National Defence / Défense nationale

Flight Comment

ISSUE 1, 2014

DOSSIER
The Air Image Tech

DOSSIER
One of the Best Pieces of Advice

LESSONS LEARNED
How Urgent is your Emergency?

SÉCURITÉ DES VOLS FLIGHT SAFETY

Canada

Photo: MCpl Colin Aitken

Views on Flight Safety

By Major-General Pierre St-Amand, Commander 1 Canadian Air Division

The Royal Canadian Air Force (RCAF) has enjoyed a very high level of operational success over the last decade. From combat operations in Afghanistan and Libya through humanitarian relief in Haiti and the Philippines to our continuous domestic operations in SAR and NORAD, the airmen and women of the RCAF, have proven themselves consistently as a highly dedicated and professional air force, meeting each challenge with the flexibility required to enable rapid effects and constantly exceeding our joint and coalition expectations. Yet this exceptional period has not been without losses, both in equipment and most importantly, in personnel. As it was for past operations, we find ourselves in a situation where Commanders at all levels must carefully manage operational risk given a myriad of variables and inter-connected processes in an effort to optimize operational output. **The area where Flight Safety (FS) ends and where operational risk starts is not a mutually exclusive proposition: both processes are absolutely required, in unison, to enable the best possible operational output.**

The RCAF uses a Technical Airworthiness (TA) program to ensure our personnel have airworthy/suitable equipment to operate and an Operational Airworthiness (OA) program to ensure we have the proper/appropriate training and procedures to effectively employ our weapon systems at an acceptable level of safety (ALOS). For training and non-combat roles, this would, in theory, be sufficient to effectively manage risk.

For operations in high risk environments/situations and combat roles, the RCAF has developed other command processes to further manage additional risk, especially those found in theatres of operations. A prime example of this is the mission acceptance/launch authority process adopted by the Air Wing in Afghanistan, which further refined the risk level assumption process and ensured it was accepted at the proper level of Command.

Our history and experience has shown that, in isolation, these processes are insufficient if the goal is to minimize the accidental losses of our limited and valuable resources. To that end, the RCAF has developed a highly efficient world class FS program that, when used effectively, further mitigates operational risks on two fronts. Firstly, FS proactively promotes the requirements, training and best/safe practices previously identified and supported in the TA and OA programs. FS relies on the development and maintenance of a "just culture" throughout the RCAF, to encourage open and honest reporting of flying related air and ground incidents and accidents to facilitate a greater awareness of emerging trends. Secondly, through investigations, FS develops preventative measures that contribute to a reduction in risk and a timely return to an ALOS condition.

Unacceptable non-combat losses were the genesis of the RCAF FS program during the Second World War. Recent operational experiences prove this to remain a valid concern today. The RCAF FS program is a tool that provides commanders at all levels with a constant spotlight on the fundamental airworthiness programs when our focus on mission success may interfere with/interrupt our clear judgement. Maintaining a robust FS capability in theatre and during combat operations is vital to a commander so he or she can still optimize the availability of operational resources.

During my time as Comd 1 CAD and as the Canadian Joint Operations Center Joint Forces Air Component Comander, I have observed our airmen and airwomen in action in multiple theatres of operation and varying operational risk situations. At all times, our FS record was second only to the degree of operational excellence we consistently achieved. Both of these metrics are revealing: without a sound FS program, delivering excellence in operations would likely be a bridge too far. ◆

The Editor's Corner


FLIGHT SAFETY

SÉCURITÉ DES VOLS

FLASH

Issue 2 2014

Numéro 2 2014

12-TON JACK FAILURE

Refs: FSOMS 158844 and 159227

DÉFAILLANCE VÉRIN DE 12 TONNES

Réf: SGESV 158844 et 159227

Welcome to the first issue of the Flight Comment magazine for 2014. This year promises to be a great one for us here in Directorate of Flight Safety (DFS) with all of our new staff trained and ready to produce the best possible product. To start off I would like to thank all of you that have made contributions to the magazine in the last three months, it makes my job more easier when proactive individuals have a good idea and put "pen to paper" to convey it to the readership.

What I like about this issue is the strong "decision making" theme that manifested itself. I find it very timely considering the controlled ejection that took place at 2 Canadian Forces Flying Training School (2 CFFTS) in January of this year, as well as the recent tragedies of Canadian Air Force (CAF) personnel taking their own lives. While at first glance these things may seem unrelated, I see them as intertwined, let me explain.

To start, as the Promotions Officer/Editor for DFS, I have very little to do with the investigations that take place in DFS and therefore hold no "inside information" on active investigations. On the other hand, I am a CAF aviator and thus have some idea as to how a flying training establishment operates in the event of an emergency.

In the case of the controlled ejection I can surmise that when this emergency took place, the intellectual weight of the "Big 2" rushed to the support of the distressed aircrew. In fact the wealth of knowledge/resources made available to them leading up to the decision to eject must have been massive. The CAF does a very good job of supporting its aircrew and their aircraft in operation and training. I know (without actually knowing the details of the investigation) that the best decision was made based on the situation at the time. Imagine the expertise that must have been brought into play prior to the decision to eject; aircraft experts, senior maintainers, experienced Qualified Flight Instructors (QFIs), former test pilots and the chain of command of the school. At the end of the day, as the ejection handle was pulled, the pilots holding said handle were readied and because of the support made available to them, were able to walk away. But where did this extra support start? By the instructor (or student) holding down the press to talk (PTT) and declare that their aircraft needed assistance.

This level of support is not reserved for aircraft or aircrew; anyone can ask for assistance when they're in duress. The resources available to an individual are just as abundant (if not more) as an aircraft in an emergency. I may not be a Padre or Social Worker, but I have been in the military for the better part of my life and have seen people land on their feet by utilizing these services. With all of that being said, I also understand that there are people who are uncomfortable dealing with "official" services, which brings me to my final point.

Think back to basic training for a moment; every single member of the CAF was introduced to the idea of a fire team partner. You slept together, you ate together, laughed and most likely cried together. For that time period you were each other's everything, regardless of your future trade or the colour of your headdress. This was not only to teach the most basic of military formations but also to reinforce the idea of looking after one another and foster the values that tie us together as members of the CAF. To this day, I can still hear my directling staff yelling "Baker, where is your fireteam partner" and the feeling of dread for losing my most essential piece of kit. It is our obligation as soldiers/sailors/aviators to act when presented with adverse situations. From Private to the Chief of the Defence Staff, we are each others most essiental "kit" and the unnecessary loss of a single "brother" or "sister" weighs on us all.

In conclusion, if it seems dark and lonely in your cockpit there are resources available (formal and informal) to bring you back to the ground safely. Inversely, if you notice a member in distress, you ARE that resource and it is your duty to reach out, you may be the difference. All you need to do is reach out and "Press to Talk".

Fly well and look after each other!

Lt T.J. Baker

Photo: Cpl Jean-Francois Lauzé

Flight Comment

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THE CANADIAN FORCES FLIGHT SAFETY MAGAZINE

Flight Comment is produced four times a year by the Directorate of Flight Safety. The contents do not necessarily reflect official policy and, unless otherwise stated, should not be construed as regulations, orders or directives. Contributions, comments and criticism are welcome. Contributions become the property of Flight Comment and may be edited for content, length or format.

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National Defence Headquarters
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To contact DFS personnel on an **URGENT** flight safety issue, please call an investigator who is available 24 hours a day at 1-888-927-6337 (WARN-DFS).

The DFS web page at www.rcaf-arc.forces.gc.ca/en/flight-safety/index.page offers other points of contact in the DFS organization or write to dfs.dsv@forces.gc.ca.

ISSN 0015-3702
A-JS-000-006/JP-000

For Professionalism

For commendable performance in flight safety

Captain Dave Hunter

On 18 October 2012, a CC130 *Hercules* was conducting standard training circuits on Runway 30 in Greenwood N.S. The crew had been conducting touch and go landings. On the third landing a stop and go was requested with a back track to the runway threshold for take-off, which was approved. While on the back track, Capt Hunter, the tower controller, observed persistent smoke coming from the left rear tire which he conveyed to the aircraft crew. The Flight Engineer verified that the smoke was not dissipating. The flight was terminated and an emergency declared. Once off the runway and with fire trucks enroute, the ground evacuation procedure was carried out.

The arriving on scene fire crews identified hot brakes as a major contributing factor to the smoke. However upon further investigation by maintenance crews a small hydraulic leak was found in the armpit of the wing. This leak allowed hydraulic fluid to drain down the fuselage and into the brake system, causing smoke and a risk of fire.

Had it not been for Capt Hunter's keen observation and immediate action, the crew would not have known they had hot brakes or a hydraulic leak and would have taken off immediately after the back track. This could have resulted in an in-flight fire with all associated threats to life and equipment.

Capt Hunter is commended for his extremely diligent attention to detail which directly prevented what could have become a life threatening airborne emergency. He is most deserving of this For Professionalism award. ◆

Photo: DND

Corporal Duane Meville

While performing a replacement of a Radar Display Unit (RDU) on a CH124 *Sea King* helicopter, Cpl Meville, an Avionics Technician with 423 Maritime Helicopter (MH) Squadron, observed evidence of electrical arcing on the insulation blanket located behind an aircraft component.

The RDU is located within the dimly lit fuselage area on the side facing console. While removing the unit, Cpl Meville noted a black mark on the insulating blanket located behind the component. Knowing that a black mark could be a sign of electrical arcing, Cpl Meville decided to conduct a more comprehensive inspection. As a result, He discovered that the black mark was originating from a incorrectly routed wire bundle which was rubbing against the cooling fins of the RDU. The resulting fleet-wide Supplementary Inspection found eight additional aircraft had incorrectly routed wire bundles.

