



National
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Flight Comment



ISSUE 2, 2022

**SPECIAL SERIES:
NECK AND BACK PAIN**

ON TRACK

ADS-B Update

LESSONS LEARNED

More than a Nuisance

Canada



Neck and back pain 6



RCAF Strikes Back 19



Safety and Effectiveness 22



Unknown Targets 26



More than a Nuisance 28



Document Review 30

Photo: cpl Kyle Morris



TABLE OF CONTENTS

Issue 2, 2022

Regular Columns

Views on Flight Safety	2
The Editor's Corner	3
Special series on neck and back pain – Helmet Fit	6
On Track	
ADS-B	10
Dossiers	
Is Your Picture Worth a Thousand Words?	16
RCAF Strikes Back	19
Safety and Effectiveness through Wellness	22
Lessons Learned	
Don't Identify Unknown Targets	26
More than a Nuisance	28
Document Review	30
DFS Commendation	29
From the Investigator	32
The Back Page	34

Awards

Corporal Robert Blanchard	5
Petty Officer Second Class Matt Carroll	8
Sergeant Vincent CBenoit	9
Master Corporal Kevin Kelly	14
Corporal Jason Pauley and Aviator (T) Braden Larose	15
Master Corporal Christian Michaud	18
Sergeant Steeve Rondeau	21
Master Corporal Robert Sherwood	25
Corporal Ryan Shea	27

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Flight Comment magazines and flight safety posters are available on the flightcomment.ca website.





Views on Flight Safety

by Col (Retd) Steve Charpentier, MSC, CD
DFS3 Prevention

Some may remember back in the '80s when DFS used to publish a summary of category "A" accidents once a year in the Flight Comment magazine to highlight the number of accidental losses of airframe and fatalities. The high number of accidents at the time justified the need to publish a summary once a year. Fortunately for us, the new millennium brought a much-reduced accident rate. In fact, since the year 2000, we hover annually in between zero reported accidents to a maximum of two catastrophic accidents. The worst accident in the last 22 years was the Cyclone event in 2020 that took the life of six of our friends and dedicated CAF members.

So why is it that some years we have zero accidents and some other years we have one or two accidents? What are the conditions that permitted us to have zero accidents and what are the issues that resulted in one or two accidents? Can we control those issues? What do we know about them? Can we predict them? If for example, we were able to have zero accidents in 2015 and 2018 then why did we get two in 2020 and again zero in 2021? Some of us may believe it is all fate and destiny. They may also believe there is nothing we can do about it, one day or another the statistics will catch up to us and we will get an inevitable accident. As the saying goes "It is the cost of doing business" in aviation, but I don't agree. If we were able to go from five to ten accidents per year in the '80s down to one or two accidents per year after 2000, perhaps with greater awareness, improved practices and other innovative thinking we can reach... and sustain pretty close to zero accidents.



Photo: M/Cpl Roy MacLellan

Are accidents really doomed to happen or are they the consequence of repetitive mistakes, lack of training and forgotten lessons learned? It is my opinion that unlike the Viking Sagas of recorded old beliefs, our fate and destiny is not written on the Yggdrasil tree controlled by the Old Norse goddesses Norns.¹ We are indeed responsible for our destiny. The reoccurring theme in all catastrophes is that they always involve human actions. Always!

The poster included in this current edition sums up both the accidental losses and fatalities over the last 22 years and provide a broad graphical compilation of all the cause factors identified. The RCAF lost 44 aircraft since 2000 and 24 people were fatally injured as a result. One fatality is too many when the accident was preventable and to various degrees of difficulties, they were almost all preventable.

Further broad analysis of category "A" accidents revealed that 12 Air Cadet aircraft and gliders were destroyed, two SAR Tech perished on mission/parachute training and one paratrooper died jumping out of a Hercules on a NATO exercise. The RCAF had 12 helicopters destroyed and 20 fixed-wing aircraft crashes. Those accidents were the result of 13 pilot errors, including at least 4 during ab initio student training and five accidents clearly caused by pilot disorientation. Two fixed-wing accidents and one fatality was caused by bird strikes and the resulting engine failure that followed. Engine failures, systems failures and other types of material component failures were the primary cause of 12 aircraft losses and resulting in a significant number of fatalities.

Continued on page 4

The Editor's Corner

by Maj Jill Sicard, DFS 3-3

Have you ever scrolled through blooper reels or any of the “behind the scenes” documentaries and thought to yourself, this is WAY more interesting than the actual show! You get to see how they were able to create a final product or how the characters interact. You get to delve into the lives of these people and see all the funny and sad moments—making you feel as if you’re actually part of that specific show. It almost makes you more invested for the long haul and thus the reason why you’re committed to it and binge-watch the entire collection of seasons!

The following few issues of *Flight Comment* are going to focus a bit more on the background events that happen. Of course, pilot stories and important maintenance tips are key to accident prevention, but the Flight Safety Program (FSP) pertains to the entire aviation community, ATC, QETE, health and fitness, imaging, ALSE and so much more. Everyone supporting flying ops has a role to play in accident prevention. As such, we want to introduce the reader to other important aspects of flight safety. They may not get all the star-studded attention but are just as essential when it comes to the investment of making the FSP what it is today.

Mr. Steve Charpentier, our resident SME on FS included a study of all the category “A” accidents in the last twenty years in the RCAF. The poster for this issue reflects the information provided and you can find greater detail on each accident on the Flight Safety Website. In my opinion, definitely worth a read and will maybe get you thinking about the circumstances that could cause these trends. He follows up this research with his Views on Flight Safety and the debatable question, “can we prevent all accidents?” I will let the reader be the judge of that ;)

For our first “behind the scenes” issue, the *Dossier* articles that I have included are on mental health and wellness, which is such an important aspect of aviation that often gets overlooked. This article made me reminisce about flight training while also reminding me about the importance of living a balanced lifestyle! A piece on the bird strike uptake since Covid and how our bases manage birds and wildlife in order to help keep our planes and people safe. As well as an instructional essay from our imaging specialist, Cpl Kyle Morris on the importance of photo taking when it comes to Flight Safety investigations.

We’re also including in the next four magazines, articles on neck and back pain so if you’re interested, please check back for follow-on reports! The first instalment of neck and back pain is about the importance of helmet fit. Something I can relate to, having had such a difficult time trying to get a proper fit helmet for the first year of my career. A great read for anyone who maybe has underlying pain issues and are not aware of the cause.

We have a great updated *On Track* article on the new ADS-B upgrade, another great tool we use for Flight Safety that has already been initiated in Canada.

We have Good Show, For Professionalism and DFS Commendation awards for some highly deserving members throughout the issue and a fun “find the hidden FOD” challenge on the back page. Hope you enjoy the read and as always feel free to contact us about something you want to see or share at the address on the first page.



The RCAF has lost one of our most modest heroes. Former 19 Wing Commander and Second World War fighter pilot ace James Francis “Stocky” Edwards passed away on Saturday, May 14 at 100 years old. Stocky joined the RCAF in 1940 when he was 19 years old. Flying a P-40 Kittyhawk, he flew 373 operational sorties and was never shot down himself. He was Canada’s top fighter pilot of the Western Desert Campaign and was awarded the Distinguished Flying Cross and the Distinguished Flying Medal. He was also made a Member of the Order of Canada in 2004. Stocky served in the RCAF until 1971 and led 430 Squadron during the Cold War. Our condolences to Toni and the Edwards family.

For more information about Stocky's contributions to Canada:

<https://www.canada.ca/en/department-national-defence/maple-leaf/rcaf/2021/07/wwii-flying-ace-a-valued-part-of-rcaf-and-canadian-history> 🍁

