April 2020

On 29 April 2020, the crew was tasked as part of Operation REASSURANCE to conduct a routine surface surveillance mission in the Ionian Sea followed by flight deck evolutions for aircrew proficiency upon recovery to Her Majesty's Canadian Ship (HMCS) Fredericton. There were four members of the crew and two passengers on board the aircraft.

During the return for recovery, the aircraft made a pass on the port side of the ship, from stern to bow. The aircraft then executed a left hand turn to establish a downwind leg in preparation for approach to the ship.

Astern and inside the control zone of the ship, the aircraft commenced a final left turn to set-up for the approach. During this final complex manoeuvring turn to close with the ship, the aircraft did not respond as the crew would have anticipated. This event occurred at a low altitude and became unrecoverable. The aircraft entered a high energy descent and impacted the water astern the ship. The aircraft was destroyed and all six occupants were fatally injured.

The investigation determined that the aircraft electronic flight control system was designed and certified in accordance with applicable specifications but contained a fly-by-wire flight control law that created a Command

Model Attitude Bias Phenomenon – an aircraft objectionable behaviour characteristic – that resulted in the pilots' inability to effect a restorative pitch correction, while overriding the engaged airspeed/pitch axis flight director mode at low attitude.

The aircraft fly-by-wire control laws, when coupled to the indicated airspeed pitch axis mode of the flight director in a multi-axes manual flight manoeuvre with excessive manual input to the pedals, induced a negative pitch attitude bias resulting in insufficient aft cyclic controller command response to recover the aircraft without deselection of the flight director mode.

The primary flight controls were manipulated to override the engaged airspeed/pitch flight director modes during the final manoeuvre without verbalization to the crew nor was it challenged by the crew, as a result of ineffective crew resource management. The absence of standardized crew resource management was also observed during other phases of the mission.

The original equipment manufacturer, Airworthiness Authorities and aircraft operators were unaware of the Command Model Attitude Bias Phenomenon prior to the accident.

The investigation concluded that CH148 publications contained information that may have been confusing or misleading to operators, contained numerous sections on automation considerations that were incomplete, and lacked manoeuvre descriptions that would have been required for operational use.

The investigation recommends amendments to CH148 publications regarding automation operating intent, automation philosophies, and automation employment strategies. The investigation also recommends modification to software embedded within the electronic flight control laws and to enhance flight mode annunciation and awareness to the crew.

The investigation recommends that a working group be established to review the Maritime Helicopter Project Statement of Operating Intent, and to determine the operational requirement of the return-to-target, and similar manoeuvres, in the CH148. 🚩



# BE ON THE LOOKOUT FOR THIS GUY



The Math checks out,  
I should make it through!

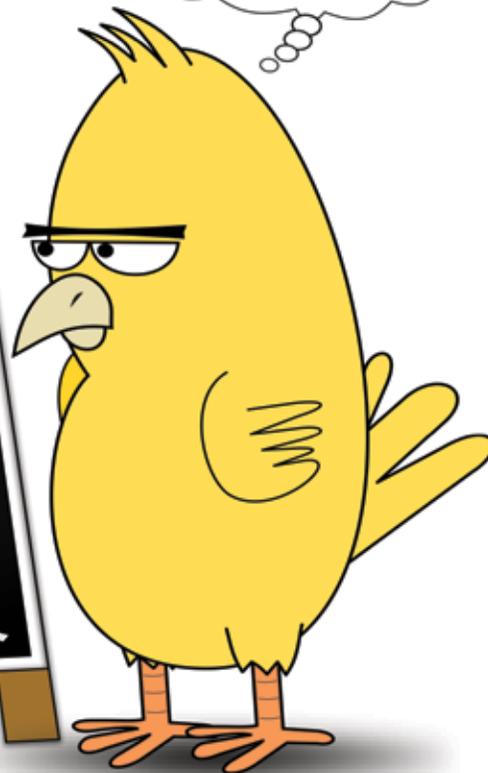
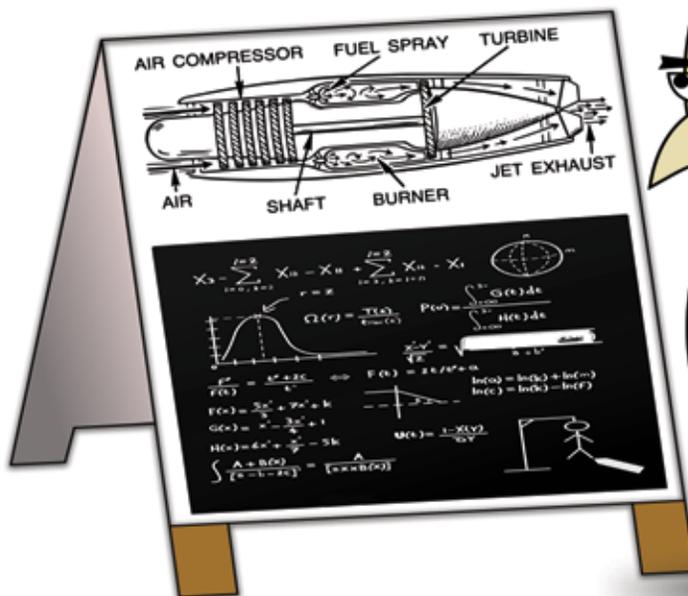


Photo: Cp 1 Kyle Morris