If it had not been for Cpl Meville's keen observation it is very likely that an electrical fire would have occurred and given its location, firefighting the source would be have been almost impossible. He is commended for his diligence in identifying and investigating this extremely serious hazard and is clearly deserving of this For Professionalism award ◆

Photo: Cpl Michael Bastien

Master Corporal Robin Eglinton

On 25 January 2013, MCpl Eglinton an Avionics Technician supervisor with 407 Long Range Patrol Squadron, was carrying out a post aircraft wash corrosion control lubrication on a CP140 *Aurora*. He noticed high frequency antenna one and two swivel mounts on the vertical stabilizer were incorrectly installed. The swivel mounts were installed with the opening to release the antenna oriented inward instead of outward. These swivels are designed to release the antenna from the aircraft in the event of antenna breakage thus preventing the antenna cable from possibly wrapping around the vertical or horizontal stabilizers which could impede or prevent the use of those flight controls. MCpl Eglinton brought the condition of this aircraft to his supervisor's attention, initiated a detailed Flight Safety report and a survey of all other sqn aircraft was carried out to check for similar antenna conditions.

MCpl Eglinton's outstanding attention to detail and high level of professionalism while performing his duties directly resulted in rectifying a situation that if left uncorrected could have led to serious damage or loss of an aircraft and crew. MCpl Eglintons' meticulous professionalism is very deserving of this For Professionalism award. ◆

Photo: Cpl Jennifer Chiasson

Corporal Dean Smith

On August 23 2013, Cpl Smith, a Flight Engineer (FE) instructor at 440 Transport Squadron, was tasked to a Ranger extract mission on a CC138 *Twin Otter* around Watson Lake. On the climb out from Yellowknife, the aircraft's bleed air valves were opened in preparation for the enroute portion of the flight. At this time Cpl Smith noticed an unusual amount of noise coming from the forward ceiling panels, and immediately notified the pilots. After a brief discussion of possbile courses of action, which included discussing whether this noise was indeed abnormal or normal, and if the mission should continue with the bleed air off, the crew determined it would be best to return to base and have the aircraft examined by maintenance.

Upon landing a maintenance team was waiting for the aircraft and after a quick investigation determined that the "peri seal" had slipped out of position. This resulted in extremely hot bleed air being blown into the plastic overhead panels, which contained a 2 inch thick wire bundle within only a few inches of the leak. The fault was promptly repaired, and the aircraft and crew resumed their mission with less than an hour's delay.

Had the bleed air leak not been recognized, or Cpl Smith had not been adamant that there was a problem, there is a high likelyhood that this situation would have manifested into a serious incident involving a fire with loss of electrical systems, or worse. Cpl Smith's exemplary actions serve as an inspiration to his peers and supervisors alike and make him very deserving of this For Professionalism award. ◆

Photo: DND

For Professionalism

For commendable performance in flight safety

Corporal Robin Quenneville

On 9 February 2012, Cpl Quenneville, an Aviation Systems technician employed with 438 Tactical Helicopter Squadron, was tasked to troubleshoot the source of a snag on the #2 throttle of CH146 *Griffon* fleet. Stiff or "ratchety" throttles are fairly common in the CH146 fleet; thus, Cpl Quenneville proceeded to open all of the access panels normally associated with the investigation of a throttle friction problem. After removing the panels, Cpl Quenneville performed a detailed visual inspection and cleaned the affected throttle gears.

The functional check confirmed that the throttle assembly was now within limits. Before reinstalling the access panels, Cpl Quenneville executed a FOD check of the entire area and in doing so, made note of what he suspected to be an improper hardware stack-up on the co-pilot collective stick minimum friction clamp. He proceeded to inform his supervisors of his suspicions and, after verifying the illustrated parts manual, confirmed that the assembly of the friction clamp was, in fact, incorrect. Had the existing improper assembly of this extremely critical flight control system not been rectified, a crack may have developed as a result of the undue stress on the friction clamp. Furthermore, there was a high risk of the system failing in flight, which could have had grave consequences.

The fact that Cpl Quenneville successfully identified this issue is especially noteworthy when considering that the flight safety investigation revealed that this condition likely existed for several months before his discovery as well as the fact that the aircraft had recently undergone a major inspection. That this condition was discovered in conjunction with a relatively common task speaks to his professionalism and acts as a lesson to all technicians as to the perils associated with complacency. Cpl Quenneville's attention to detail is beyond reproach, and therefore he is extremely deserving of the For Professionalism award. ◆

Photo: DND

Master Corporals Claude Warnet and André Boudreault

On 4 July 2011, MCpls Claude Warnet and André Boudreault were both assigned to 438 Tactical Helicopter Squadron as Avionics instructors. They received a message confirming that a MX-15 *Sensor Suite* was to be sent to them for training purposes at the Field Technical Training Flight. On the message, there was mention that a second MX-15 of the same type would be sent to Khandahar.

When the device was received, there was a modification entry stating that the laser was inactive for training purposes. Despite this, the MCpls decided to wait until the special protective equipment for the camera was available to check the validity of the modification entry.

The test to validate the information was detailed in the manufacturer's instructions, but was not prescribed for a modified device, as military technical instructions did not require an evaluation for modified devices. Once the evaluation was completed, the MCpls concluded that the laser was still active, contrary to the indications listed on the MX-15.

The decision to conduct a full inspection on the equipment before declaring it safe proved to be the right one. The vigilance and professionalism of MCpls Warnet and Boudreault clearly prevented serious injuries to several members of our organization. in recognition of their excellent professional initiative they are most deserving of this For Professionalism award. ◆

Photo: DND

Photo: MCpl Colin Aitken

From the Top

By Lieutenant-General Yvan Blondin, Commander of the Royal Canadian Air Force

Recently, I had the opportunity to address Royal Canadian Air Force (RCAF) and contractor flight safety personnel attending the annual Directorate of Flight Safety (DFS) Training Workshop in Ottawa. I would like to take this opportunity to share with you some of the thoughts I passed on to them regarding force employment and Flight Safety (FS).

Over the past several years the RCAF has been called upon to support multinational coalition operations in and over Afghanistan, Haiti, Libya, the Philippines and Iceland. You, the Air Force team, have driven hard to take on these operational challenges, and you've succeeded despite numerous challenges. As a result, you are recognized both at home and abroad not only for your ability to achieve mission success, which you often do with limited resources, but also for your professionalism and your safety-conscious attitudes.

FS has been and will continue to be one of the first lines of defence in safeguarding our personnel and assets. It is a critical component of the RCAF that I support and this workshop is extremely worthwhile to share lessons, identify and move forward common issues, and preview the new technologies and ideas that will advance aviation safety.

I cannot over-emphasize the CF FS program's relevance within a budget-constrained RCAF. We are headed into a trying year of continued strategic review and debt reduction planning that will reduce operations & maintenance funding and yearly flying rates (YFR) for many fleets. However, we will continue to fully support force generation in order to sustain our manning levels and future operational capability.

We must also keep in mind that the RCAF can be called upon by the government at a moment's notice to respond to a crisis anywhere in the world, often requiring us to surge to the edge of the safe side of the operational envelope. While I expect you to again succeed, I also expect that each of us will come home safely. When the RCAF is preparing to or does respond to the government's call, we need to ensure no one is cutting corners and everyone is adhering to our established rules and regulations. I require that RCAF personnel at all levels remain vigilant and operate in a safe manner.

The acceptance of risk must be done by the proper authority and not by the individual with a can-do attitude. This is fundamental to ensuring that the chain of command is able to set the conditions for mission success. As advisors to the chain of command, the FS team is critical to helping identify those conditions for success.

Thank you for your service, hard work and dedication to Canada. ◆

DFS Comment:

The Comd RCAF comments, both timely and motivational, highlight the importance of Flight Safety regardless of the current budgetary constraints and operational challenges. The CAF Chain of Command is fully supportive of the FS Program and expect honest, un-filtered, advice from the FS Team so conditions for mission success can be fostered at home and abroad. FS is everyone's responsibility! I would like to thank LGen Blondin for attending this important event.

From the Flight Surgeon

Hazardous Substances

By Major Stephen Cooper, Medical Advisor Directorate of Flight Safety, Ottawa

My previous article discussed ways to safely improve your performance. Most of these strategies involve developing and maintaining healthy daily habits; These will improve your ability to interact with the people around you, perform your duties safely, and to get the full enjoyment out of your life. Inversely this article will talk about some UNSAFE choices that a small group of Canadian Armed Forces (CAF) members make every day.

Substance use, abuse and dependence are wide spread in both the Canadian population as well as around the world. Internationally billions of dollars a year are spent to legislate, enforce, punish and treat people who use them because they cause such a great deal of harm to individuals and families. The CAF has strict rules in place to ensure that all members have a safe workplace free from the dangers of people who use hazardous substances.

Photo: DND

Alcohol

Alcohol continues to be one of the most dangerous substances in our society when it is not consumed in moderation. You can confirm this with any police officer, social worker or health care provider. We continue to suffer significant non-battle injuries and deaths because of alcohol and its role in accidents. It disrupts families and relationships and distracts individuals from focussing on completing the mission safely.

Significant legal, administrative and medical resources are dedicated to managing alcohol's adverse effects. The individual is often not aware that alcohol is adversely affecting their health, work performance, the safety of others or the happiness of loved ones.

Even if your co-worker is not legally intoxicated at work, they may be severely impaired from hangover, withdrawal, fatigue from poor sleep, financial crisis and in the case of flying or climbing ladders, poor balance and vestibular impairment.

Substance use, abuse and dependence are wide spread in the Canadian population and around the world.

Illegal Drugs

The use of illegal drugs is not tolerated in the CAF; however, the Canadian Forces Blind Drug Testing Study (2009) showed that 3.7% of CF members tested were positive for marijuana and 0.3% were positive for other illegal drugs (cocaine, heroine etc). People who consume these drugs suffer severe performance degradations immediately after consumption and for several hours afterwards. Additional degradations in human performance can persist for several days afterwards in the form of hangover and withdrawal. The person is unaware of their impaired ability to interact with people, or safely perform duties that they are normally very good at. People who take illegal drugs at any time are incompatible with an organization that is required to operate aircraft safely. Flying and drugs don't mix!