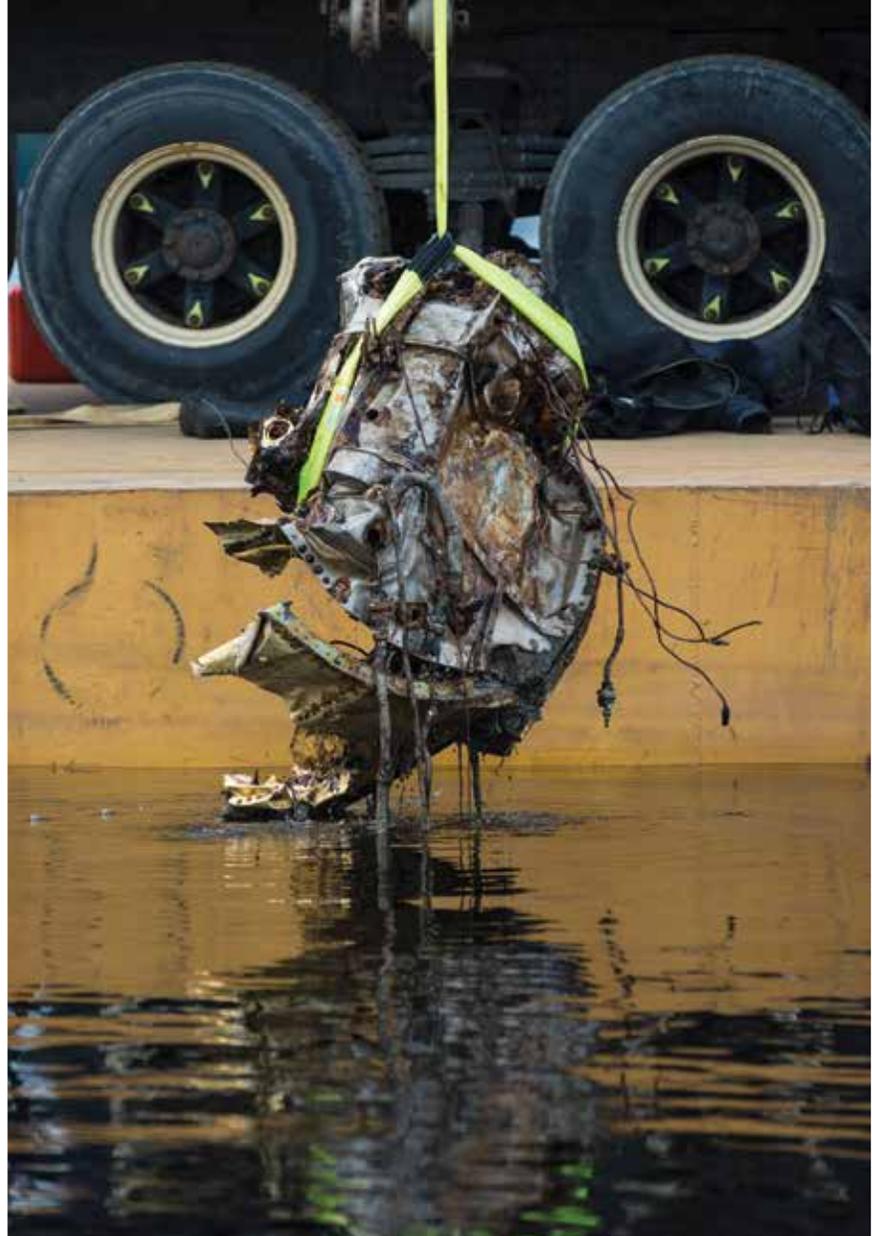
Photo: Cpl Eric Greico

Views on Flight Safety *Continued*

When we look deeper at the primary cause factors and latent conditions of all those accidents, what do we see? Decision, Technique, Communication, Pressure, Fatigue, Attention to detail and so on... one fact remains: human factors are omnipresent in all accidents. Human factors, or as we used to say human errors or mistakes, are our biggest problem. Christopher A. Hart, a previous acting Chair at NTSB discussed the fact that human factors are involved in 100% of accidents, whether it is pilot error, maintenance error, management error, or system error based on engineering defects. It still involves human factors and human errors! But hey, there are also issues related to component failure, right? True, but aircraft components fail because of what? Under design; incorrect manufacture; improper installation; improper maintenance; inadequate inspection; improper operation and the resultant overstress. It is still all human factor and error!

That being said and, let's say accepted as true, it would be **extremely wrong** to focus solely on the poor individual. The human making the error is often the result of the organization's failure. To fully understand the root cause of all those factors and errors and to prevent any future repeats, one must look deeply into the influence of supervision, the working conditions, training, standard and currency, safety culture and the organizational pressure.

As such, my point here again and again is that almost all accidents are somewhat the consequences of human factors, errors and organizational failures, they are largely the same well-known mistakes made by different people in different organizations. Thus, my premise being that if almost all accidents involve human factors/errors, almost all accidents should be preventable, and therefore sustaining pretty close to zero accident is achievable. Random bird strikes may be the exception to this.



First, in order to prevent an accident, you need to be convinced that you can prevent all accidents. There is no place for ambiguities here! To think that some accidents are inevitable is somehow unconsciously inviting them to happen. If you are convinced you can prevent all accidents, you are inviting success and you have a better chance to succeed. For that reason, you also need to own the flight safety culture and be liable for all your actions and the actions of others. You also need to agree that accidents are not random statistics controlled by fate and destiny, they are the direct consequence of our individual and collective actions, choices and decisions.

If interested in reading more about the last twenty-two years of RCAF accidental losses and fatalities, I have posted on the DFS website a compilation of all the epilogues of those accidents. They are available on the DFS DWAN website on the main page. Are you now convinced we can prevent all accidents? As always, your comments are most welcome at dfs.dsv@forces.gc.ca.

Reference

1. <https://en.wikipedia.org/wiki/Norns>

Good Show

For Excellence in Flight Safety

Corporal Robert Blanchard

On November 26, 2021, Cpl Robert Blanchard was conducting a repair of an aft flotation cylinder support within the tail section of aircraft CH148824. There is no requirement in the CH148 Maintenance Program to inspect the frame members and support structure which was forward of the area he was working in. However, Cpl Robert Blanchard took it upon himself to enter the confined area with limited access and minimal visibility.

Despite such challenges, he discovered a significant amount of metal fatigue cracking in eight locations and, knowing the critical structural integrity of the aircraft's tail section, he immediately notified his supervisors of these findings. Cpl Blanchard's findings and decisive action triggered a fleet-wide Special Inspection, which revealed that nearly all 19 aircraft in the fleet, including two that were currently on deployment, had similar damage resulting in a fleet-wide operational pause. Upon receipt of an approved repair, Cpl Blanchard worked tirelessly to ensure the Cyclone returned to service in support of British Columbia flood relief efforts during OP LENTUS.

Ultimately, if not for Cpl Blanchard's initiative, experience and professionalism as an Aircraft Structures Technician, his critical discovery would have otherwise progressed undetected and would have undoubtedly compromised the safety of the fleet and its crew. His swift actions and early discovery also reduced the likelihood of significant future impacts to CH148 operational capabilities, both at home and abroad. Cpl Blanchard's professionalism exemplifies the spirit of the Flight Safety program and the reason he is most deserving of the Flight Safety *Good Show* Award. 🇨🇦



Photo: Capt Marty Damianoff



SPECIAL SERIES on neck and back pain

HELMET FIT

by Sgt Patricia Coulas

Neck and back pain continue to be a hazard to RCAF aircrew despite many years of effort to mitigate the risk. *The Back Pain Mitigating Solutions Implementation Working Group (WG)* was established with the scope to coordinate the implementation of neck and back pain mitigating solutions across the RCAF. While the initial efforts focus on rotary wing, it is intended for the work to eventually include both fixed and rotary wing platforms and all RCAF personnel who fly with them including pilots, flight engineers, load masters, gunners, aeromedical personnel etc. The WG is multidisciplinary including operators, defence scientists, regulators, and medical experts. Regular members include DAR, DTAES, DFS, D Air Pers Strat, A4 Flt Rdns, Div Surgeon, 2 CAD AF Trg, DMedPol, DRDC, NRC.

The WG has several initiatives underway and the first article of the series that involves possible mitigation based on the scientific and engineering efforts concerning neck and back pain is the importance of helmet fitting.

Throughout history it has been generally accepted that our heads require protection. Ancient civilizations used cloth to protect the head in battle and as weaponry advanced, so did the helmets used to safeguard the skull. Early combat helmets were made from ivory, bronze, and leather in a variety of configurations. Ironically, civilizations as early as the 15th century were able to recognize the vulnerability of the head but our initial forage into the skies didn't include head protection.



Early pilots adopted the use of caps to provide protection from the cold and the elements during flight, though these didn't provide a defence against blunt force trauma. In 1908, Thomas Selfridge, had the dubious honour of becoming the first fatality in a powered aircraft. Reports indicate the US Army officer wasn't wearing head protection and perished due to his head injuries. There is speculation that Lt Selfridge may have survived the impact if he had been wearing a helmet. His death resulted in the US military dictating the use of leather helmets while in flight. By the start of the war in 1914, aircraft improved, and pilots were in enclosed cockpits. This introduced additional injury potential from the structure of the aircraft itself. The war brought to the

forefront the necessity for access to oxygen, communications and hearing protection, so the helmet advanced to serve as a mounting platform to ensure pilot access to these requirements. Prior to 1948, accessories were integrated into cloth and leather helmets. The first hard shell military aviation helmet was provided to the US Air Force by General Textile Mills in 1948. In 1958, this company shortened its name to Gentex and so began the close business relationship between the helmet pioneer and the RCAF.

Today, we know a properly fitted helmet is a life-saving device that incorporates the tools necessary for flight crew to carry out assigned tasks. The modern flight helmet provides

impact protection, night vision, hearing attenuation and clear communications. In order to function as designed, the helmet must be accurately sized and fitted to the user. The fit of the helmet influences the level of protection and safety. A helmet fit that introduces gaps around the skull can't absorb or redirect impact forces and can introduce additional injury upon impact. Incorrect size or fit will introduce additional physical and psychological stress on aircrew members during regular flight. Using the helmet as a mounting platform increases the weight and alters its centre of gravity, increasing the loads on the neck and back muscles. A properly sized and fitted helmet won't completely eradicate the problem, but it will reduce the stresses subjected on the body.

An effective helmet fitting begins with the sizing procedure. To obtain a proper fitting, it's vital to use the correct size helmet. A helmet that is too big will increase neck strain and not provide adequate impact protection. Too small, and the helmet becomes painful and distracting. The fit of the helmet results from the interaction between the life support technician and the end user. Adjustments are

made to the equipment by the technician based on the feedback provided by the user, so it's imperative that aircrew be aware of how their helmet should feel.

