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Defence

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ISSUE 2, 2017

Flight Comment



LESSONS LEARNED

Distraction

MAINTENANCE IN FOCUS

Put Down the Damn Wrench

VIEWS ON FLIGHT SAFETY

Director of Flight Safety

Canada 

Cover – Commemorates 100 years of military pilot training in Canada. Image of a Curtiss JN-4 (Canuck) from 1917 alongside a CT156 Harvard II.

Photo: DND



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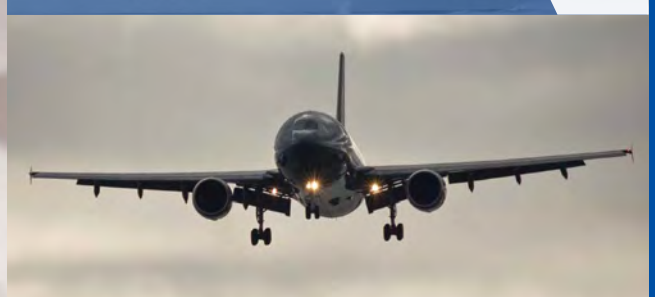
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Flight Comment



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DIRECTORATE OF FLIGHT SAFETY

Director of Flight Safety
Colonel Steve Charpentier

Editor
Major Claire Maxwell

Imagery Technician
Corporal Daisy Hiebert

Graphics and design
d2k Graphic Design & Web

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Send submissions to:

National Defence Headquarters
Directorate of Flight Safety
Attn: Editor, Flight Comment (DFS 3-3)
101 Colonel By Drive
Ottawa, ON, Canada, K1A 0K2

Telephone: 613-992-0198
FAX: 613-992-5187
Email: dfs.dsv@forces.gc.ca

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Views on Flight Safety

by Colonel Steve Charpentier, Director of Flight Safety

Time to move on. After completing a fourth year as Director of Flight Safety and the Airworthiness Investigative Authority, I wish to offer to both my successor and Royal Canadian Air Force colleagues alike, a couple of points that I have learned throughout my career.

First point: The Flight Safety Program works and has prevented many accidents and loss of life. When I joined back in 1981, the annual statistics were far worse than what we have today. We were losing 5-10 aircraft per year and the human cost was even greater. As a young officer cadet awaiting training, two of my course mates and friends from the basic officer course in Chilliwack died in two separate military aircraft accidents^{1,2} before they even started pilot training. Nowadays, we better understand the risk. It took us a while to understand that mission accomplishment and Flight Safety need to be seen as one. Whatever we do and want to accomplish, we need to fully understand the risk we take and make sure it is acceptable when weighed against the aim of our mission. Peacetime or wartime, there is no difference. I would argue that it is even more important in wartime to understand the risk and make sure we are willing to take it to accomplish the mission of the day.

Second point: It is all about basic skills. Aviation ground crew and aircrew occurrences are largely caused by human factors and they

are not random events: they fall into recurrent patterns. Different people at different bases and organizations that keep on making the same errors. The good news is that we can manage error when it is reported. We are all taught the proper ways to do our job. A lot of emphasis is put on the basic skills in order to create a strong foundation to build on. Many issues found in our database are the result of failing to apply our basic skills. How much basic training is enough? How many flying hours are required to maintain proficiency? One thing that has changed from the past is that we now have access to high performance simulators. In our quest to be more efficient, we are trying to cut back on basic training and rely more on simulation and computer-based training. Certain individuals amongst our ranks have even discussed reducing helicopter autorotation training or even getting rid of it altogether. Why so much emphasis on autorotation, they ask. We have simulators and most of our helicopters have 2 or more engines anyhow; the chance of having to conduct an autorotation is very remote...