Photo: DND

Anabolic Steroids

It is illegal to purchase or possess anabolic steroids unless it has been prescribed by a physician. They increase physical strength and endurance but health risks associated with them outweigh any benefit.

The actual word "performance" is often misunderstood to refer only to physical strength and endurance. The Canadian Armed Forces requires performance in many other important spheres such as: leadership, teamwork, problem solving, ethical decision making, teaching, and communication. Anabolic steroids does not enhance performance in any of these areas, and their short term use, long term side effects and negative symptoms can adversely affect human performance that is required to safely complete the mission.

Photo: DND

Photo: DND

Over the Counter medications

Ingredients found in common cold remedies cause impairment similar to alcohol. Often these are taken as "night time" medications because of their sedating effects; however performance degradations caused by the medications (and compounded by the actual illness) will persist into the next working day. This increases the risk of in-flight accidents, driving accidents, maintenance accidents and poor judgement in decisions that you make.

Aircrew are forbidden from flying if they are ill and are forbidden to take any medications except for minor muscle pains). If they do take anything other than these they are unfit to fly until they have been cleared by a Flight Surgeon.

Conclusion

Getting the mission done is not enough. It is a requirement to get it done SAFELY. Failure to do so continues to be the leading cause of loss of personnel and equipment. Peoples' unsafe decisions that decrease their performance continue to inflict more damage on our organization than any external enemy.

Working in the CAF is demanding, not always, but the demand comes when we least expect it and being in any state other than your best is when accidents happen. Taking any for form of drugs when not approved can seriously alter your ability to perform at your best. ◆

Maintenance IN FOCUS

Look and Listen, then ACT!

By Master Corporal Douglas Bemister, 450 Tactical Helicopter Squadron, 4th Canadian Division Support Base Petawawa

Photo: MCpl Paul MacGregor

Photo: MCpl Paul MacGregor

A mentor of mine once said, "Listen to the aircraft and it will tell you what's wrong with it!" Was he referring to today's advanced onboard diagnostics and warning systems? No, he was talking about the art of troubleshooting a snag by simply understanding how the aircraft or system works and using the basic senses of sight and sound. The ability to use what you see and hear to find a fault is still valid even in this age of sophisticated monitoring. It reminds me of an incident where the aircraft may have been sending a warning.

The following is my recollection of events leading up to a flight safety occurance involving a CH146 *Griffon* in California in March 2008. I was a fairly new Aviation Technican (AVN) and was on my first deployment as a POM. Three or four days prior to this incident the aircraft had landed in the training area after the crew heard a noise which could not be readily identified. Our crew, consisting of two experienced techs and myself, went out to investigate. I walked around the aircraft looking for anything loose. My attention was drawn to rivets on the aft end of the door which were worn and shiny. I slid the door open and found that the rivets were contacting the door retainer bracket. I pulled in and out on the door and it made a clunking sound. I asked the Flight Engineer if this could be the source of the noise. I mentioned that the door was contacting the retainer bracket but my observations were dismissed. As no one wanted to listen I did not push the issue.

The day before the incident, our crew carried out a 25 hour inspection on the same aircraft.

I advised the tech inspecting the doors to take a good look at the right hand cargo door, but he found nothing wrong.

On March 15th CH146427 lost the right hand cargo door during a routine mission. The cargo door went through the rotors and severely damaged the aircraft. When the call came in, we raced to the scene and found the aircraft heavily damaged but crew safe and sound. When I saw the cargo door missing my mind went to the snag a few days prior with the undetermined buffeting noise.

While the cause was determined to be a result of factors such as airspeed, approach angle and the door retainer pin not being properly engaged, I still to this day wonder if maybe the looseness I found on that day in the training area played a part in the incident.

Maybe I should have pushed the issue more with my Crew Chief and the Level A AVN Tech. If I had written up the cargo door as a snag, then maybe I could have prevented this from happening. I will never know if my action or inaction would have prevented this incident. In the years that have passed I have always kept this experience in the back of my mind when carrying out inspections or troubleshooting snags.

The moral of the story is: when presented with a snag, rely on your senses to help, regardless of rank or experience. Look for the visual cues, listen to the aircraft, and follow through until YOU are satisfied. ◆

Photo: Sgt Paz Quille

Too Many Hands

Author Unknown –
***Flight Comment*, Edition 2, 1977**

An experienced pilot was on his first ride in the right seat (co-pilot) of a C47 *Dakota*. The instructor pilot (IP) demonstrated the takeoff and briefed the new co-pilot on his duties during a closed traffic pattern. The crew completed their before landing checks on downwind and were cleared for a touch-and-go landing.

On Short final, at about 400 feet AGL, the IP asked for a final gear check. The co-pilot complied with a visual thumbs-down signal. Unfortunately, the signal was somewhat overenthusiastic; the co-pilot's swinging left hand struck the right feathering lever and the prop, as advertised, came to attention.

The instructor, feeling the yaw and power loss, slightly advanced both throttles. Assuming they were making a missed approach, the co-pilot asked, "Going around?" Then, presumably overcome by zeal and initiative, he snatched up the landing gear before the startled instructor could say a word!

The IP, realizing he was now committed to a missed approach, applied full power to the left engine and asked the Flight Engineer (FE) to unfeather the right. But by this time, the lack of attention afflicting the co-pilot had begun to spread to other members of the crew. So rather than unfeather the right, the FE smartly reached up and feathered the left.

The IP, now beginning to accumulate glider time, was still unwilling to give up. "Landing gear down," he called – but the co-pilot, not to be outdone be the FE, lowered full flaps instead. Frantically, the IP managed to get the gear down himself just in time to flare the now near silent aircraft smoothly onto the runway. But the right main had not locked completely down, and the aeronautical circus routine finally ended resulting in a folded main gear and damage to the right wingtip and propeller. ◆

Photo: DND

Photo: DND

Photo: DND

One of the Best Pieces of Advice...

By Captain James Lawson, Regional Cadet Support Unit, 17 Wing Winnipeg

The role of the Air Cadet Gliding Program (ACGP) is to provide young cadets with an aviation experience and to train older cadets to Transport Canada Licensing standards. This may seem relatively minor compared to other missions that the military supports, however to the officers who work within the ACGP these missions are dear to their hearts.

With that said, one of the most important decisions that a Gliding Center Supervisor or Gliding School Flight Commander must make is whether or not to push the weather just a little if it allows the cadets to be flown. All aviation is subject to the whims of weather, but gliding is particularly limited to fair weather conditions due to the low crosswind limits of gliders among other considerations. Sometimes this decision can make the difference between a cadet experiencing flight for the first time or being extremely disappointed, and no one ever wants to disappoint a kid.

A few years ago I was the Site Supervisor in Gimli, Manitoba. The weather in Gimli is actually quite predictable; the winds would pick up at 10 am and if it was sunny, you were almost guaranteed to be out of limits by 2 pm. On one particular day the winds were already pretty high as we were doing our morning briefing, the winds were still within limits, so I made the decision to pull the gliders out and get ready for a day of flying. As we walked the gliders out to the field the winds were getting stronger, but as they were straight down the runway I decided to continue as planned. By the time we got all of the aircraft out, the winds were right at the headwind limits of the glider.

I had a big decision to make; push the flying and hope the winds didn't go any further out of limits or cancel flying for the day base on winds that were not yet out of limits. I asked one of my senior staff for some advice, someone who had been a supervisor before at a different site. He said something that will always stick with me,

> *He said something that will always stick with me, "if there was any doubt, then there should be no doubt."*

"if there was any doubt, then there should be no doubt". I mulled on that for a couple of seconds, and then decided that it just was not safe to continue. So, after walking the gliders for almost a mile, we turned around and walked them back. No flying, but to this day I use that piece of advice whenever I go flying. ◆

Photo: DND

Air Cadet Flying Program & Flight Safety...

Photo: DND

By Major Chris Toth, Deputy National Cadet Air Operations Officer, National Defence Headquarters Ottawa

There you are the posted and the newly appointed Wing Flight Safety Officer (WFSO) getting your in-briefing. The litany of terms of references, standard operating procedures and myriad of kit that you need to sign for are located. The desk for which you will fly countless hours in pursuit of flight safety is arranged and finally you take a minute to investigate the fleets and units for which you will be accountable to your applicable Wing Commander.

The familiar is covered: fixed and rotary wing fleets. Maybe you have a maintenance squadron and a movements unit. All seems in order until you get told....

> "By the way, you've also got cadets."

I have responsibility for cadets? What, they fly? Didn't I see one of them fundraising outside the grocery store for the Legion last October? What is that responsibility?

Well, if you take a look at the AGA-135-001/AA-001 *Flight Safety for the Canadian Forces* (AGA-135), Annex A to Chapter 2 its all in the details.

> "The Chief of Defence Staff (CDS) is tasked with operational command and control of the Air Cadet Flying Program (ACGP), specifically all air cadet gliding and powered flight operations, including familiarization flying funded by DND / CAF and the FS program"

So what is this cadet program then? Well it's a National level program run by the Director of Cadets and Junior Canadian Rangers. The program is run under a framework of regulations and standards established by the Royal Canadian Air Force (RCAF) and Transport Canada (TC).

With regard to operations and training, a Standards and Evaluation Team (ACGP SET) is established at 2 Canadian Air Division (2 Cdn Air Div), which provides ACGP oversight and reports to AF Training through the Air Force Air Operations and Training (AF AOT).

As the gliders and tow planes are owned by the Air Cadet League of Canada and are civilian registered aircraft, DND exercises Technical Airworthiness Authority (TAA) over the aircraft in accordance with Transport Canada and DND regulations. This is accomplished through a cell within Director Aerospace Equipment Program Management which is the National Technical Authority for the Air Cadet Gliding Program Aircraft.

As the Operational Airworthiness Authority (OAA) and TAA are administrated by DND, TC has granted legal custody and control of the aircraft to DND, while allowing the aircraft to maintain their civilian registry.

So that's the why. You begin to stew this over and need to see the what.