What does a Proper Helmet Fit Look Like?

A helmet should feel snug around the head, almost as an extension of the skin. Severe discomfort is indicative of an incorrect size or an improper fitting and needs to be communicated to the Aviation Life Support Equipment (ALSE) technician. Ultimately, a feeling of tightness is acceptable but if you feel the helmet must be removed to stop the pain, that situation must be relayed immediately to your technician. If a pressure point can be identified in the first 15 minutes of wearing the helmet, it's likely to become extremely painful during a 3-hour flight. This discomfort can lead to external compression headaches that normally dissipate approximately an hour after helmet removal.

Once the helmet is placed on the head and the chin strap is secured, you shouldn't be able to lift the helmet whatsoever. When the head is moved from side to side, the skin should move with the helmet. The helmet will be snug but shouldn't cause red marks or indentations

on your head. These marks and associated pressure-induced medical effects will continue to be experienced. This indicates that further fitting procedures are required. Test your fit by installing your night-vision goggles. Your helmet shouldn't slide forward or down with the additional weight installed. Ensure your ears are centred in the ear cup to avoid pinching of the skin and allow for adequate hearing protection. During your fitting appointment if the ear cups are providing an adequate seal around the ear, it should be difficult to hear anything around you. An aircraft is significantly louder than an ALSE shop so if you can clearly hear the voices around you, the protection isn't sufficient. Your technician can adjust your ear cups and amend the seal around your ears. Lower your visors to ensure your face or nose don't touch and the helmet is centred on your head. Unequal gaps around the nose can distract the eyes during flight.

Helmet Fit Problems? See your ALSE Tech!

There is a certain amount of trial and error involved in fitting a helmet. What is comfortable or secure in a test environment may not be so when used in an operational environment. The relationship and communication between the aircrew member and the ALSE technician continues to be vital during the use of the survival equipment. If at any time the helmet no longer feels comfortable or secure, see your life support technician for further adjustment. In extreme or difficult cases, your ALSE section can recommend specialized fittings be carried out at the Canadian Forces Environmental Medicine Establishment (CFEME) in Toronto, but ultimately, your ALSE technician is your best resource for your safety. 📌



For Professionalism

For commendable performance in flight safety

Petty Officer Second Class Matt Carroll

While deployed on Operation Reassurance, PO2 Carroll was the ship Flying Coordinator (FLYCO), onboard HMCS Fredericton and revealed shortcomings WRT proper direction and equipment for fighting composite material fires, since the adoption of the CH148 Cyclone. PO2 Carroll took it upon himself to create and implement new SOPs and organize the procurement of firefighting equipment.

The critical skills gained because of these actions were called upon after the tragic crash of Stalker 822. Before the salvage began, PO2 Carroll prepared a salvage area with protective equipment, carbon fibre fixant, and area protection. If it hadn't been for the action of PO2 Carroll to initiate the employment of composite material firefighting procedures, and prompt action during the accident, the recovery crew's safety would have been compromised.

PO2 Carroll is an example of Flight Safety leadership in the Royal Canadian Navy and the CAF. Undoubtedly, his competence exceeds the standard and his contribution has significantly increased the safety of air operations on board HMCS Fredericton, making him most deserving of this *For Professionalism* Award. 🇨🇦



Photo: Cpl Simon Arcand

Good Show

For Excellence in Flight Safety

Sergeant Vincent CBenoit



During a night SAR training mission on 28 Oct 2021, Sgt CBenoit was the Team Leader training two other SAR Techs. The exercise involved static line para jumps to a vessel on Lake Winnipeg from an altitude of 3,000' Above water level.

While observing the other two members getting ready to hook up for the jump, in low-light conditions, Sgt CBenoit noticed that the parachute worn by the acting Team Leader had malfunctioned. The reserve static line (RSL) attachment on the right side had broken free. When that SAR Tech exited the

aircraft, the right-side risers would have immediately cut away and the reserve chute would have deployed un-commanded.

Sgt CBenoit took swift action and controlled the situation and stopped the exercise, preventing a major incident. The challenges of identifying the source of a parachute malfunction under a partial canopy at night with limited lighting could easily have resulted in severe injury or loss of life. For his quick response and professionalism, Sgt CBenoit is most deserving of this Flight Safety *Good Show* Award. 🧯

ON TRACK ADS-B

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 enhance and refresh some questions and timelines about ADS-B implementation in Canada; an initiative that will improve the safety and effectiveness of aviation worldwide. The current author would like to acknowledge and thank the previous original author of this article, Major Diana Dillard, from Issue 2, 2019. Special thanks to Major Dominic Paquette (DICP), and ICP instructor Captain Iain Cummings for subject matter advice.

by Capt Chris Filiatreault

The COVID pandemic has delayed many projects and system implementations across the globe. Not surprisingly, the employment of Canada’s ADS-B plan has also been impacted. This article will serve to discuss current ADS-B timelines and requirements, as well as refresh us on ADS-B technology.

So, what is ADS-B?

ADS-B, or Automatic Dependent Surveillance—Broadcast, is a surveillance tool used by Air Traffic Services (ATS) which permits radar-like services in areas lacking traditional ground-based Surveillance Radar. By using the aircraft’s onboard avionics, combined with satellites and/or ground infrastructure, a whole range of aircraft parameters such as position, altitude, identification and speed can be relayed to ATC via the aircraft’s onboard Mode S transponder. This can be achieved via ground stations, which the United States uses, or through satellites, which Canada will use. Please see Picture 1 for an example of the Canadian system.

Breaking down the acronym, ADS-B stands for:

- Automatic: Requires no pilot input nor external interrogation;
- Dependent: Depends on position and velocity data from the aircraft’s navigation system;
- Surveillance: Provides a method of determining 3-dimensional aircraft (or vehicles and other assets) position, altitude, velocity and other data to facilities equipped to receive it;
- Broadcast: Information is continuously transmitted.

Broadly speaking there are two different types of ADS-B that can be found on an aircraft. ADS-B Out and ADS-B In. ADS-B

Out is a transmit-only mode for aircraft, while aircraft with ADS-B In can receive transmissions from ground stations, satellites and other aircraft. ADS-B Out is becoming a mandatory requirement in many different areas of the world, to include the United States, Europe, and starting in February 2023, Canada. ADS-B In provides additional situational awareness to both ATC and pilots, and aids aircraft in identification and self-separation, but is not forecasted to become mandatory anytime soon.

Why use ADS-B?

Cost effective, small footprint, high reliability and fidelity are just a few reasons why many nations are changing to an ADS-B requirement. Coupled with the fact that ADS-B In also allows weather, NOTAMs, ATIS and similar information to be broadcast (regionally dependent) to aircrew, you can see the multitude of benefits offered other than just collision avoidance and real-time flight tracking. Through satellite or ground stations, we can have almost instantaneous flight information in the most distant areas—a capability we cannot achieve with current RADAR systems in Canada. Furthermore, in conjunction with the Global Navigation Satellite System (GNSS), by using ADS-B we can remove ground-based navigation systems and therefore save economic and environmental resources. Another excellent capability of modern ADS-B systems, many of which are compatible across countries, is that ATC can



Picture 1. Aireon ADS-B system (image taken from avweb.com)

reduce minimum separation distances between aircraft, allowing for more efficient routing and sequencing, increasing overall system efficiency!

ADS-B in Canada

Aireon (a partnership between Nav Canada and Iridium) is the company which will be providing the ADS-B service in Canada. A network of 66 satellites receives the ADS-B messages from properly equipped aircraft, and position updates are computed by Nav Canada computers within two to four seconds of the ADS-B broadcast from the aircraft. As ADS-B is implemented across Canada, we might see a commensurate change in airspace boundaries as improved capacities and efficiency will be found.

To suitably equip an aircraft in Canada, an antenna that will be able to broadcast towards the ground and satellites must be installed on the aircraft. This can be achieved by two separate antennae or by one that can broadcast in both directions. Most ADS-B antennae broadcast at 1,090 MHz, although sometimes 978 MHz is used as well (such as in the USA). Aircraft that are suitably equipped for the Canadian performance mandate will also be appropriately equipped to fly in the USA and Europe.

In 2019, Canada, in partnership with the United Kingdom, were the first to implement space-based ADS-B for the North Atlantic Track System (NATS). Since then, Canada has started ADS-B performance

trials in airspace below 29,000 ft in the Montréal and Edmonton Flight Region in December 2021 and early 2022 respectively. These trials will be used to address any issues with Canadian ADS-B performance prior to mandates going into effect. Currently, Nav Canada has two phases/deadlines. First, high altitude Class A and B airspace will come into effect on February 23, 2023. The second phase, to include Classes C, D and E airspace, will come into effect no earlier than 2026. They further clarify that the approach and timing for the Class C, D and E implementation will be further defined as more assessment is done. When the Canadian

Continued on next page

ADS-B mandate goes into effect, exemption may only be granted to state, search and rescue, MEDEVAC and police aircraft, all other aircraft will be denied entry into that airspace once the mandate is in effect. Please see Picture 2 for Canada's ADS-B mandate. The RCAF is currently investigating the mechanism through which waivers will be processed for non-ADS-B equipped aircraft to operate in ADS-B Out designated airspace in Canada beyond February 23, 2023. Further information will be promulgated to units as it is received.