Well, reality has shown us that you better be ready to face the unexpected. Back in 1995, we had two very experienced tactical aviation pilots mishandle an emergency, which turned into a dual-engine failure at which point forced them to execute a perfect example of a low-level autorotation. There were no injuries to the crew nor was there damage to the Griffon helicopter. More recently, a Danish

crew experienced a triple engine power loss on an AW101 Merlin helicopter. While at night and under night vision goggles, shortly after transition from the hover at about 150 ft., 75 knots and 12,000 kg loaded weight, a loud bang was heard and felt through the airframe. Immediately, a yaw movement occurred and the pilot flying noticed zero torque indications from all three engines and low rotor RPM. The aircraft captain (AC) took control and carried out an engine-off profile to a field. The total time whereby the AC took control, lowered the undercarriage, recovered the rotor RPM from 83%, turned into a clear area to flare and land without incurring any damage to the helicopter or harm to the crew: 15 seconds! Is our training sufficient to prepare us to do the same? To me, it is all about basic training and motivation of personnel. Train them well, make sure they are confident in their skills and well-motivated in their tasks and they will succeed with anything you throw at them.

Third point: We are trying to do too much for what our current capabilities can allow. I always hear this pointed out during my visits to units and I couldn't agree more. I am sorry to break the news, but computers, simulators and leaders with certificates in Business Administration have not enabled us to do more with less; rather they have enabled us to increase centralisation of control and management of the Canadian Armed Forces (CAF).

There are some good points to this, specifically it has allowed a higher-level comprehension of capability and control of resources however; there is also lots of time wasted in business planning and administrative tasks. When I joined, we had no computers, smart phones or internet for that matter. Commanding officers and flight commanders were the product of several years of experience on the flight line. They understood the higher intent and were in charge of their respective tasks. There are many distractions out there that divert us from our primary focus: to fix or fly aircraft and to deliver an effect. Sergeants are busy nowadays in offices trying to figure out how the Defence Resource Management Information System works or knee-deep in all sorts of paperwork. What is important and what is not?

Every new Commanding Officer out there wants to impress the chain of command with their talent and with it, an agenda that will differentiate themselves from the previous person. This often bloats the list of tasks to be accomplished by squadron members and also contributes to what seemingly becomes a perpetual surge in operations. The lesson to be learned here is to perhaps rein in the 'good idea train' and focus on current requirements by differentiating what is an essential task from those that are non-essential.

Experienced Sergeant technicians and above need to be on the floor to mentor their people. The same goes for senior aircrew; they need to be in the air sharing their experiences with the younger generation. In my final years, I found that the military has put too much emphasis on promotion, post-secondary education and early identification of individuals towards succession planning. The goal of your career should be to develop your competencies, experiences and overall, credibility, which in turn, will drive the tacit recognition and admiration from your peers and subordinates.



Chuck Yeager said it best: "Whatever my aptitudes or talents, becoming a proficient pilot was hard work, really a lifetime's learning experience. For the best pilots, flying is an obsession, the one thing in life they must do continually. The best pilots fly more than the others; that's why they're the best." The same wisdom applies to our technicians as well.

My final point: I strongly believe there is currently NO MISSION IN THE CAF THAT IS NO-FAIL. This terminology has been widely abused and leads to many mission centric deviations. For many years we have learned how to make things safe. Using James Reasons' *Swiss Cheese Model*, we have increased our resilience to accidents. However, when people believe the mission at hand is *no-fail*, they start circumventing those defenses by cutting corners, failing to follow procedures or simply pushing the safety envelope in order to accomplish more or save time. Such deviations are dangerous and contagious. They bypass the defensive resilience built into our processes. When they are not corrected, they are allowed to develop and become a cultural norm. This behavior puts all of us at risk and could also put the overall strategic intent of the mission at risk. For example, if an aircraft is not serviced properly and something important is missed, it is possible we may lose that aircraft during the *no-fail* mission and the overall effect could be a failure at the strategic level.

As an example, a CC177 Globemaster III being rushed into a theatre when crews are exhausted could result in the loss of the asset along with the crew and passengers alike. Many of you have heard me say this across CAF units. There are currently no, *no-fail* missions except perhaps the day that arrives where the events in the movie *Independence Day* come true and we will only have one chance to stop invading aliens...