Region	Region Commander	Designated WFSO
Atlantic	Comd MARLANT	14 Wing Greenwood
Eastern	Comd 2 Cdn Div CA	3 Wing Bagotville
Central	Comd 4 Cdn Div CA	8 Wing Trenton
Northwest	Comd 1 Cdn Air Div	17 Wing Winnipeg
Pacific	Comd MARPAC	19 Wing Comox

From a FS standpoint, the ACGP is a national program delivered in 5 regions across the country. Each region has been assigned an WFSO to advise the applicable region commander for FS as follows (per AGA-135):

Okay, so now you are responsible to advise someone who for the most part is not experienced in air operations (save Northwest) on FS matters for a program that you are not familiar with.

Let's run this down for you. Air cadet aviation relates to the following areas:

- The Air Cadet Gliding Program (ACGP)
- The Air Cadet Power Pilot Program (ACPPS)
- Air Cadet Familiarization Flying

ACGP

The bulk of all air cadet flying is conducted under this program. Here are some facts for you, courtesy of the ACGP standards & evaluation team at 2 Cdn Air Div.

- 5 gliding regions across Canada
- 5 regional cadet air operations offices
- 5 summer gliding schools at 10 locations across the country
- 5 aircraft types
  - Schweizer SZ23 Gliders
  - Bellanca BL28 Scouts
  - Cessna L19 *Bird Dog*
  - Cessna L19 *Superdog*
  - Cessna C182
- 6-week flight training program to achieve glider pilot licence
- 6 maintenance facilities up to depot level
- 15 winches of 3 different types
- 40 new glider instructors licensed every year
- 56 weekend gliding sites (Apr to Oct)
- 80 percent of all glider licences issued in Canada each year
- 107 aircraft owned by the Air Cadet League of Canada and leased by DND exclusively
- 300 licences issued each summer
- 1,300 active pilots aged 16 to 75
- 16,000 average flight hours per year
- 50,000 average glider flights per year

ACPPS

The second program is the training of 255 air cadets each year at contracted flight schools across Canada. These cadets achieve their TC Private Pilots Licences (PPL)in 7 weeks. This is accomplished through a contract with the Air Transportation Association of Canada (ATAC) and the Association québécoise du transport aérien (AQTA). This annual contract ensures that the ATAC/AQTA schools comply with (like any other DND contractor for aerial services) the provisions of the AGA-135. The airspace these cadets flight training varies from sparse traffic to some of the busiest airspace in Canada.

Training fleets vary but cadets train on some of the following aircraft:

- Cessna C-72
- Cessna C-52
- Diamond DA20
- Diamond DA40
- Grob G115
- Piper PA38 *Tomahawk*

Familiarization Flying

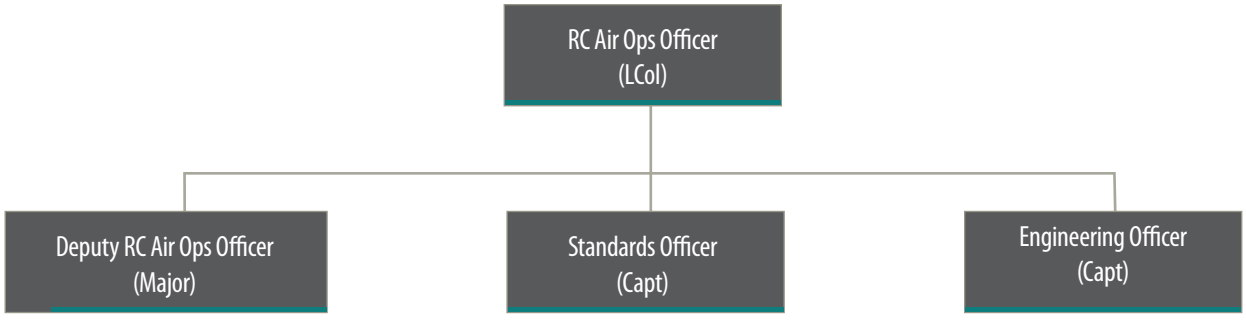
While gliding remains the primary vehicle for cadet flying, some units augment and in some cases, solely use the rental of powered aircraft for familiarization flights. Additionally cadets are flown in privately owned aircraft. In both cases, the flights are governed by applicable orders and regulations to ensure safety and airworthiness of the flights in non-Air Cadet Leagued owned aircraft. The aircraft used vary but are mainly 4-seater general aviation aircraft.

The above flights are also augmented from time to time by the generosity of various RCAF squadrons who fly cadets when operations and resources permit. These valuable opportunities provide Cadets with a snapshot of how operations and flight safety are carried out in the RCAF.

Now before you go frantically trying to get a hold of your career manager, Keep Calm and Read On. . .

There is an imbedded team in each region to help you.

Each of the 5 Regions is staffed with the following at the HQ level.



All of the above positions have a stake in FS and in many cases are FS trained. But wait, there is more:

Per the applicable manual, the A-CR-CCP-242 or *Air Cadet Gliding Program Manual* (ACGPM) there is mandated the following:

> "Each gliding site and RGS shall have a designated person who is responsible for the implementation of a FS Program."

Currently, in some of the regions, this is handled by a Region Flight Safety Officer (RFSO) who is primarily responsible to coordinate all FS actions within the region. Other regions use this as a secondary duty for one of the aforementioned HQ staff. In every region, all gliding sites and the RGS have a UFSO as a minimum.

The ACGP FS trained personnel within the Air Cadet flying program perform many of the WFSO and UFSO functions that would be familiar to the remainder of the RCAF. Additionally the ACGP has some qualified investigators and many FS trained aircrew members available to assist where and when required.

With this program in place, the pieces of the program are there and though there are some occurrences each year, the vast majority are E category. With over 50,000 flights annually and a fleet of its size, this is an enviable safety record to rival any such fleet worldwide.

Being a training system, the ACFP has many of the same FS challenges faced by the rest of the RCAF. It has faced the constant challenge of a high amount of inexperienced aircrew, retirement of senior aircrew (inclusive of annuitants), high operational tempo and resource challenges.

The Way Ahead

The FS program for the cadet flying program didn't just happen. In the beginning, the program relied on regular force staff and transfers from the regular force to aid in initiating the FS program.
The culture and messages; "Flight Safety is Paramount" were indoctinated.

With over 50,000 flights annually and a fleet of its size, this is an enviable safety record to rival any such fleet worldwide.

In the developing stage, Cadet Instructors Cadre (CIC) reserve force officers were increasingly trained on the Flight Safety Officer Course (FSOC) Further mentoring opportunities were carried out and our WFSO's were assisted in their duties by an increasing amount of trained UFSO's. These UFSO's started at the gliding schools and moved to the gliding sites. Annual FS briefings were initiated and further fostered the culture that was beginning to take root. FS moved from the way we have to do business because we're being ordered, to this is a way to do business better.

In the maturing stage of the program, there is now CIC officers attending the FSC. This experience gives them the knowledge in FS as any RCAF member would recieve. The gliding centre/site UFSO is augmented by, in some regions RFSOs who assist in guiding ACFP flying operations FS requirements. Regular FS briefings by DFS are complimented by Cadet Regional or Gliding School staff briefings and FS meetings.. More and more investigations are carried out by qualified staff. This leads to more relevant preventive measures that make the program safer for all.

So, intrepid newly posted WFSO, fret ye not. For though you have gained responsibility for cadets, you have also introduced yourself to a team of colleagues there to assist you. They are here to help accomplish the mission at an acceptable and mitigated risk. Plus, you get to help influence a young person to have a lifelong appreciation for aviation. What a great day at the office! ◆

Photo: MCpl Gary Andrews

Construction Engineer Capabilities for Airfield Assessment and Repair

By Captain Josh Van Tine and Captain James Boone, 1 Canadian Air Division, 17 Wing Winnipeg

Capt Van Tine is responsible for coordinating the deployment of Airfield Surface Assessment and Reconnaissance (ASAR) teams and Capt Boone is responsible for coordinating the instruction of Airfield Light Repair (ALR) teams.

Airfield Surface Assessment and Reconnaissance (ASAR)

Introduction

While the Construction Engineering (CE) branch has always maintained a robust capacity to technically evaluate airfield suitability for various Royal Canadian Air Force airframes, this expertise was previously limited to DND civilian personnel. The limits of this capacity became evident following the earthquake in Haiti in 2010 during Op HESTIA when the Constr Engrs were called upon to evaluate Jacmel airfield for CC130 suitability in order to establish the main Canadian camp out of this airfield. As no Canadian Armed Forces (CAF) members were trained to perform this task, the Commander 1 Canadian Air Division (1 CAD) relied upon his civilian staff, namely Mr Ray Clement, to deploy and perform these assessments. Upon the completion of this operation, this capability deficiency was evident, as well as the requirement for a trained military team to deploy and assess the technical capacity of airfields anywhere in the world.

Aim

The aim of the ASAR team is to perform an assessment of the selected airfield for specific airframes and provide a detailed technical report and recommendation within a relatively short timeframe (assessment usually within 12-48 hrs from arriving on ground, and report and recommendations usually within 48-96 hrs of arriving on ground).

Team Composition

The standard ASAR team consists of 4 personnel: one team leader and three team members. The team leader is a Lt/Capt Constr Engr, and the team consists of Qualification level (QL)6A Constr Technician Sgt/MCpl, a QL5A Electrical Distribution Technician or Electrical Generating Systems Technician MCpl/Cpl and a QL5A MCpl/Cpl of any CE trade. At any time there are a min of 3 trained ASAR teams on a 12 month High Readiness (HR) posture, which is synchronized with the RCAF Managed Readiness Plan.