Other Countries Mandates

Various countries have issued mandates for ADS-B compliance in the coming years. Most mandates are scaled so that all owners and operators have time to purchase and install the required systems.

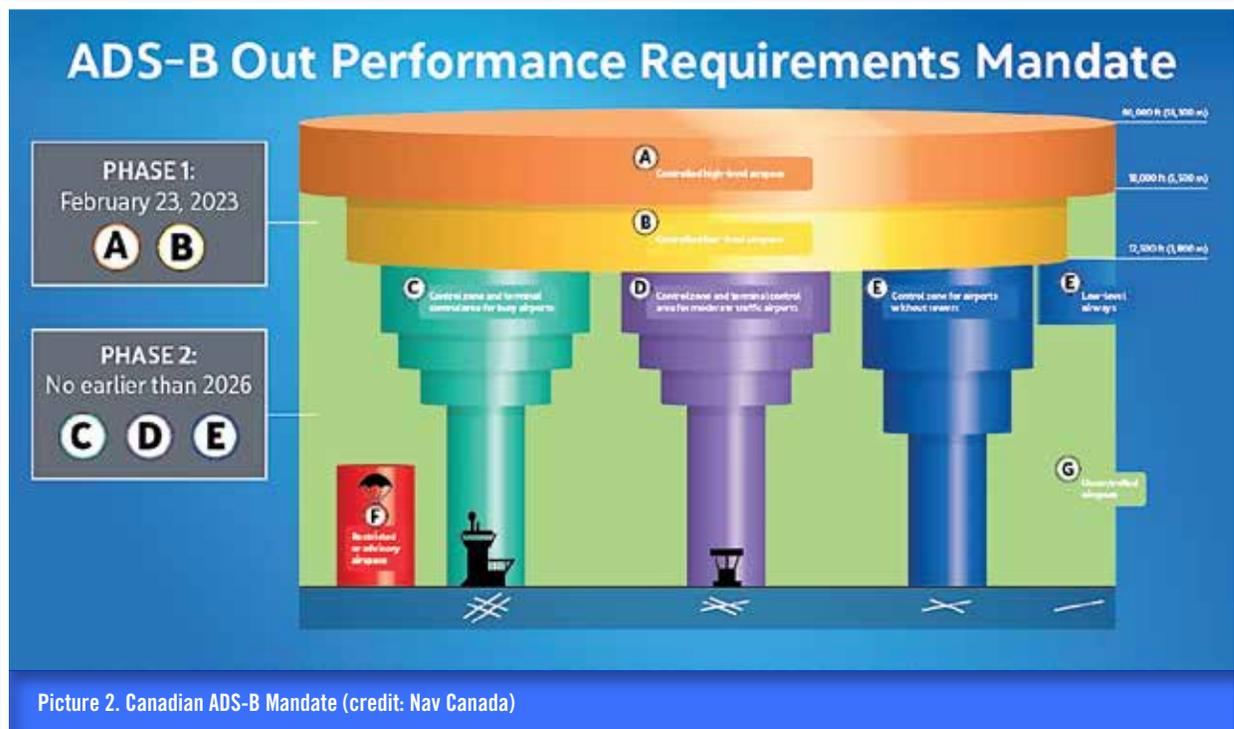
United States

In 2010, the Federal Aviation Administration (FAA) published an order stating that ADS-B Out will become a mandatory equipment requirement for all aircraft operating in airspace Classes A, B, C, and

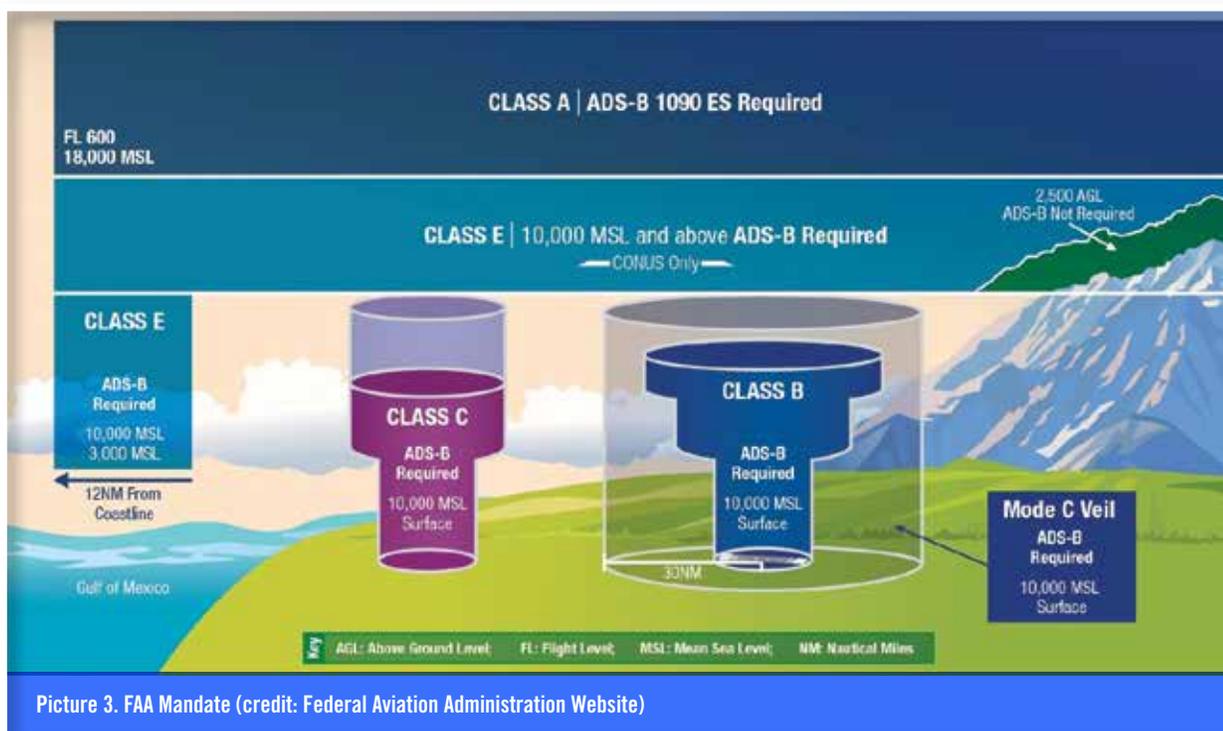
above 10,000' in E (with some caveats) starting 1 January 2020. (see Picture 2) The Code of Federal Regulations (CFR), specifically Section 91.225 of Title 14, dictates the requirements for ADS-B equipment and use. The FAA also has a special provision (91.225[g]) to cover aircraft that do not observe ADS-B requirements, whether that is due to ADS-B equipment unserviceability or a non-equipped aircraft. This provision is written with the spirit that it is to accommodate aircraft in unforeseen circumstances and is not meant to allow prolonged operation of an aircraft not suitably equipped. In this case, ATC must be given at least one hours' notice of the aircraft's operation in ADS-B airspace, and ATC must grant the exemption. ATC may deny the request based on workload, air traffic flow and weather conditions to name a few. Exemptions will not be granted airborne, nor will they be granted by phone to ATC—to ensure ATC resources are not held up by requests. Instead, a pilot must visit an FAA website called ADAPT (ADS-B Deviation Authorization Preflight

Tool) to request their authorization. Special allowances are made for U.S. national defence, homeland security, first responders and law enforcement aircraft.¹

All non-ADS-B Out equipped Canadian Armed Forces aircraft CANFORCE flights within the U.S. National Airspace System (NAS) and/or ADS-B designated airspace will continue to operate as prior to the mandate coming into effect. Standard (Annual/Blanket) diplomatic clearance procedures apply. When flights are conducted in the U.S. under the annual/blanket diplomatic clearance from the Department of State (DoS), the FAA will automatically issue a corresponding ATC authorization under 91.225(g). Priority routing, however, may be given to ADS-B Out equipped aircraft for airspace management and safety reasons.² Important reminder for aircrew flying to the U.S.; ensure proper ADS-B code annotated on flight plan as per GPH204A, Article 413, Item 10 (if ADS-B equipped) and include "STS/STATE" in Other Information (Item 18). MEDEVAC flights



Picture 2. Canadian ADS-B Mandate (credit: Nav Canada)



should use the CANFORCE call sign with “STS/MEDEVAC.” RESCUE or NORAD flights can still use RESCUE or assigned NORAD call signs and include “STS/STATE.”

European Union (EU)

Originally, Regulation (EU) No 1207/2011, published 22 November 2011, outlined the ADS-B requirements and mandate timelines. However, due to COVID and other matters, the EU amended their original regulation by issuing Regulation (EU) 2020/587 on the 29th April 2020.

The mandate explained that by 7th December 2020, all aircraft operating under Instrument Flight Rules (IFR), within the Single European Sky (SES), must have transponders that are compliant with Mode S Elementary Surveillance. From there the EU ADS-B mandate differentiates requirements based on aircraft type. For fixed wing aircraft operating with a max certified takeoff weight of more than 5,700 kg/12,566 lbs, travelling greater than 250 knots and for which a certificate of

airworthiness was issued on or after 7 June 1995, would have to conform with Elementary Mode S, ADS-B Out and Mode S Enhanced Surveillance. Aircraft other than fixed wing, with the same characteristics, require compliance with Elementary Mode S and ADS-B Out. Exemptions to these requirements do not apply to aircraft that are

1. undergoing maintenance,
2. being flown for export or
3. the aircrafts operations will cease no later than 31 October 2025.