In closing, I want to reaffirm that everyone has a flight safety role to play, but first and foremost *flight safety* is a leadership responsibility. For those of you with leadership responsibilities, it is all about proper management and control of operational pressures and ensuring that the associated risk is understood and accepted at the right level. The only *no-fail* mission is to deliver air power in a safe manner, period. Failure to safely manage these pressures and risks will give rise to the inappropriate *can do* attitude that often results in mission-centric deviations that are the root cause of many aviation accidents.

Fly Safe, Stay Safe and be Happy! ✈

References

1. In memory of Officer Cadet Céline Lacroix, 2 Oct 1981, FSIMS 2298.
2. In memory of Officer Cadet Jacques Lalonde, 19 Mar 1982, FSIMS 1425.

The Editor's Corner

The Editor's baton has been passed. Maj Pete Butzphal has run his race and now I'm it. The track seems to stretch far ahead and I'm keenly aware that you, my team, have high expectations of *Flight Comment*. My new mantra is "Stay in my lane. Don't stumble. Run a clean race. Finish strong."

But don't stumble? Don't make any mistakes? That's unlikely. My mantra doesn't work for real life because to finish strong, I need to know how to best make the journey. And that knowledge can only be gained through experience. According to Oscar Wilde, "experience is the name everyone gives to their mistakes."¹ So, as I start this new race, I need to expect some stumbles, the occasional lane crossing and maybe a few disqualifications. I have to remind myself that even the greats have had their moments of non-glory. Andre De Grasse, Canada's premier sprinter, once forgot to bring his spikes to a track meet and had to rely on a teammate to lend him some track shoes. The result was probably not a true reflection of his potential but he did learn to make sure he had all the right equipment for his next race.

**According to Oscar Wilde,
"experience is the name everyone
gives to their mistakes."¹**

The neat aspect of this experience thing is that we don't have to make all the mistakes by ourselves in order to learn. Experiences can

be shared and best practices can be passed on. We can learn a lot when we have a good teacher. Thanks in advance for lending me your shoes Pete!

Similarly, the flight safety program is a great platform to share those lessons. Every single one of our flight safety occurrences offers us a chance to learn and can pave the way for us to finish strong. I recognize that *Flight Comment* plays an important role in how we share our experiences and how our judgement can be developed. This sharing platform is critical to our collective growth and relies on all of us to tell our stories so that others can learn from them. The chinks in one person's armor can be the Band-Aid for others. So please spread the experience wealth and keep me busy with your tales of glory and, more interestingly, non-glory.

As for this issue of *Flight Comment*, to mark the 100th anniversary of the first military pilot training in Canada, our front cover shows a photo taken in 1917 of aircraft Curtiss JN-4 (Can) C332 of the Royal Flying Corps Canada. The Curtiss JN-4 aircraft were Canadian built and were commonly called the "Canuck." To show how far we've come, both in instructional methods and technology, we have included a photo of today's training aircraft, a CT156 Harvard II. Can you imagine climbing out on a wing to teach your student a point in today's air force? Maybe that explains the origination of the old adage "on a wing and a prayer."



To introduce a bit of levity into our magazine and to try and solicit some input, I'd like you to come up with a caption for the image above. Email me your suggestion and (as long as it's appropriate) I'll post it on our DFS website. The Director will pick the best one and we'll use it for our DFS Christmas card. If you think you can come up with a better image for our card, then send your idea in. If you wish to comment on anything else Flight Safety related then email away. I look forward to hearing from you. Here's to learning from our mistakes! 📧

Major Claire Maxwell

Reference

1. Oscar Wilde, *Lady Windermere's Fan*, Act III (1893).

Good Show

For Excellence in Flight Safety

Major Laurianne Darras

On 8 June 2016, while taxiing a CH124 Sea King helicopter from the hot fuel pit to Pad 3 at 12 Wing Shearwater, Maj Darras demonstrated exceptional situational awareness, professional and timely decision making skills and an extraordinary regard for safety by reacting to a situation that prevented catastrophic damage to a helicopter and injury to aircrew.