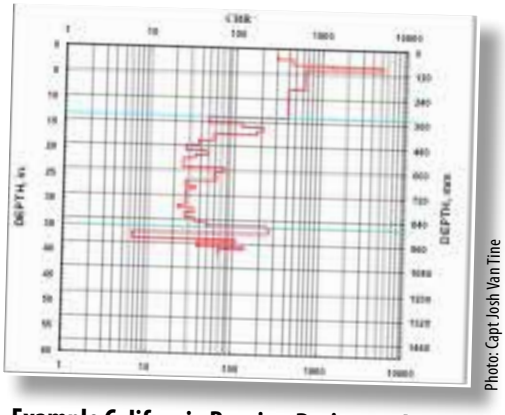


Photo: Capt Josh Van Tine

Example California Bearing Ratio graph used to assess soil strength

> *While the CE branch has always maintained a robust capacity to technically evaluate airfield suitability for various RCAF airframes, this expertise was previously limited to DND civilian personnel.*

Photo: Capt Josh Van Tine

ASAR students, Lt Ledoux and WO King, conducting DCP testing

Photo: Capt Josh Van Tine

ASAR students Sgt Hebb, Cpl Fischer and MCpl Keirstead conducting runway surveying

Photo: Capt Josh Van Tine

Example of an airfield distress encountered on an overseas airfield

In addition, there is a database of no less than 24 current ASAR trained regular force members which can be drawn upon to create additional ASAR teams.

Training

ASAR initial training is currently conducted at least annually at 4 Construction Engineer Squadron (CES), Cold Lake, with a duration of approximately 10 days in length. All members of the team, including the team leader, receive the same basic technical training on the various aspects of assessing a runway (surveying, using a Dynamic Cone Penetrometer, checking for impedances to the Obstacle Limitation Surface (OLS), assessing the runway for Pavement Condition Index (PCI)). The team leader also receives additional training on report preparation and coordinating the efforts of the team with airport authorities and flight crews. Once trained, teams remain current for 3 years, unless they perform an operational assessment or attend refresher training within that time period.

Equipment

As the teams have very specific technical equipment requirements that cannot be hastily gathered together when a deployment is required, pre-packaged kits are pre-positioned containing all of the required equipment and are stored and maintained in key locations. Currently, there is 1 deployable kit kept in Trenton, 1 deployable kit which will be kept at 2 Wing, Bagotville, and three training kits located at 4 CES in Cold Lake. Some of the key pieces of engineering equipment in these kits are items such as the Dynamic Cone Penetrometer (DCP) (used to measure the shear strength of soils), Clinometer (used to measure angles to impedances within the Obstacle Limitation Surface), Optical Survey Level (precision survey eqpt used to measure elevations and distances), Laser range finder, measuring wheel and soil sample kits.

Capabilities

The ASAR team has the capacity to evaluate the following aspects of an aerodrome:

- Confirm/measure the geometric dimensions of the airfield (length/width of components).
- Identify breaches of the Obstacle Limitation Surface (OLS).
- Identify a suitable Minimum Operating Strip (MOS) for an airframe, within the overall airfield.
- Evaluate pavement and soil strength for various airframes, and can be given in terms of a California Bearing Ration (CBR), a Pavement Classification Number (PCN), Allowable Gross Load (for a given number of passes), or allowable passes (for a given gross load of the airframe).
- Evaluate the roughness and slope of the airfield to ensure that the maximum transverse or longitudinal slopes are not exceeded for an airframe and that the

Since the inception of the ASAR concept, teams have conducted a total of 6 assessments; 3 overseas and 3 in Canada's North.

Boeing Bump criteria are adhered to.

- Identify and map critical airfield distresses as well as determine the Pavement Condition Index (PCI).
- Identify and assess NAVAIDs.

Role in Flying Operations

During deliberate operations, ASAR teams are ideally employed to assess an airfield, or multiple airfields, in the initial planning stages of an operation if the suitability of that airfield for a specific airframe is uncertain. During contingency operations, ASAR teams are usually employed as early as possible in the planning process, as the teams may require from 24-96 hrs to coordinate the logistical movements of personnel from their home bases to the assessment sites. Once the decision has been made to deploy an ASAR team, the team leader will usually establish contact with the deploying flying squadron that has the airframe with the highest Aircraft Classification Number (ACN) for the operation in order to work with this unit to determine the criteria that must be evaluated for (estimated gross load of aircraft, tire pressures, estimated number of passes, etc).

Recent Assessments

Since the inception of the ASAR concept, teams have conducted a total of 6 assessments, 3 overseas and 3 in Canada's North (Cambridge Bay, NU, Hall Beach, NU, and Peawanuck, ON). The most recent assessments were of Cambridge Bay, NU (25-29 June 2013) and Hall Beach, NU (3 - 5 July 2013).

Role in the Flight Safety Program

The ASAR assessment plays a significant role in assuring a safe landing and takeoff by flight crews, in the following manners:

- Ensuring a Minimum Air Operating Surface (MAOS) ensures airframes have sufficient length and width land, taxi, park and take off safely.
- Adherence to the Boeing Bump Criteria ensures that the plane's landing gear can withstand transiting the different sections of the airfield.
- Identified impedances on the Obstacle Limitation Surface (OLS) are published as NOTAMs.
- Pavement and soil strength evaluations ensure that aircraft don't rut or "punch through" the airfield.
- Slope evaluation and obstacle identification prevent clearance issues and potential contact of the airframes.
- Identifying critical airfield distress can reduce the FOD potential.
- Assessment of NAVAIDs can determine if air ops can occur during night time or reduced visibility.

Airfield Light Repair (ALR)

Introduction

Airfield Damage Repair (ADR) is based on NATO STANAG 2929 Airfield Damage Repair Capability standards which allow nations to determine and establish their own ADR capability regarding expediency, size and complexity.

Based on experiences over the past 30 years including recent operations in Afghanistan and Haiti, the RCAF is likely to encounter airfield damage from indirect fire munitions (rockets) and damage from natural deterioration. Therefore, the RCAF modernized its ADR program addressing these types of anticipated damages. This modernization encompasses the previously mentioned ASAR capability and Airfield light repair (ALR).

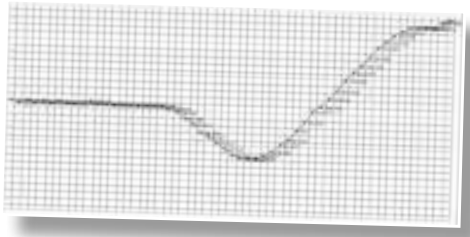


Photo: Capt Josh Van Tine

Longitudinal runway profile of theCambridge Bay Runway

Photo: Capt Josh Van Tine

Members of the 8 Wing ASAR team drilling through an impenetrable layer of gravel on the Cambridge Bay runway

Photo: Capt Josh Van Tine

Example of "punch through" where the pavement structure was insufficient to support the airframe

Photo: Capt Josh Van Tine

Example of typical airfield distress encountered

Photo: Capt Josh Van Tine

ALR Team candidate Capt Dumont removing material from the patch location

Aim

The aim of the ALR team is to conduct necessary repairs to the airfield within a relatively short timeframe (timeframe dependant on air operations, priority usually resting with the Minimum operating Strip (MOS), then the remainder of the Minimum Airfield Operating surfaces (MAOS).

The standard ALR team consists of 5 personnel: one team leader and four team members. The team leader is MCpl/ Sgt Construction Tech QL6A qualified, and the team consists of an additional Construction Tech QL5 qualified, and three QL 5 tradespersons of any engineering trade. At any given time there will be two trained teams with one being on high readiness (HR) posture which is synchronized with the RCAF Managed Readiness Plan (MRP). The ALR qualification does not expire; however it is a HR requirement to be retrained each time the CEF goes on HR.

Training

ALR initial training will be conducted annually at 4 CES, Cold Lake, with duration of approximately 5 days in length. All members of the team, including the team leader, receive the same technical training on the concepts, tool techniques, best practices, industry standards, and the proper methods of repairing asphalt and concrete surfaces. Since there is no current training in the CAF in asphalt surface repairs, this will be the first time many of these tradespersons will be exposed to asphalt material. Once trained, teams remain current until they are cycled through the HR process.

As the teams have very specific technical equipment requirements that cannot be hastily gathered together when a deployment is required, pre-packaged kits are pre-positioned at 4 CES ready to be deployed. Currently, there

is 1 deployable kit kept in 4 CES Cold Lake, and one training kits located at 4 CES in Cold Lake, AB. Key pieces of engineering equipment in these kits include an Asphalt recycler, Hot pour Kettle, Skidsteer attachments for concrete and asphalt resurfacing, and necessary power and hand tools to complete the repairs.

Capabilities

The ALR team is required to repair the following capacity in both asphalt and concrete:

- Spall repair up to 2.25m^2 totalling 10m^2/day;
- Crack and Joint sealing up to 375 m/ day

Currently this capability is under development and will be ready for implementation with the pilot course starting summer of 2014. This course will consist of the 31 Cronstruction Engineer Flight on it's road to high readiness.

Photo: Capt Josh Van Tine

Course member WO McKay being instructed by 4 WCE Roads and Grounds personnel in proper techniques to fill concrete patches

Photo: Capt Josh Van Tine

The Image Tech

By Corporal Daisy Hiebert, DFS 3-3-2 Image Technician, Directorate of Flight Safety, Ottawa

Image technicians, in general are not trained on what to do if there is an aircraft accident investigation. We are trained on individual aspects of general photography that can be applied universally. For example, how to photograph vehicle accident, images of small parts and other basic photographic techniques. In this article I will explain some of the nuances of photographing an aircraft incident.

Being a part of an aircraft accident investigation can be very chaotic, so you need to have your equipment ready prior to arriving at the site (I mentioned how to prepare your equipment in the previous issue).

That doesn't only include your camera kit; depending on the severity of the accident you may also require PP&E, consisting of air filtration masks, gloves and coveralls. Here is an example of a camera kit to have packed for such a situation:

- 2 camera bodies
- 24-80 mm lens
- 60mm macro lens
- 16mm wide angle lens
- 50 mm
- 2 flashes
- ring flash
- micro flash
- TTL cord
- spare batteries
- 2 chargers
- multiple small Gb memory cards
- smaller camera bag for onsite
- tripod mini
- ruler
- white paper for reflecting

This list may seem extensive; however it will cover a wide variety of possible incidents or situations that you may be called to photograph.