At this time the EU is not making ADS-B mandatory for General Aviation aircraft, however ADS-B is highly recommended regardless.

We hope this article has helped refresh and renew your understanding of this emerging technology. Of course, this system will develop and change with technological advancements, so it is suggested in your pre-flight planning

to revisit local, national and international regulations, operating procedures and requirements to ensure you’re properly equipped or have the proper exemptions in place. Thanks for reading, and please feel free to write to our email address above should you have any other questions. ✈️

References and Acknowledgements:

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For Professionalism

For commendable performance in flight safety

Master Corporal Kevin Kelly



Photo: Cpl Dominic Duchesne-Beaulieu

On June 9, 2021, MCpl Kevin Kelly was conducting training on refilling the aircraft liquid cooling system. While doing the pre-operational inspection, he stopped at one of the steps that advised to inspect for moisture and verify that the desiccant color was blue. In this case, the desiccant was pink. MCpl Kelly discussed the situation with AMSE and found that the distributor had just completed his annual verification. MCpl Kelly, on his own initiative,

investigated the circumstances and discovered multiple issues that had gone undetected, including an inaccurate booklet for EME section, new parts not meeting the desiccant staining criteria and a lack of available parts for the repair of the distributor. In addition, the analysis led to a contamination risk assessment at the fleet level.

MCpl Kelly noticed that there was no requirement for recording fluid color in the routine

maintenance logbook and has initiated a request to modify the DMS system in order to integrate the recording of this task. The publications were also updated in order to avoid a repetition of the incident. MCpl Kelly's devotion to training, his daily professionalism, his constant respect for procedures and his concern for safety, make him fully deserving of this *For Professionalism* Award. 🇨🇦

Good Show

For Excellence in Flight Safety

Corporal Jason Pauley and Aviator (T) Braden Larose



On 11 Mar 2021, Cpl Jason Pauley and Avr (T) Braden Larose were assigned to inspect the Landing Gear/Tail section during the periodic inspection on aircraft CP140103. During this inspection, they found a frayed elevator trim cable on the left-hand elevator trim actuator. Upon further investigation, using references, they had determined that the cable was within allowable limits. However, a discussion ensued between the members, and they determined that the frayed trim cable, although within limits, posed a potentially serious hazard to the safety of the crew and the aircraft. They decided to take it upon themselves and initiate the removal of the elevator trim panel to perform a detailed inspection of the entire area.

Once the floor boards were lifted, Cpl Jason Pauley and Avr (T) Braden Larose then identified two larger diameter cables in the vicinity, identified as the aileron primary control system. The cables and the two turnbuckles for the closed loop system were

completely missing their lock wire. The cables were also beginning to thread out of their respective turnbuckles. The members immediately initiated a CF215 and quarantined the aircraft. They discovered that the last time the aircraft was worked on in that area was 1.5 years prior and the two cables were not listed in the work entry, therefore the incomplete work had gone unnoticed for an extended period of time. The release of the aileron primary control cables would have created a high potential for loss of valuable assets and loss of life or serious injury to personnel.

Cpl Jason Pauley and Avr (T) Braden Larose demonstrate outstanding professionalism, keen powers of observation and dedication, which prevented a catastrophic and inevitable accident. It is without a doubt that Cpl Pauley and Avr Larose are very deserving of the Flight Safety *Good Show* Award. 🔥

IS YOUR PICTURE

WORTH A THOUSAND WORDS?

by Cpl Kyle Morris

Picture yourself in this scenario for a moment (no pun intended!); you're running the servicing desk one night and someone approaches you to advise of a flight safety occurrence. Besides the first obvious thought of making sure personnel are OK, you know another important aspect is to make sure you get pictures for the Flight Safety Report.

When you call the imaging section, there is no one available. You have a simple point and shoot camera available or more likely, your cellphone and you think, hey, I can just send someone out to grab a few shots. We live in a great time for photography in the sense that almost everyone has access to a high-quality camera on them, but without a trained eye you may wind up with some high-quality pictures that aren't useable at best or tell the wrong story at worst. Ensuring the pictures you get are useful for investigative purposes need not be a complicated task, it just requires you to train your eye to a few key areas of a scene.

If available, you should lean on Image Techs as your "Go-to" resource for Flight Safety (FS) investigation photography. They will ensure you get proper coverage of the scene and will provide you with the highest quality imagery available, but situations like COVID have made everything more difficult and this just may not be an option. The A-PH-007-000/AG-001 is the CFTO used by Image Techs when covering aircraft investigations, and while it goes into a

great level of detail regarding the full coverage of aircraft investigations, you can follow some key concepts when taking pictures for your FS investigations and improve your results. Here are some key points to remember, so that even if your pictures aren't square or may end up underexposed, they will still provide immense value to investigators.

How do you make sure your picture is worth 1,000 words?

Always start with an establishing picture of the scene. In this picture, you want to make sure that you get a nice wide shot of the area that includes the aircraft during the FS. You also want to make sure that the identification and tail number of the aircraft are visible in this shot. This will help with the overall linear flow of your storytelling when you have all your images compiled, and help investigators get a sense of what may have been happening during the FS.

Next you want to get a medium view picture, focusing more on the general area of the aircraft damage or maintenance issue (i.e. Flaps, Engine, or Landing Gear). Again, we're trying to keep to linear storytelling, so the first shot may have shown us that for our FS we're dealing with an aircraft in a hangar; now we show that the FS was on the landing gear with this medium picture.

Then you want to get close up pictures of the specific area of focus. While good lighting is

always important in photography, it's most important at this stage of your investigation, as you can lose crucial details to shadows. If the shadows aren't too bad, you can use many different types of photo-editing software to correct this (get help from your Image Tech friends), but if the shadows are too dark when captured, all details in that area are lost and no edits will recover your details. To ensure success, it's best to always use an external source of light. Even a simple flashlight should be more than sufficient for this, but use the highest quality light source you can. It's also useful at this stage to use some references in your images to show scale. A ruler is the best choice, but if that isn't available, it's still beneficial to use a common item like a pen, a coin, or a tool to help.

Lastly, take pictures of any other items of interest in the areas of the FS. If the aircraft contacted something in the hangar during towing, it would be crucial to also get pictures of the area struck by the aircraft, showing things like paint marks or dents. If the aircraft skidded to a stop, you could also take pictures of the tire marks for reference of the direction travelled. It's impossible to list every item of interest here, but when in doubt, its digital not film, shoot more!

And remember, if you want to learn more, feel free to reach out to your local Imaging Section and they will be happy to help. 🔦



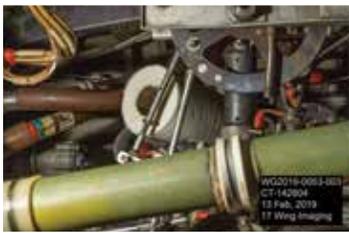
Birdstrike Good

Photo is well exposed, and any glare has been eliminated. You can see all the details of the area of impact, and a ruler was used to show to scale. A perfect example of how to capture a detailed picture while avoiding glare from either the sun or an external light source.



Birdstrike Bad

Photo is cropped in too tight, so not all damage is visible. There is also terrible glare in the photo, either from the sun or an external light source that is obscuring the damage, and there is no ruler to show scale. Overall an unusable photo.



FOD Found Good

The area is well lit from an external light source, which brings out details in the surrounding structure and parts. The crop is well done given the cramped space, and while the area likely didn't allow for any other camera angles to be used, you still get an accurate view of the FOD in relation to surrounding parts.

Cracked Glass Good

Photo is well exposed. Even when working outside on a bright day you may need to use an external light source to capture details in areas that are in shadowed spots. The crop is excellent, and shows the area of the damage as well as the aircraft tail number.



Cracked Glass Bad

Photo is underexposed, which causes a lack of details to be visible. Even though it was shot outside, it was in a shadowed area and would have benefited from some external light, even from just a flashlight. The crop is also too tight, resulting in the aircraft tail number being cut off. While the crop being crooked is not a showstopper, do aim to have a properly aligned horizon in your shots as it can be disorienting to the viewer, and takes away from what you are trying to show.



FOD Found Bad

The area was not lit with an external light source, resulting in an underexposed photo that doesn't provide a lot of details. The crop is too tight as well, making it very difficult to get an idea of where on the aircraft the FOD was found. When taking the photo remember, you know your aircraft well, but others viewing your pictures may not be familiar with it, so make sure to include as many details as possible to help tell your story.

For Professionalism

For commendable performance in flight safety

Master Corporal Christian Michaud



The morning of 19 January 2022, Master Corporal (MCpl) Christian Michaud was the Traffic Technician controlling the ground crew supporting that day's flying. A CC130J Hercules was being prepped for a mission from Canadian Forces Station (CFS) Alert. The CC130 is warmed up internally before departure using portable Herman Nelson Heaters, one at the front and one at the rear of the aircraft.