Maj Darras was the aircraft captain of the CH124 Sea King helicopter and her crew had just completed a routine hot fuel/crew change. After finishing the pre-flight checks, the aircraft was ground taxied to Pad 3 for takeoff. On approach to the pad, as the aircraft was making a left turn, the Sea King violently and abruptly pitched 10 to 15 degrees nose down and yawed to the right. This action brought the tail wheel off the ground approximately 46 inches and damaged an antenna housing located under the nose of the aircraft when it came in contact with the taxiway. This nose down angle coupled with the forward cyclic position when taxiing the helicopter brought the main rotor blade tips mere feet from contacting the taxiway.

Maj Darras' focused and measured reaction to this sudden change in aircraft attitude exemplified her flying skill and profound knowledge of the Sea King helicopter. With the helicopter precariously on the verge of tipping over, Maj Darras remained in complete control, as she expertly inputted slight aft cyclic and cautiously lowered the collective. Concurrently, Maj Darras ensured the co-pilot remained calm and when the helicopter recovered to a stable attitude, she ordered an emergency shut down. As Maj Darras and her co-pilot were finishing the emergency shutdown, the TACCO signaled that smoke was coming from the right main landing gear brakes. Shortly after the egress, the fire crew confirmed the brake temperature to be over 100 degrees Celsius. The hot brakes procedure was then completed by the fire crew without further incident. The Flight Safety investigation



Photo: MCpl Chelsey Hutson

revealed that the main landing gear right hand brake had locked up because of an internal failure of the brake master cylinder and worn brake liners.

If not for Maj Darras' superior situational awareness, coupled with her immediate and decisive actions, two consequences could have occurred. First, if she had not remained calm and diligent during the initial pitch down, the main rotor blades would have made contact with the tarmac causing catastrophic results. Secondly, as the helicopter returned to a level attitude, any overreacted control inputs, even in the slightest, would have caused the main rotor blades to strike the tail and result in a loss of directional control and serious damage to the aircraft. Maj Darras' exceptional skills and outstanding fortitude in an emergency situation directly prevented the loss of an air asset and avoided significant injury or possible loss of life. Maj Darras is fully deserving of this Good Show Award. 🍁

Good Show

For Excellence in Flight Safety

Corporals David Gurba and Matthew Westhaver

On 29 August 2016, while on the return leg of an overseas mission, a CC177 Globemaster III carried out an enroute stop in Koln Germany. Technician crewmen Cpl David Gurba and Cpl Matthew Westhaver were required to carry out routine servicing in the form of a 'thru-flight' inspection and perform the requisite engine oil top-ups.



When Cpl Gurba opened one of the oil cans from the onboard case, he immediately noticed that the engine oil labelled SEN SYN23699 C/I (NATO code 0-152) looked different than normally expected. Instead of the usual amber-orange colour, the fluid appeared red and less viscous than normal and had an unfamiliar odour-characteristics indicative of hydraulic fluid or agricultural diesel. Cpl Westhaver inspected the fluid and confirmed it as being

suspect and therefore questionable for use in the engines. Wisely, they decided against using their current supply of oil and instead sourced oil from their USAF counterparts at destination.

Continuing to display excellent judgement, Cpls Gurba and Westhaver contacted 429 (T) Squadron Servicing to determine if their oil reserve was of a new type or if the specifications had changed; the reply confirmed that it had remained unchanged. They passed along the suspect batch identifier, photos of the actual cans in their possession and that of a clear container with the red fluid inside (which was clearly not engine oil). Cpls Gurba and Westhaver saved the suspect fluid, checked another can from the same case of oil and found it to also be suspect. They elected to isolate the remaining fluid for further investigation.

All of the oil labelled as batch SEL1509161 was then quarantined both at home and abroad. It was sampled and investigated by Quality Engineering Test Establishment, leading to the identification of approximately 70 cases of partially contaminated oil that had affected at least 4 different Wings across the country. This resulted in all RCAF aircraft that use this type of oil being temporarily grounded pending further investigation, and all engine lubricant stores matching the identified batch number being quarantined and removed from service to prevent inadvertent use.