The importance of images to an investigation cannot be stressed enough. It is easier and more convenient to go over the scene if the investigators can access high quality images. More often than not, circumstances beyond our control, like weather, can alter the scene and deplete evidence, hence the importance of the taking images as soon as possible. Investigations can take months, even years before they are closed, so being able to look back at the scene without being at the scene is much more practical.

Skills that are useful on scene are those similar to the skills required to photographically cover a vehicle accident, as a rule, start from the outside in. If there are fatalities or human remains involved; that is the first priority. Next is to focus on skid marks, damaged surroundings, overall start from outside and work your way in. If possible try and get aerial images on the crash scene. It helps the investigators to have a general idea where all of the pieces of the aircraft are. Some specific images of the aircraft include:

Photo: Capt Josh Van Tine

- All major parts of the aircraft.
- Detailed view of the cockpit, instrument panels, switch settings and control handles
- Engine and propellers
- Wheels and landing gear assembly
- Structural failure
- Any failed parts

It is important to keep a log of the images, a picture of a random burnt piece of metal doesn't help the investigators unless it has context. Once the overall images have been taken, the investigators will take apart and

While it is important to have the proper equipment at an aircraft accident as a photographer, competency is by far the foremost item you should bring.

remove pieces from the scene. Where the pieces were removed will also need to be photographed. All serial numbers need to be photographed. The serial number must take up the entire image, be properly lit and readable. This will help the investigators know what kind of maintenance was done on that part. Hence point and shoot or cell phone cameras are fine in a pinch but are discouraged. Single lens reflex (SLR) cameras are preferred because of the quality and control that they offer. With an SLR you are able to get high resolution images. The combination of an SLR and a 60mm macro lens can get details when zoomed in on afterwards, which a point and shoot can not obtain. Flash on a scene is one of the most important pieces of kit to have on hand. TTL cord will get light into small awkward spaces. Isuggest using a fill flash generiously in these situations. The investigators need to be able to look in the shadows. Reflectors and flash are very important. A lot of the times pieces of the aircraft and Aviation Life Support Equipment (ALSE) will be removed and photographed in a controlled environment. Images of the ALSE can help determine for the investigators report

Documenting the scene is your primary duty on site. Depending on the severity of the incident you may have other duties. If it is a serious incident you will not only be taking and logging the images but also be helping out where you can. Running messages and fetching items to name a few. The days can be very long.

Once the images have been taken what do you do with them? First have a catalogue system. It could be by day and/or part of a scene. Pick a system and stick to it. Unlike shooting a portrait there is very little you do with the image after. Do not rename the images. Avoid cropping or altering the image in any way. IPTC is not something that is always needed with these types of images because they won't be archived in with images you take on a daily basis. This is why it is important to have a log of the images. Before taking images make sure that the date and time are correct in the camera.

While it is important to have the proper equipment at an aircraft accident as a photographer, competency is by far the foremost item you should bring. The investigators will not have time or the patience when an incident happens. Everyone has their jobs and need to be able to perform under stress. This is a very quick and general synopsis of flight safety photography. Each incident is different. Properly exposed and in focus images are an essential part of the investigation process. ◆

Photograph without flash

Photos: Capt Josh Van Tine

Photograph with flash

ON TRACK

Non-assessed IFR Airfield Departure

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.

By Captain Braden Buczkowski, ICP Instructor, ICP School Winnipeg

This quarter's question comes from many a bad weather day discussion:

How can an aircraft safely depart IFR from an uncontrolled aerodrome that is labelled as Not Assessed and has no published departure procedure?

The answer comes from Captain Braden Buczkowski, ICP Instructor and HPMA Course Director:

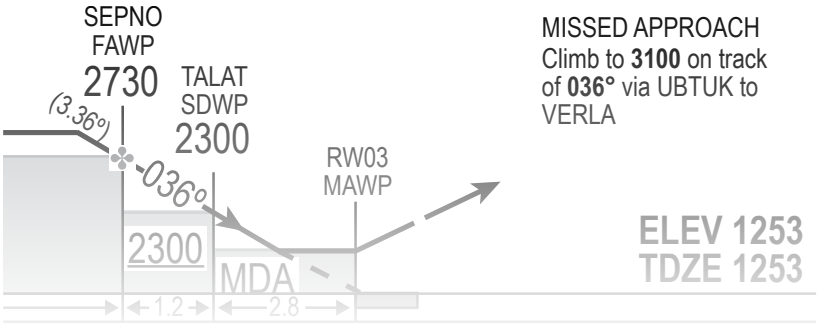
The question from the last issue talked about departure routings and procedures from a controlled aerodrome. However, there are runways in Canada that have still not been assessed for IFR departures. In these cases, the responsibility for terrain and obstacle clearance rests solely with the pilot. So how exactly does one depart safely in Instrument Meteorological Conditions (IMC) when there is no assessed departure procedure from that runway?

The answer is simple: it depends. If conditions are Visual Meteorological Conditions (VMC), then departing is simple. The goal is to reach a safe IFR altitude that will allow the aircraft to proceed to the next destination, and if there is no weather to contend with, then the see and avoid principle applies. But what if conditions do not permit a visual climb to the enroute altitude?

If the aerodrome has a published instrument approach available then there are a couple of scenarios to consider. One option could be to take off and fly the published approach backwards. It works for landing so it should provide suitable obstacle clearance. But this technique requires converting the applicable descent gradient for each segment of the approach into a corresponding climb gradient for the departure. These can be up to 400 feet per nautical mile. The example below requires a climb gradient of 374 feet per nautical mile from the runway to 2300 feet.

Any pilot attempting to reverse-fly an instrument approach with the aim of turning it into a departure procedure may ultimately be successful, but the risk could be significant. We must also consider an engine failure shortly after becoming airborne.

The goal is to reach a safe IFR altitude that will allow the aircraft to proceed to the next destination, and if there is no weather to contend with, then the see and avoid principle applies.



Unless it can be determined that the minimum altitudes of the procedure can be attained during the climb out with one engine inoperative, the above mentioned technique, while not expressly prohibited, should definitely not be attempted or even considered. In addition, it would be crucial to ensure the aircraft is at the appropriate minimum altitude shortly after getting airborne in order to safely commence the procedure. Is all this possible? Perhaps, however there is a safer and more familiar option available.

The lowest altitudes published for an approach that the aircraft can fly while manoeuvring to land are the Circling Minimums. Our suggestion is that the aircraft take off and climb visually over the airport while remaining within the circling airspace. The pilot could then position the aircraft to conduct the published missed approach procedure. Obviously, in mountainous terrain where circling minimums are higher, the ceiling would need to be higher as well and any circling restrictions would need to be adhered to. The benefit of this technique is that the pilot remains within sight of the runway and within protected circling airspace, for whatever time period is desired. The missed approach procedure would then be conducted when the aircraft is in the desired position, i.e. the missed approach point. This is certainly the safer and easier of the two options as there are virtually no calculations required and the pilot already knows how to fly a published missed approach.

The pilot could then position the aircraft to conduct the published missed approach procedure.

Of note, the United States Air Force prohibits its pilots from departing a non-assessed runway when the weather is IMC, regardless of the climb performance of the aircraft. They have determined that the risk is too great.

Here in Canada, our RCAF pilots have been granted less restrictive regulations and we all know that flexibility is the key to air power. However we need to be smart about it. When it comes to risk mitigation, the pilot and crew must have a plan that is safe and well thought out. ◆

CATEGORY	A	B	C	D
LNAV / VNAV	NOT AUTHORIZED			
LNAV	**1980** (727) 1 ¾			
CIRCLING	**1980** (727) 2 ¼		**2000** (747) 2 ¼	

Mentorship

By Major Frank Cannon, Deputy Commandant 3 Canadian Forces Flying Training School, Portage La Prairie

Photo: Sgt Gerry Antle

I got the following in a fortune cookie a couple months back;

"Someone is looking up to you. Don't let that person down."

I stuck it to the cupboard above my computer and periodically find myself reflecting on its meaning. Of the numerous situations where this phrase is applicable, the one that kept returning to me has to do with my role as a supervisor in the RCAF. This led me to ponder a pet peeve of mine, "mentorship", or more so, the lack of it at some of our units.

Mentorship is a key component of a professional organization. It is often defined as a personal developmental relationship where a more experienced person helps to guide a less experienced person. To be effective, mentoring needs to go beyond the answering of occasional questions or providing help on a random basis. It needs to be an ongoing informal relationship of open and frank discussion, which leads to increased opportunities for development in order to expand the protégées knowledge base. In my opinion, it is our responsibility to take the experience that the RCAF has paid for and use it to assist junior personnel in their development. Let's face it; today's new guys aren't going to get near the exposure some of us got when we were in their shoes. How can we expect them to progress rapidly without having the opportunities to see it all? You can't just say, "Sit back, relax and watch the ideal.". . .the opportunities aren't there anymore, or at least not as often.

Training opportunities don't always need to occur in the simulator or on an airplane. Some of the best information exchanges I have ever been involved with occur when just sitting around and shooting the. . .breeze. People are relaxed and personal stories stimulate further discussion. What pilot doesn't like to talk about himself/herself or their exploits? The junior aviators soak it up and the informal setting encourages them to ask questions. Having a group around also gives different viewpoints on single subjects, allowing the less experienced person to see things from different angles.

> *You can't just say, "Sit back, relax and watch the ideal." . . . the opportunities aren't there anymore, or at least not as often.*

When I hear about someone who is struggling on a unit, unable to upgrade or get a handle on operational procedures my first question is to wonder what the unit's mentoring program is like. This seems to be happening more often as training opportunities are reduced on

the aircraft. When the students go through training they are closely monitored and constantly provided feedback. This feedback isn't always about what they are doing wrong, but includes a lot of guidance and coaching on how to do better. Some individuals really need this type of feedback regularly to assist them in their development. If they aren't getting it a roadblock begins to form which starts to impede their progress. We need to identify these persons early in their tours so that we can provide them with the right assistance they need at the right time.