While inspecting the heater at the back of the aircraft, MCpl Michaud noticed that the forward heater had caught fire, with flames protruding from the exhaust area approximately 3 inches high. Without delay he immediately made his way to the heater, shut it off, and covered the flame with the lid for the exhaust in an attempt to put out the fire. The larger flames died down but a smaller fire continued to burn internally inside the burner section. MCpl Michaud immediately actioned fire fighter support. Recognizing the heaters

proximity to the aircraft and the fact that the fire was still burning, he then quickly moved the heater a safe distance away.

MCpl Michaud's situational awareness and immediate decisive action to contain the fire and move it safely away from the Hercules prevented a potentially serious incident and averted having a larger fire develop at the aircraft. His demonstration of professionalism and dedication proves he is highly deserving of this *For Professionalism* Award. 🇨🇦



RCAF STRIKES BACK



by Maj Jill Sicard

Some people believe that all flight safety incidents can be prevented *wink — others may have differing opinions however, one thing we can agree on is that preventing bird strikes can seem like a mystery in flight safety.

When we hear the name Capt “Sully” Sullenberger, we automatically think of hero, and then bird strike nightmare! In 2009, a flock of birds crippled both engines of his plane, which he then safely ditched in the Hudson River.¹ Unfortunately, not every story has a happy ending, another more recent one that hits closer to home is the 2020 snowbird accident in Kamloops BC just after take-off when a bird ingestion caused engine stall conditions, and unfortunately ended in tragedy.

A bird strike is defined as a collision between a bird and an aircraft which is in flight or on a take-off or landing roll. A bird strike can be a significant threat to aircraft safety. Smaller aircraft can have significant structural damage and all aircraft, especially jet-engine ones, are vulnerable to the loss of thrust caused by the ingestion of birds by engine air intakes.²

Between 2008 and 2015, the International Civil Aviation Authorization (ICAO) recorded a total of 97,751 reported bird strikes globally. That figure is double the amount of reported bird strikes during the prior calculated period (2001-2007). The majority of these reports came from the European and North Atlantic regions as well as North America. Over half of these occurrences happened during the day (68%) whilst the most common points at which they happened were:

- During the approach (33% of cases)
- During take-off (31% of cases)
- Upon landing (26% of cases).

Those numbers above were pre-COVID, yet another problem that we didn’t necessarily associate with COVID is the rise in bird strikes. With the drastic decline in airline travel, birds moved into quiet airports. Now, planes are flying again, creating higher collision rates. “There has been a significant increase in risk,” said Phil Mountain, director of U.K.-based Birdstrike Management Ltd., which advises airlines and airports on mitigating wildlife risks.³

Compared to commercial airlines, the military has significantly more bird strikes which is due to the fact that we generally work at lower levels and conduct a lot more “aerodrome work”. According to an interview by BGen John Alexander in 2020, 87% of RCAF bird strikes do not cause any aircraft/personnel damage and 12% count for minor damage, leaving only 1% causing significant damage. While this may seem positive, it is still a significant issue in our Flight Safety world and bird strikes do occur often making the risk always present.⁴

Pandemic aside, the normal contributing factors according to Canadianbirdstrike.ca are as follows.

- Habitat features, including open areas of grass and water as well as shrubs and trees, provide food and roosting sites for birds. Even transient water accumulation on uneven pavements can be a significant bird attractant.
- Landfill and other waste disposal sites often attract large numbers of birds if they are not carefully managed.
- Some types of agricultural activity, on or in the vicinity of an airport, may attract birds.

Continued on next page

- Migrating birds often follow well-defined flight paths in considerable numbers. This can create a hazard if the flight paths are near an airport.
- Airports in coastal locations often have a much higher level of un-managed bird activity than do inland airports.
- Most airports contain considerable areas of grass within their perimeters. Even dry grass can be attractive as a loitering area for birds by day or night.

Upon reviewing the list above, one airport in particular comes to mind and that is 19 Wg Comox. Geographically, this airport fits into most of the above criteria, however, more recently, the RCAF through West Coast Wildlife Control Services (WCWCS) has established quite a rigorous routine of mitigating bird occupancy around the airfield which has contributed to its success in low rates of bird strikes despite its location.

Comox is located on the east coast of Vancouver Island, the airport itself is literally on the coast so the seagull and bald eagle population in particular is expansive. Many other types of birds are attracted as well due to the herring row in early spring, and let's not forget the yearly salmon run. In addition, just down the road is the Comox valley waste management centre. These conditions alone are enough to feed thousands of birds. It turns out that the birds quit migrating south because they had enough food source to last through the winter, and then some. The large airfield remains moist from fall through to spring and provides birds with plenty of worms crawling across the wet runways as well.

The WCWCS devised a very basic but effective way to get rid of the bird problem. They believe the only way to manage the problem is to remove the wildlife from the food or to remove the food from the wildlife.

To tackle the issue of birds on the airfield, WCWCS first ensures that birds do not land or feed on any paved surfaces. Then that concentration of effort is spread out across the airfield to ensure the birds do not get the opportunity to sit and wait for the wildlife management team to leave. How does WCWCS keep birds off the airfield? The team relies on deterrents that they can control, between sunrise and sunset, including scaring with noise, vocal calls, visual scaring using pyrotechnics or controlled lights, and scaring, to some extent, with dogs. Another subtle but important tactic is to employ trucks with the same markings, as birds are intelligent and learn to identify the markings. Due to simple presence of the trucks and staff over time, it is enough to deter birds.⁵

In addition, WCWCS took over the contract of bird control at the surrounding waste management centres. Landfills are a primary food source for migrating flocks so the same gull and eagle populations frequenting 19 Wing's runways were the birds feeding at the landfills. The requirement for having bird control at the landfill is for staff safety, the reduction of spread onto neighbouring properties, and damage the birds cause to equipment and property. Imagine 4,000 gulls and up to 800 eagles all crammed into a very small area, fighting for any scrap of edible refuse to eat onsite or nearby. It is not good for humans, nor is it good for the wildlife. Through 365 days of the year WCWCS worked to keep birds off the landfills and airports and finally after 26 months of constant pressure the bird's population diminished. This year the huge population of seagulls migrated south just as they were supposed to, resulting in far less wildlife traffic on the airfield and far less bird strike occurrences. Right now, there are approximately 95% fewer gulls during the winter months that used to feed and cause damage around the community, all due to the success of the employment of the simple tactic

of making stopping at the landfills and airfield an uncomfortable experience.⁶

This initiative has made great strides in our bird strike numbers and with consistent effort around the nation's airfield bases, the hope is that we can lower the risk of bird strikes on military aircraft in the RCAF.

So, in an ideal world, bird strikes could be entirely prevented but there are always outliers whose flying is unpredictable despite all the efforts put into place. The erratic behaviour isn't something we can control and therefore must be willing to accept some risk, but with the help of new technology and innovative measures, we can reduce that risk exponentially! 🦅

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For Professionalism

For commendable performance in flight safety

Sergeant Steeve Rondeau



Photo: Cpl Dominic Duchesne-Beaulieu

On 30 Sept. 2020, Sgt Steeve Rondeau, an Avionics Systems Technician working at 433 Sqn Flight Safety responded to a unique occurrence. While in Romania on OP REASSURANCE two CF-188 A/C returned from a live fire Close Air Support training mission, both pilots had reported gun jams on their respective A/C. On this particular training mission, high explosive and incendiary (HEI) rounds were used on the M61A1 20 mm gun system. Once the A/C had returned to

maintenance, it was discovered that there was evidence of an explosion inside the gun bay, damaging multiple Weapons Replaceable Assemblies on one of the aircraft. Sgt Rondeau informed DFS and his immediate COC creating a fleet-wide Ops Restriction forbidding the use of the HEI rounds, thereby preventing any further accidents on other A/C.

During this process he single-handedly identified, documented and catalogued every piece that either fell off the A/C or

was damaged, while directing the image technician taking photos. Although half a world away, he worked diligently with Quality Engineering Test Establishment gathering information and establishing causes aiding in their technical investigation. His professionalism and dedication throughout this challenging investigation have set the standard and he is more than deserving of this *For Professionalism Award*. 🇨🇦



SAFETY AND EFFECTIVENESS THROUGH WELLNESS

Photo: Cpl Robert Bottrill

by Capt Dawn Macauley, JRCC Halifax

Tuesday's were my favourite day of the week while I was a student pilot, then years later as an Instructor pilot at BHS (Basic Helicopter School). I habitually slept well, ate well and woke up refreshed and enthusiastic about the day. I'd head to the gym for a friendly, yet competitive game of ball hockey. It was more than physical exercise; it was a healthy dose of building relationships with the people of my community. After the game, a coffee with my mates would peak my energy levels and boost my morale. It sometimes felt like a wellness camp that fostered my ability to thrive under the mental, emotional and physical stresses of daily briefing, flying and studying. I maintained, throughout my career, a similar daily ritual in

preparation, which let me tackle the unique challenges of my profession. A balanced routine enabled consistent performance and growth. This is what it meant to me to be "fit to fly" as a student, in operations, and as an instructor.