Cpl Gurba and Westhaver's dedication to their profession, their conduct and attention to detail during a routine check is exemplary. Their actions averted potential disaster for not only for those on their flight, but for the entire CC177 fleet and other affected fleets of the RCAF. They are truly deserving of this Good Show Award. 🏆

For Professionalism

For commendable performance in flight safety

Lieutenant Jarrod Hanson

On May 20th, 2016, Lt Jarrod Hanson, a glider pilot with the Air Cadet Gliding Program, discovered a potentially serious problem with a Bellanca Scout tow aircraft. Being dual qualified as both an Aircraft Maintenance Engineer and as pilot, Lt Hanson was conducting a 50 hour inspection and replacement of the tail spring assembly when he discovered that the upper elevator control cables were crossed.

During the course of the inspection, Lt Hanson noted an uninstalled, undamaged, pulley guard. Investigating further, in an area very difficult to reach, he was able to determine that the elevator control cables were crossed and in contact with both elevator trim cables. He was also able to determine that the tension caused by the misrouted cables resulted in the trim cables being trapped against the structural tubular members, possibly preventing the normal operation of the trim system.

These cables were not scheduled for inspection for another 50 hours during which time the aircraft would have conducted numerous flights with a glider in tow. Had this situation resulted in binding of the elevator or a trim failure in flight, the consequences could have proven severe for both the tow plane and glider.

Lt Hanson's diligence, professionalism, and attention to detail allowed him to discover a situation that, if left unchecked, could have ultimately resulted in the potential loss of aircraft resources and personnel. Lt Hanson's outstanding actions and judgement make him very deserving of the For Professionalism Award. 📌



Photo: DND

Master Corporal John Humble

On 23 June 2016, MCpl John Humble, recently posted to 12 Air Maintenance Squadron's Aircraft Maintenance Control and Records Office (AMCRO), discovered a major component history discrepancy during a post maintenance audit of a CH124 Sea King helicopter at contractor facilities, that resulted in the aircraft overflying a key maintenance inspection.

While reviewing the history of a primary servo cylinder housing, MCpl Humble noticed the Time Since New (TSN) data entered in the Automated Data for Aerospace Maintenance (ADAM) was different than most current Component History Card (CF358) data. Normally, correcting the hours to match the CF358 would have been an acceptable course of action, however MCpl Humble was not satisfied with this simple fix and so, on his own initiative, he decided to investigate further. His analysis revealed that the TSN from a CF358 card dated 11 Jan 1993 had not been transcribed.

This discrepancy caused the housing to be overflowed by an additional 1500 hours beyond its safe life design and, had it continued to go unnoticed, the part would have remained in-service until its next scheduled inspection or possibly its ultimate failure.

The servo cylinders are critical components of the flight controls and failure would have removed a vital aircraft system resulting in an inflight emergency. As a result of this discrepancy a 100% audit of all CH124 aircraft and components comparing CF358 documents versus electronic information analysis in ADAM was carried out in order to verify that there were no other deficiencies. Although no other discrepancies of this scale were discovered, multiple other errors were uncovered and resolved.



Photo: LS Brad Upshall

MCpl Humble's attention to detail, his maintenance knowledge of servo cylinders and his dedication to investigate further resulted in the identification and rectification of a significant flight safety risk. His dedication and professionalism are highly commendable and deserving of this For Professionalism Award. 📌

For Professionalism

For commendable performance in flight safety

Corporal Mark Delarosbil

On 23 June 2015, Cpl Delarosbil, an aviation technician with 8 Air Maintenance Squadron Trenton, was preparing a CC130J Hercules aircraft for engine functional and leak checks. He noticed oil dripping from the number two engine drain and from the bottom of the nacelle. Investigating the source of the leak, he removed the nacelle panels and found oil dripping from the engine compressor section. He took it upon himself to verify the state of the other engines and discovered oil had seeped into all of them. Having an extensive knowledge of the system, Cpl Delarosbil knew that it was possible for the engine oil shut-off valves to be open if the fire suppression check

had been actioned in the wrong sequence. In this case, there would be no visual indication of the position of the valves. Through additional testing and verification he was able to determine the shut-off valves were, in fact, open on all engines.