Most units identify a sponsor for personnel newly posted into that unit. The idea is that this sponsor will help the new individual acclimatize into the unit. This is especially important for someone coming onto their first operational tour and has never experienced the RCAF outside of the training environment. Instead of a sponsor, which tends to end once the new guy is checked out, units should consider assigning a mentor.

> *"Training opportunities don't always need to occur in the simulator or on an airplane."*

It behoves us to take our experiences and, by sharing them openly, give back to the community which has given us so much. Us old guys should be actively seeking opportunities to talk about how great we are! ◆

Photo: MCpl Dan Mallette

Photo: Cpl Jonathon Wilson

Photo: DND

How Urgent is Your Emergency?

By Major Bruno Castonguay, 438 Tactical Helicopter Squadron, St-Hubert

When we hear "emergency" we tend to shift in high gear and our sense of urgency increases accordingly. In some cases, however, a precipitated action is not the best response.

Case in point: While on my first exercise in Germany flying the CH136 *Kiowa* helicopter, I got a "chip" indication. Lacking experience and a crew to rely on, the only thought that came to mind was to land rapidly. After all this is the way it had been practiced over and over during training; and so I did, I landed on the first open field that I could see.

The issue with this reaction was that the ground was not like the flat expanse of the prairies that I had trained in, but rather a rolling landscape of mixed fields, trees and villages. The result was an 8 to 10 degree nose up landing on a soft and recently tilled field. Not an uncommon position in itself but not really ideal for a shutdown. After the techs determined the chip as a nuisance occurrence and I was cleared to start and leave, the heels of the skids had partly sunken in and the tail rotor was that much closer to the ground.

Although I was able to start and take off without incident, I made a conscience effort to reflect on my emergency response. Had I taken 30 seconds more and flown a few hundred meters further, I would have been able to find a much more appropriate spot to land without compromising safety. It would have been safer, easier and more practical had the repairs been needed.

35 years later, I am relieved to find that we talk progressively more about emergency response and the importance of decision making, versus automatic reaction requirements for different emergencies. Unless the aircraft is failing or is about to fall out of the sky, it is generally better to take a pause before blindly reacting and potentially making things worse. ◆

How Far to "Push?"

By Captain Daniel Fisher, 413 Transport and Rescue Squadron, 14 Wing Greenwood

Often times in Search & Rescue (SAR) we, the aircrew, find ourselves faced with the question of how far to push a mission. Sometimes it's a very easy and obvious call to make, but other times, the right decision is not so obvious. Having the ability to "armchair quarterback" a mission or analyze a decision in hindsight is a luxury we are never afforded. Just how far a person or particular crew decides to push a mission depends on a number of factors. I would like to present a scenario below as an example of such a mission.

On this particular day, the standby crews of both a CC130 *Hercules* and a CH149 *Cormorant* from 14 Wing Greenwood NS were tasked on a SAR mission to locate two overdue hunters thought to be about 80nm northeast of Kuujuaq, QC. My crew and I were to board the CC130 *Hercules* for transport direct to Schefferville, QC where we would be on the ground for a few hours while another crew ferried the aircraft to our location. We would then take the *Cormorant* to Kuujuaq for fuel before proceeding to the assigned search area under night VFR conditions.

With a plan in place we took on fuel and departed out of Kuujuaq at approximately 0300hrs. Our crew day had started at 1600hrs the previous afternoon and, although most of the crew had been up since that morning the departure was uneventful; checks were carried out as per norm, including the ditching drill (which detailed the crew responsibilities in the event of an emergency over water). The route would take us over water approximately 10nm from shore, it was decided that this route provided the best balance between timeliness and safety.

At approximately 40nm from Kuujuaq, we encountered a Master Caution light for a Main Gearbox (MGB) Chip, meaning that the system which detects metal filings was picking up something (worst case, it could be indicative of a MGB failure). In a helicopter, the MGB is a critical piece of kit - one might argue that its importance falls somewhere in between the wings and engines of a Flight Worthy aircraft. As the pilot, I immediately turned direct for the shoreline while the Aircraft Commander (AC) and the Flight Engineer handled the checklist for the emergency. Once the Flight Reference Card (FRC) was carried out, options for continuing the flight were discussed. As the AC was monitoring the number of "chips" present in the detection system, (indicating, but stable. i.e. the count was not increasing) and there were no secondary indications (temperatures and pressures normal and stable). It was decided, after serious thought and crew discussion about the implications and consequences, to carry on with the mission with a specific caveat: if the chip count increased even by 1, we would turn around and return to Kuujuaq. The crew agreed that this sounded reasonable and we "pushed". Approximately two minutes later, the chip count increased by 2. Although we had set our turn around point as: "if we get one more," again, we decided to "push" even though the count had increased, the situation was still stable with no secondary indications. Another two minutes goes by and the chip count again increased by 2. At this point, we all agreed enough was enough and returned to Kuujuaq following the shoreline to ensure the ability to land should the situation take a turn for the worse. During the flight back we accumulated approximately 6 more chips. We landed safely and went to ground in Kuujuaq. The mission was suspended until the aircraft could be inspected to determine the cause.

In the end, the aircraft was inspected and the ground run deemed it serviceable, another crew was flown in to complete the mission. Although the decisions made didn't end up contributing to the success of our mission they highlighted for me, as a junior officer, the importance of taking in all available information and making timely decisions, when it comes to managing risk. In hindsight, I don't believe we made the wrong decision or the right one. We did, however, consider all the implications we could think of when making the decision to push and made that decision based on the safety of the crew, helicopter and a keen eye towards completing the mission. ◆

Photo: Sgt Rick Ruthven

Photo: Cpl Nedia Coutinho

Worth the Risk?

By Captain Christopher Kublik, Aerospace Engineering Test Establishment, 4 Wing Cold Lake

One week into Exercise RIMPAC, the world's largest international maritime warfare exercise, the HMCS Algonquin was preparing for a Combined Anti-Submarine Exercise (CASEX) against the USS Bremerton. Although the ship and HELAIR detachment had conducted several such exercises before, this one was particularly significant. This CASEX was to be conducted using real torpedoes (albeit exTorps) against a Los Angeles Class submarine. As a junior Tactical Coordinator (TACCO), this was my first opportunity to both track a live submarine and drop a non-simulated torpedo. The CASEX was considered a highly valuable event by the Air Det and I was scheduled to fly both sorties to maximize my training.

In the days leading up to the CASEX, both crews observed forward fuel boost pump failure lights that flickered occasionally when the pilots pulled moderate to high torque loads. While this was unusual, it was occurring very rarely and everyone agreed to monitor the issue to see if it worsened – we *"needed"* a serviceable aircraft for the exercise.

On the day of the exercise we launched heavy, carrying a torpedo and plenty of fuel. Initially, the boost pump lights flickered similar to the previous days but would always go out immediately. Each time we discussed the light as a crew, and each time we elected to continue with the exercise. As the sortie progressed, we became more focused on tracking the submarine and less concerned with the increasingly occurring boost pump lights. Half-way through the exercise we returned to the ship, completed a crew change, and re-fuelled before quickly rejoining the search – after all, we still hadn't dropped the torpedo. Similar to the first sortie, the boost pump lights were initially intermittent and we quickly turned our attention to tracking the submarine. By the time we dropped the torpedo and returned to the ship, the boost pump lights were almost steady and we had minimum fuel.

When the technicians opened the fuel cells to investigate, they discovered the remnants of an absorbent pad completely shrouding the ejector pump and significant debris throughout. While the fuel cell FOD (Foreign Object Debris) was a serious Flight Safety incident on its own, the entire experience highlighted to me how subtle it is for perceived pressure to influence safety of flight decisions. Had there not been the upcoming CASEX, the aircrew and technicians may have investigated the boost-pump lights earlier; had the final flight been a standard training mission, vice a CASEX, the second sortie may have been cancelled; had we not been chasing a submarine, we may not have flown to minimum fuel levels with cells filled with debris. This situation definitely left us to reflect on the question; was the training accomplished worth the risk? ◆

Home-itis

By Major Jean Leroux, 103 Search & Rescue Squadron, 9 Wing Gander

Rules are made to be followed! Rules are engineered by knowledgeable people that have the time to analyze and calculate risk in a specific context. One rule in our regulations stipulates that a Search & Rescue (SAR) crew day is max 15 hours long extendable to 18 at the aircraft commander's discretion for SAR purposes. I made the mistake last summer to stretch my crew day to the limit for the sole benefit of getting home that night. I was a victim of the sneaky and insidious home-itis syndrome.

It was on a beautiful day on Vancouver Island that I was loading the helicopter with SAR gear for my day on standby. We flew all day training in the vicinity of Vancouver, we conducted boat hoist sequences and land based scenarios. It was a full day at work when we landed back home 15 minutes before our day was over. Just before I release my crew I received a call from the Joint Rescue Coordination Centre about a possible missing plane in Jasper, Alberta. I gathered the information, briefed my crew, accepted the mission and took off again in what would become my longest day of flying in my career.

We reached Jasper three hours later; we conducted an electronic search with no success and landed at Valemont BC to re-assess our plan. During re-fueling we received new information on a fire sighting in the vicinity of our search area. We took off and got on scene to discover that it was in fact the downed aircraft that we were looking for. We inserted our two SAR TECH's to the crash site and we completed the extraction of the victim. We then flew to Valemont for the transfer of our casualty with the ambulance services. When everything was done and completed it was around 2145. It was still daylight and we were on the high energy state of the mission when I made the decision to return home, I was feeling good. It was Friday and everybody on the crew had plans for the week end. The rest of my crew didn't question my decision and we started to make our way back. We were two hours away from the base when night time settled in. My co-pilot and I donned our night vision goggles and started to feel the effects of fatigue. The entire back end crew was now sound asleep and the cockpit was getting quiet. When we were about one hour away from the base we encountered un-forecasted cloud and we had to revert to IFR flying. We were now at hour 16 of our crew day, what seemed to be a great decision a couple hours earlier was now a burden to the safety of my crew. We landed safely with no major issues but both realized that we were operating at a great level of fatigue and that we had to fight an enemy that we created ourselves with no valid reason.