When operating in the flying environment, each crewmember and technician is expected to take personal responsibility for ensuring that they are ready for duty. The RCAF culture, within the context of the Flight Safety Resilience Model (FS Issue 1, 2021, pg 25) and accident prevention, provides members with strategies and tools designed to evaluate their personal fitness for duty, such as the "IMSAFE" (Illness, Medical, Stress, Alcohol, Fatigue, Eating) checklist or the Fatigue Assessment

Report. These tools are effective in raising awareness of readiness, but they do not provide solutions for increasing personal readiness.

In the spirit of RCAF and Flight Safety culture, the everyday goal is to build knowledge and improve upon skills to become more effective, whilst ensuring safe execution. The culture of learning is embedded into our routine training and operations. According to the "Laws of Learning," for learning to occur, individuals need to be mentally, emotionally and physically ready to learn (FIH). Safety and effectiveness are therefore, directly linked to the ability to learn. Since our organization embraces the willingness to learn from past incidents, we have addressed the requirement to provide performance readiness and mental skills training.

The latest human error prevention tool is the implementation of the Performance Readiness Training Program through R2MR (Road to Mental Readiness). This program offers human optimizing strategies, which enhances personal performance through mental skills training. Since peak performance is a result of technical and mental factors, this training increases the safety of operations through (but not limited to) mindfulness, visualization and recovery techniques. Readiness training emphasizes wellness through the development of healthy habits, which augments the effectiveness of executing tasks under pressure. The goal is for members to manage their emotional, physical and mental development so that they are ready for duty and ready to learn. Wellness fosters safe and effective people.

Many Flight Safety occurrences are a result of inattention or distraction. Whether we are consumed by our phones, media outrage or our distracting and wandering thoughts, we all struggle to stay in the present moment sometimes. Mindfulness is about tuning in to the moment by using all our senses. It can be practised during any activity, including walking, doing the dishes, driving or while participating in a mindful meditation session. Mindfulness practice enhances our ability to maintain focus on a task and strengthens our power of attention and concentration. This skill is essential when conducting air and ground operations because it enhances situational awareness, hazard identification and perceptual processing. During pre-flight checks, for example, if you are distracted or have something bothersome on your mind (like relationship or financial stresses), you might find it difficult to focus on each individual check. If you go through the motions, but are not attentive to your observations, a critical component could be missed, resulting in an incident or accident. Conversely, if the task is completed mindfully,

relevant information is processed with more clarity, which reduces the chances of making an error. Practising mindfulness has additional benefits like reduced stress, improved emotional regulation and overall improvement in mental preparedness and well-being.

During the pandemic, one of the safety concerns discussed among leadership and within the Flight Safety system is skill erosion. Some technical skills require a lot of practice, and if there lacks proficiency, errors can and do occur. Visualization is a mental skill that can help combat this threat. Visualization is imagining yourself executing an action. Elite athletes, and other high-performance professions, practice this skill to rehearse for challenging situations and to consider proper response to potential threats with the goal of maintaining a high level of performance. Many pilots might equate this to “chair flying,” where hands and feet are moving to the beat of checks and procedures, thereby stimulating muscle memory and inputting code into the brain that can be accessed when required. It can be impactful when learning a new skill, when correcting errors on a specific task and when trying to improve accuracy of task shifting and decision-making. Through these benefits, it reduces skill fade. Visualizing also enhances regulation of emotional responses to intense, novel experiences, like emergency scenarios or underwater egress. Since access to simulators and aircraft can be limited, it is crucial for members to be able to access a mental image of their ideal execution to

bridge the performance gap between an average performance and maximum potential. Visualization helps to reduce errors by improving concentration, regulating emotional responses and enhancing mental dexterity. It gives us infinite access to practise through mental rehearsal, which can increase proficiency, maintain mental agility and prevent the rapid decay of learned skills.

Continued on next page



Photo: Cory Hunter

DOSSIER

On the other side of the spectrum, mental recovery from operations, training and intense learning is also essential to avoid errors that are a result of operator burnout. Mental fatigue and unfettered emotional states are among the highest cause factors for incidents in the RCAF (FC issue 1, 2021 pg 28, Figure 1.). When operation tempo gets overwhelming, the leadership of the RCAF tends to remind people to “enjoy your time-off” or “take care of yourself,” but this direction is subject to ineffective interpretation. If members lack the skills of maximizing recovery through a balanced approach, they will not effectively reset their readiness to prepare and perform. In fact, some members might choose to indulge in heavy drinking as their recreational activity. Or they might actively pour more of their energy toward work because life outside work can feel even more overwhelming and stressful. With the uncertainty of COVID, housing markets, relationships, international threats and other external stresses, individuals must learn skills in monitoring their wellness. Readiness training discusses effective coping and recovery strategies that mitigate mental and emotional burnout, enhance performance and create resiliency within the Flight Safety Program.

Our Flight Safety Program recognizes that success is about improvement and guiding the change required to address deficiencies within operations. The RCAF members and leadership have taken ownership of the program and continue to implement the change required to optimize human performance with the goal of preventing the loss of life. As the demands of our jobs increase and as our world becomes more laden with fear and anxiety, a focus on wellness will be essential for promoting optimal behaviours into the future. Wellness is an active pursuit of working toward an optimal state through preventative and balanced self-care. Balance refers to an individual’s recovery strategies to include physical (sleep, exercise, diet), social (family, friends, community), mental (hobbies, music, relaxation) and spiritual (self-awareness, nature, gratefulness) domains. A critical part of maximizing performance and maintaining wellness is taking time to do things that you love to do outside your work and performance domain. By developing skills that allow our bodies and minds to return to a calm state of control after intense activation, the results are augmented psychological endurance, reduced fatigue, tension, and improved physical and mental

health. To be resilient as an organization, we depend on resilient members. A culture of improving wellness leads to higher performance, which results in lower incident and accident rates, and generates a positive feedback loop within the RCAF and Flight Safety System.

When I received my RCAF Wings from my Uncle Marv (yes, Maj Marvin Macauley), he told me that my Wings represent “a licence to learn.” Personally, I am very passionate about my readiness to learn at work and in everyday life. Opportunities for growth exist with each new circumstance and each unique mission. From a safety and effectiveness perspective, learning in the spirit of flying operations has become a culture of learning how not to die. And, by learning the skills of preparation, anticipation, flexibility, emotion management, mental sharpness and precision, our culture has developed an art of learning how to live. 🦋

Sources

Flight Instructor Handbook, PRT facilitator manual 2.2, Flight Comment Issue 1, 2021 (pg 28, Fig 1 & pg 25 “Flight Safety Resilience Model”)



Photo: cpl David Cribb

For Professionalism

For commendable performance in flight safety

Master Corporal Robert Sherwood

On 28 Oct 2021, MCpl Sherwood's quick and efficient actions avoided a potential SAR delay but he also went above and beyond to develop mitigation strategies to avoid future errors for his section. A refuelling operation for a CC-115 Buffalo on SAR standby mistakenly had the truck-mounted additive injection system added to the already mixed fuel. MCpl Sherwood was immediately advised and ordered the grounded CC-115 to be de-fuelled and refuelled with properly mixed F-37. MCpl Sherwood then ensured the de-Fuller was expediently put back into service, decreasing the downtime of the SAR crew and ensuring minimal impact to the Wing's refuelling operations.

MCpl Sherwood proactively initiated the implementation of a preventative measure that was supported by RCEME. The measure ensures the additive system can no longer be physically engaged accidentally without impairing the functionality of the vehicle. MCpl Sherwood confirmed and completed these steps before the commencement of the FS investigation. He then took it upon himself to brief all refuelling operators on the occurrence and modifications. MCpl Sherwood's quick actions, creative thinking and diligence on this very simple equipment modification are indicative of an admirable mind for Flight Safety and is more than deserving of the *For Professionalism Award*. 🏆



Photo: S1 Brendan Gibson

LESSONS LEARNED



Photo: Sgt Paz Quillie

DON'T Identify Unknown Targets

by Capt Akshaya Murphy

It was a bright sunny day off the coast of Vancouver Island at CFB Comox. I was a second lieutenant who was a newly qualified VFR (Visual Flight Rules) controller. It was a pretty good day so far with plenty of traffic, but it started to slow down. Suddenly, an aircraft (AC) called up on the radio:

AC: “Comox Tower, this is [Callsign], [AC Type], at 5,000 feet, Port Alberni”

Tower: “[Callsign], Comox Tower, [current altimeter], confirm current location, final destination, and last point of departure, squawk ident”

AC: “Squawking ident and Port Alberni, and uhhhh Qualicum”

Tower: “[Callsign], Roger. Confirm Port Alberni is your current location?”

AC: “Yes Tower, Port Alberni”

The radio transmissions were fuzzy and intermittent, with some feedback. I did a

radio check, and the pilot didn't respond. They also didn't respond when I tried to confirm their destination and point of departure. On the radar, I saw a target at 5,000 feet, over Port Alberni, which was out of my control zone. SOP (standard operating procedure) for aircraft not planning on entering the control zone was to identify the target if possible and send them over to the IFR (Instrument Flight Rules) controller for flight following if the pilot wanted this service. Otherwise, the aircraft was instructed to change to another appropriate frequency.

Tower: “I am unable to see your squawk. Port Alberni is outside my control zone, would you like flight following with Comox Terminal?”