With the shut-off valves in the open position, over six litres of oil had drained into each engine accessory drive, where normally there are only minute amounts. If the oil accumulation had gone unnoticed, this incident could have resulted in the engines being damaged beyond repair. With nothing in the repair guide to affect a rectification, Cpl Delarosbil liaised with the Rolls Royce engine original

equipment manufacturer service representatives and worked with them to implement a repair procedure. A CC130J fleet-wide modification was initiated to prevent a recurrence of this potentially dangerous and costly situation.

The fact that Cpl Delarosbil successfully identified the open valves without a visual indicator speaks to his exceptional technical expertise. His vigilance and exemplary actions kept three of the engines in service and averted possible destruction of the fourth, making Cpl Delarosbil highly deserving of this For Professionalism Award. ✦



Photo: Cpl KW Belwicz

Corporal Gaétan Paulin

In May 2016, Cpl Gaétan Paulin, a Level A aviation technician with 413 Transport and Rescue Squadron was tasked to lead the no. 2 engine removal on a CC130 Hercules aircraft. His attention to detail and superior knowledge allowed him to discover a discrepancy in the sling assembly used to remove the engine that could have resulted in significant damage to the aircraft had it been used.

Operational tempo at the squadron was high during this time; search and rescue operations and force generation missions were being carried out with limited serviceable flying assets. Despite the pressures, Cpl Paulin conducted a very thorough inspection of the engine sling assembly and discovered a discrepancy. Upon further research and a detailed review of the applicable *Canadian Forces Technical Orders*, he was able to

determine that the sling markings “Engine with Prop” and “Engine without Prop” had been reversed. The sling had just returned from its annual inspection where it had been newly painted and stenciled. Cpl Paulin immediately raised the issue to his supervisor and quarantined the engine sling assembly.

Using a mislabeled engine sling assembly would have resulted in an imbalanced weight distribution of the engine once lifted by the crane. It is likely that this imbalance, of approximately 1100lbs, would not have been controllable by the technicians during the crane lift and the engine could have shifted. Had this occurred, the potential for damage or serious injury to personnel would have been high.

Cpl Paulin’s keen attention to detail and superior knowledge averted a potentially costly and hazardous situation and is truly deserving of this For Professional Award. 🦅



Corporal Frederick Ralph

On 26 June 2016, as part of the ground operations team following the Quinte International Airshow, Cpl Frederick Ralph demonstrated outstanding perseverance and an acute attention to detail, preventing a serious flight incident.

After the completion of the air show, Cpl Ralph was waiting for various static display aircraft to depart so that his team could continue their work of returning the airfield to normal operational conditions. As the aircraft were lined up to depart off the west ramp, Cpl Ralph observed that the pitot tube covers on one of the vintage aircraft, a civilian owned and operated Harvard, had not been removed. He quickly gained the attention of the ground marshaller who stopped the pilot and allowed the issue to be corrected before takeoff.



Cpl Ralph’s admirable display of diligence and situational awareness, coupled with his initiative to act quickly, allowed a critical hazard to be rectified and so prevented a potentially serious incident from taking place.

Cpl Ralph is fully deserving of this For Professionalism award. 🦅

For Professionalism

For commendable performance in flight safety

Corporal Matthew Thompson

On 19 February 2016, Cpl Matthew Thompson, an aviation technician with 427 Special Operations Aviation Squadron, was tasked with conducting a routine 25-hour inspection on a CH146 Griffon helicopter.