The entire crew agreed that we made a poor decision and that hopefully if the situation arises in the future a crewmember will be able to relate to our experience and recognize the symptoms of home-itis and raise the red flag. ◆

Photo: Cpl Crystal Roche

Epilogue

TYPE: Twin Otter CC138804
LOCATION: 74 NM SW of Inuvik NWT
DATE: 23 August 2012

While conducting austere airfield training, during the takeoff from the tundra near Horn Lake, southwest of Inuvik, NT, the CC138 *Twin Otter* aircraft's nose landing gear collapsed. There were no injuries among the four crew and two passengers.

After arriving at the austere landing site, the crew evaluated it for suitability of use. Following several recconnaisance passes and a cautious light weight-on-wheels drag manoeuvre, the crew determined the terrain to be rough but suitable and so they conducted a full stop landing. An inspection of the landing area then indicated that the surface was covered with water-saturated tundra hummocks between which the wheels had sunk into. Tundra hummocks are small mounds of soil and vegetation related to the permafrost.

During the takeoff attempt, the aircraft stuck fast even with the application of full power. The crew then shut the aircraft down, dug out the hummocks in front of each wheel and inserted plywood ramps to facilitate rolling the aircraft over their tops. Although this proved to be effective, during the takeoff roll just as the aircraft was approaching flying speed the nose wheel sunk into soft ground, shearing the nose landing gear strut above the wheel yoke. The nose then dropped to the ground and the aircraft skidded forward, sustaining serious damage, as the crew aborted the takeoff.

Although following procedure, the crew was unable to detect the presence of the saturated hummocks prior to landing. The investigation's recommendations, therefore, focussed on improving the evaluation criteria during the aerial reconnaissance and drag manoeuvre. ◆

Epilogue

TYPE: Cormorant CH149910
LOCATION: 103 SAR Sqn, 9 Wing, Gander, NL
DATE: 28 July 2009

The CH149 *Cormorant* landed in Port au Choix, NL, after a three-hour training flight. A significant amount of oil was discovered on the right side of the aircraft in the vicinity of the no. 3 engine. After discussion between the crew and maintenance personnel, the affected area was cleaned, the engine was replenished with oil, and a ground run was conducted. On the return flight to Gander, oil was again seen leaking along the right side from the vicinity of the no. 3 engine, which led the crew to shut it down in flight before they safely landed at Gander.

After a no. 3 engine change, the ground run and maintenance test flight (MTF) proceeded as planned with no abnormalities; however, during towing the aircraft into the hangar, oil was once again noticed on the right side. Initial inspection revealed a considerable amount of oil near the connecting intermediate transmission casing forward of the no. 3 engine bay. Further inspection revealed a crack approximately 340 mm (13.5 inches) in length, extending approximately halfway around the no. 3 intermediate case outboard flange, a component of the main gearbox (MGB).

The investigation determined that the intermediate case had failed due to high cycle fatigue, attributed primarily to a design deficiency that did not account for loads induced by a complex airframe vibration. Secondary factors in the initiation and propagation of the crack were related to the casting process that affected the case's fatigue resistance. Recommendations were made relating to redesign of the intermediate case and review of MGB manufacturing specifications and quality control. The original equipment manufacturer has since redesigned the intermediate case; implementation of this modification is under review.

The investigation also found that oil leak troubleshooting initially focussed on the engine to the exclusion of other sources, allowing flight to continue with a structurally weakened MGB and exposing the crew to significant risk. Recommendations were made relating to improvement of CH149 fault finding and oil quantity monitoring procedures in order to better detect leaks. ◆

Air Cadet Gli
Operationa

PACIFIC REGION

12 SCHWEIZER 2-33A GLIDER

3 CESSNA L-19

3 CESSNA C182

Gliding Sites-
- Prince George BC
- Abbotsford BC
- Langley BC
- Pitt Meadows BC
- Nanaimo BC
- Comox BC
- Oliver BC

Deployments-
- Hope BC
- Port Alberni BC
- Smithers BC
- Cranbrook BC
- Trail BC
- Salmon Arm BC
- Sparwood BC
- Creston BC
- Grand Forks BC

Region Cadet Air Operations Officer - 19 Wing Comox BC
Aircraft Maintenance Facility - 19 Wing Comox BC
Regional Gliding School (PAC) - 19 Wing Comox BC

NORTHWEST REGION

18 SCHWEIZER 2-33A GLIDER

6 BELLANCA 8GCBC SCOUT

Gliding Sites-
- Gimli MB
- Brandon MB
- North Battleford SK
- Moose Jaw SK
- Peace River AB
- Villeneuve AB
- Josephburg AB
- Netook AB
- Vulcan AB

Region Cadet Air Operations Officer - 17 Wing Winnipeg MB
Aircraft Maintenance Facility - Gimli MB
Region Gliding School (NW) - Gimli MB

CENTRAL REGION

22 SCHWEIZER 2-33A GLIDER

11 BELLANCA 8GCBC SCOUT

Gliding Sites-
- Mountainview ON
- Borden ON
- Chatham ON
- St. Catharines ON
- Markham ON
- Wingham ON
- North Bay ON
- Iroquois Falls ON
- Pineview ON

Deployments-
- Brockville ON
- Centralia ON
- Welland ON

Region Cadet Air Operations Officer - Mountainview ON
Aircraft Maintenance Facility - Mountainview ON
Region Gliding School (CEN) - Mountainview and Picton ON

Smithers
Peace River
Prince George
Villeneuve
Josephburg
North Battleford
Comox
Netook
Salmon Arm
Port Alberni
Nanaimo
Oliver
Vulcan
Moose Jaw
Brandon
Sparwood
Pitt Meadows
Cranbrook
Langley
Hope
Trail
Creston
Abbotsford
Grand Forks
Winnipe

National Defence / Défense nationale


ding Program
l Locations
ATLANTIC REGION
11 SCHWEIZER 2-33A GLIDER
5 CESSNA L-19
Gliding Sites-
Debert NS
Sydney NS
Greenwood NS
Saint John NB
Miramichi NB
Summerside PEI
Gander NF
Stephenville NF
Clarenville NF
Region Cadet Air Operations Officer - Shearwater NS
Aircraft Maintenance Facility - 14 Wing Greenwood NS
Regional Gliding School (ATL) - Debert NS
EASTERN REGION
14 SCHWEIZER 2-33A GLIDER
6 SUPERDOG
Gliding Sites-
Smith Falls ON
Lachute QC
Saint-Jean-Sur Richelieu QC
Bromont QC
Drummondville QC
Bagotville QC
Valcartier QC
Deployments-
Chibougamau QC
Rouyn-Noranda QC
Val d'Or QC
Mont-Laurier QC
Mont-Joli QC
Region Cadet Air Operations Officer - Saint-Jean-Sur-Richelieu QC
Aircraft Maintenance Facility - Saint-Jean-Sur-Richelieu QC
Region Gliding School (EAS) - Saint-Jean-Sur-Richelieu QC and Bromont QC
NDHQ- Director Cadets and JCR
Senior Staff Officer - Air / National Cadet Air Operations Officer (D Cdts 5)
Deputy National Cadet Air Operations Officer (D Cdts 4-6)
DAEPM(TH)8 - D Cdts 5-5 National Technical Authority (Air)
DAEPM(TH)8-2 - Deputy National Technical Authority (Air)
Gander
Clarenville
Stephenville
Saint John
Sydney
Miramichi
Summerside
Debert
Bagotville
Mont-Joli
Greenwood
Chibougamau
Shearwater
Rouyn-Noranda
Iroquois Falls
Val d'Or
Valcartier
St-Jean
Mont-Laurier
Drummondville
Lachute
Bromont
North Bay
Ottawa
Smith Falls
Mountainview
Trenton
Pineview
Brockville
Borden
Markham
Wingham
St.Catherines
Welland
Chatham
Centalia

Canada

THE BACK PAGE

Photo: Cpl Daisy Hiebert

With four years of DFS experience, 20+ investigations, an MSc in aircraft accident investigation, a formal upgrade program, Maj Jeep Regnier, DFS 2-7 Standards and Training, was recently awarded his IIC I qualification, bringing DFS' total of IIC I investigators to three. Additionally, Maj Barry Devereux, DFS 2-5 Maintenance, Mr Jean Brosseau, DFS 2-5-3 Airworthiness, and Maj Dennis Thornton, DFS 2-3 Multi-Engine, were awarded their IIC II qualifications.

The DND/CF Airworthiness Program is based on the following fundamental principles

- That airworthiness-related activities are completed to accepted standards
- Performed by authorized individuals
- Accomplished within accredited organizations
- Done using approved procedures

The Directorate of Flight Safety is not exempt from adhering to these principles and as the CF Airworthiness Investigative Authority must ensure his/her investigators are appropriately trained. Recently DFS took the final step to ensure the organization and Investigators-in-Charge (IIC) are properly accredited by introducing a final exam prior to award of their qualification.

An IICs has a lengthy training and upgrading process to progress from level III to level I. To be designated as an IIC I and given the responsibility to investigate the most serious of aircraft occurrences, an investigator must have DFS' full confidence to exercise the MND's delegated *Aeronautics Act* authority to examine matters concerning military aviation safety. This requires not only a broad understanding of investigative process and technical matters, but also significant field experience and a strong ability to sift through the confusion, complexity, and sometimes unavoidable tragedy of an aircraft accident to identify and communicate preventive measures so that personnel and materiel are guarded safe in the future.

Keeping in line with the principles of the Airworthiness Program, the inaugural group of IICs has become fully accredited through the completion of their final exams, which will shortly also become mandatory for all IICs external to DFS, such as Div FS and WFSOs.

Bravo Zulu to all four of them for their accomplishments!