AC: “Sure Tower, that sounds great, I'm having transponder issues, which could be why my squawk may not be showing up”

I was debating on whether to identify him using an alternate method: “Over a Fix.” This method was used when an aircraft's reported

position and altitude is over a known fix such as a VFR reporting point, or IFR waypoint; the position is consistent with the target observed on the radar, and when you're 100% certain it's the target in question.

Ultimately, I chose not to identify the target as I wasn't certain that it was the aircraft that I was speaking to. Minutes later, I saw the IFR controller identify a target on the radar, with the same call sign and aircraft type that I was just speaking to. However, this target was all the way near Qualicum at 5,000 feet.

It turns out, he departed Qualicum and was on his way to Port Alberni. I was relieved that I didn't identify the wrong target and instead, handed it over to the terminal. It would have been a huge flight safety and unsafe error on my part. Remember not to doubt yourself and make sure you are always working safely especially if people's lives are in your hands. ✈️

For Professionalism

For commendable performance in flight safety

Corporal Ryan Shea



Photo: Capt Nicole Morrison

On the morning of 19 Nov 2021, while performing a 25 Hour/30 Day inspection on a CH-146 Griffon at 444 Squadron, Goose Bay, Cpl Ryan Shea discovered a Hydraulic line coming from the #2 system pump case rubbing against the aircraft's left-hand beam assembly. Flight Safety was contacted, appropriate steps taken, line removed, and damage inspected. However, Cpl Shea didn't stop there; he then informed the UFSNCM that he recently adjusted one of those lines on a different aircraft. The Hydraulic

line was rubbing against a panel, which attached to the main structure of the aircraft. The line had chafed well beyond its limit. Failure of this line would have depleted hydraulic system 2 causing a "LAND AS SOON AS POSSIBLE" emergency in a remote area at below-freezing temperatures. The damage sustained required a maintenance repair party from another unit. While discussing the issue with a member, it was discovered that 400 Squadron had the same issue on one of their aircraft which was undergoing maintenance.

This, combined with Cpl Shea's previous experience, revealed a possible systematic issue. DFS and Bell Helicopters recommended a fleet-wide Special Inspection which is still pending.

Cpl Ryan Shea's attention to detail, professionalism, and excellent technical knowledge prevented a potential critical emergency in a remote area and improved the safety of the entire fleet via the Special Investigation. Cpl Ryan Shea is most deserving of the *For Professionalism Award*. 🇨🇦

LESSONS LEARNED

MORE THAN A NUISANCE

by Capt Pete Sokol

Photo: St Justin Spinello



Photo: 12 Wing Shearwater

During my time as a CH148 Cyclone pilot at 12 Wing, I noticed on several occasions that when flying from the left seat without the Slim Line Backpack (SLBP), an ALSE requirement for overwater flight, the cockpit wing armour would press against my left arm (the one moving the collective for those non-rotary folks), particularly when in the hover. I never thought of it beyond a nuisance and added it to the list of annoying things about the cockpit. Furthermore, this aircraft was cleared to fly so this nuisance must have already been addressed. It wasn't until I returned to flying the CH148, as a Test Pilot for AETE, that I realized my mistake.

I had forgotten about this "nuisance" and was reminded during a proficiency flight prior to some testing in Shearwater. The moment I felt that wing armour press into my arm my test pilot mind kicked into gear. Using an aircraft in the hangar on ground power, I conducted a quick "reach and accommodation test" for various ALSE configurations. What I found shocked me; I could only get adequate collective travel through the first 50% of the collective range when seated without the SLBP. My arm would get sandwiched between the stowed wing armour and the outer edge of the seat back. In most cases Cyclone pilots don't need to use more than 50% collective, but what would happen when you needed it? (Think autorotation or a poorly controlled approach.) For the previous two years, 12 Wing pilots had been flying like this on overland missions.

I filed a Hazard Report through 12 Wing Flight Safety (FS) to make sure this issue would get addressed quickly. The wing armour was removed and is only used when operationally required. The wing armour installation is now being looked at in more detail to provide a safe solution which will allow pilots to fly without the SLBP.

So, what did I learn? When something doesn't feel right, take the time to figure out why, even if you just think it's a nuisance. A quick chat with my unit FS team would have made me realize that this issue fit the conditions for a Hazard Report and those extra years of flying with the hazard could have been avoided. 🚩

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 CAF and who emulate the values and ethos promoted by the Program.



MWO Pitman



Mr. Woodward

DOCUMENT *Review*

by Capt JS Wilson

At 434 Operational Test and Evaluation (OT&E) Squadron we conduct operational tests and evaluate new equipment coming into services and sometimes equipment that is already in service. What might seem like a small piece of equipment could entail a huge amount of work to make sure all documents are updated, procedures examined, and functions as expected. Depending on the Test and Evaluation Flight (TEF), there may be experts on the existing equipment and sometimes even on the new. Most often, though, the Project Officer (PO) may not have direct expertise or knowledge on the

equipment to be tested. So one of the first steps of any project is to do a thorough review of all related documents.

The document review phase can be the most tedious and sometimes the most laborious phase of any project. When it involves any existing equipment, especially something that has been used for years, one would assume that most of the documents pertaining to it would be in order.

When I was assigned the Search and Rescue Technician Personal Equipment Lowering System (SAR-PELS), I thought things would be

straight forward since it was granted Operational Airworthiness Clearance (OAC) in July 2014.

With SAR-PELS, several important documents either lacked information, contradicted each other, or would outright jeopardize the safety of those using it. For instance, SAR-PELS OAC was granted on the CC-115, CC130H, and the CC130J but the CSAR 7 Parachute Assembly only has OAC on the CC-115, and the CC130H. Meaning that SAR-PELS can be used out of the CC130J but the parachute assembly cannot.





This may seem quite obvious that no one would jump from an aircraft without a parachute, but other documents were unclear.

The Standard Manoeuvre Manual (SMM) for CC130H Search and Rescue (SAR) Operations listed the normal SAR aircraft airspeed for drop

configurations as power-off stall speed plus 20 knots. The SMM CC130H SAR Flight Crew Checklist had the aircraft airspeed for airdrops as the power-off stall speed. Which one was right? In this case, the governing document, the SMM for CC130H SAR Operations was incorrect.

Additional documents excluded packing instructions and emergency procedures even though they said they were included. All these documents are the cornerstone to any operation and provide the overall structure on how to safely configure and operate the aircraft/equipment. Having consistent, concise, and correct documents are key requirements for the prevention of a future incident. Imagine how difficult it must be for someone working on equipment or checklists when they cross-examine documents and find conflicting information! This is definitely a flight safety we here at OT&E try our hardest to avoid, sometimes the tedious background jobs can be some of the most important jobs when it comes to Flight Safety. 🚀



Photo: Cpl Jennifer Kusche

From the Investigator

TYPE: CT145D King Air 350 (C-GEAS)

LOCATION: Thunder Bay, ON (CYQT)

DATE: 31 January 2022

The accident involved a CT145D King Air 350 from the 8 Wing Multi Engine Utility Flight (MEUF). The mission consisted of a multi-day cross country training and familiarization trip with three military aircrew members onboard. The accident happened on the first segment of the mission.

The crew were prepared and cleared for the RNAV Z 25 instrument approach into the Thunder Bay Airport.

The weather consisted of light winds and good visibility, with a ceiling at 2200' AGL.

The approach proceeded normally and as the aircraft crossed through 600' AGL, the flying pilot elected to disconnect from the autopilot and continue under manual control. Shortly after the aircraft crossed over the threshold of runway 25, the flying pilot reduced the two power levers to the idle position for landing. The aircraft experienced a yaw to the left and a significant drop of the left wing.

The crew initiated an overshoot, however the aircraft continued to descend and the left wing impacted the runway surface. The aircraft progressed off the runway onto the snow-covered infield. After the aircraft came to rest, the crew conducted an emergency shut down and exited the aircraft.

The aircraft damage level is still being assessed and one crew member received a minor injury.

The investigation is focusing on Materiel and Human Factors. ✈



Photos: Mr. Leblanc



From the Investigator

TYPE: CH149 Cormorant
(CH149903)

LOCATION: 9 Wg Gander, N.L.

DATE: 10 March 2022

The accident aircraft, call sign "Outcast 903", with a crew of six, was scheduled for two crew training missions based out of 9 Wing located at Gander International Airport (CYQX), N.L. The first training mission was scheduled in the afternoon and was primarily focused on overland Search and Rescue evolutions for the Flight Engineer Under Training.

At the end of the first training mission, the crew conducted hover work in the vicinity of the intersection of Runway 31 and Runway 21. During the final clockwise hover turn sequence, the pilot flying's seat unexpectedly descended to its lowest position. The aircraft flight vector immediately reversed from a clockwise rotation to an accelerated counterclockwise left yaw about the aircraft mast. As the aircraft continued to yaw left, the attitude of the aircraft became unstable resulting in an increasing right bank attitude. The aircraft rotated through approximately 400° and as the right rolling moment intensified, the right outboard wheel, the horizontal stabilizer

assembly located on the right side of the tail section, and main rotor blades impacted the runway at 15:43 local time. There was no post-crash fire.

The aircraft impact with the ground caused very serious damage. Three of the six occupants

sustained minor injuries while two occupants sustained serious injuries.

The investigation is focusing on materiel and human factors. 