Working in austere conditions at night and with minimal lighting, Cpl Thompson was able to discover and rectify a potentially serious issue with the aircraft. While inspecting the Tail Rotor System, he noticed that the Bell Crank Assembly Counterweight retaining washers were loose and spinning free. Although this was not specifically part of the 25-hour inspection criteria, Cpl Thompson took the initiative to promptly investigate further. Researching all applicable *Canadian Forces Technical Orders*, he was unable to find any specific direction on this situation. He then contacted a technician back at his home unit to determine if other aircraft had the same issue. After confirming that no other aircraft's retaining washers were free spinning, with

determined persistence Cpl Thompson requested permission from his crew chief to contact the Bell Field Support Representative. After explaining his findings to the representative via telephone, it was deemed that his discovery was worthy of further examination. Using a torque wrench to carry out removal of the Bell Crank Assembly hardware, he was able to determine that the torque on the nuts was actually half of the required setting. Cpl Thompson then obtained new hardware, but was still unable to achieve the proper torques. Despite the perceived pressure to provide mission ready aircraft, he chose to remove the aircraft from service and order new parts for installation. Upon return to 427 Sqn, the affected components were examined and determined to be out of tolerance. Had the aircraft continued to fly in this condition, it could have resulted in an emergency situation for the crew.

Cpl. Thompson's discovery and self-driven actions prevented a potentially serious

condition from persisting. His determination, professionalism and outstanding due diligence make him very deserving of the For Professionalism Award. 🇨🇦



Corporal Heliel Torres

Cpl Heliel Torres, an avionics technician with 443 Maritime Helicopter Squadron, was tasked with conducting a routine maintenance record audit. His outstanding attention to detail and persistence allowed him to discover a significant maintenance discrepancy that could have posed a serious flight safety risk.

Continued on next page



Private Connor Johnston

On 11 April 2016, Pte Connor Johnston of the Grey and Simcoe Foresters Regiment, was deployed to Resolute Bay, Nunavut in support of Operation NUNALIVUT 16. Pte Johnston demonstrated exceptional situational awareness and professionalism when he made a CC138 Twin Otter crew aware of a potential flight safety hazard.

Operating out of a remote camp on Little Cornwallis Island, Pte Johnston, was part of a 100-person patrol that was on day four of a twelve-day patrol. Conditions on that day were extremely challenging with temperatures in the -30 degrees Celcius range and winds gusting from 20 to 30 knots. A CC138 Twin Otter had just completed a resupply mission to an austere ice strip at their location and was taxiing for takeoff. Pte Johnston noticed that the personnel ladder was still deployed. Unsure if this was a normal configuration, he immediately alerted the



radio operator who contacted the aircraft and advised the crew, who were able to stop the aircraft and stow the ladder. Pte Johnston's prompt and professional actions prevented damage to the aircraft and potential danger to personnel on the ground had the ladder detached in flight.

Pte Johnston is to be commended for his astute observation and highly professional conduct that prevented a potentially hazardous situation from developing. He is, therefore, most deserving of this For Professionalism Award. 🦋

Corporal Heliel Torres ...Continued

In the course of his audit, Cpl Torres noticed that maintenance had been conducted on a CH124 Sea King collective friction lock without being followed by the required Aircraft Stabilization Equipment (ASE) coupler functional check as required by a note in the *Canadian Forces Technical Orders*. The ASE and its various sub-systems are used to help the pilot control the aircraft and its use is mandated when operating in close proximity to the water in Instrument Flying Conditions.

Suspecting that this omission might have occurred on other aircraft, Cpl Torres spear-headed an exhaustive maintenance database search. He discovered that out of 28 records of maintenance performed on the friction lock, 20 were not followed by the ASE coupler functional check. As a result of this discovery, the missed inspections were carried out on six different aircraft located on both the West and East coast.

Cpl Torres' meticulous attention to detail as well as his outstanding perseverance in discovering and researching the situation make him truly deserving of the For Professionalism Award. 🦋

For Professionalism

For commendable performance in flight safety

Mr. Ryan Bilton

On 26 July 2016, Mr. Ryan Bilton, a civilian aircraft structures technician (ACS) with IMP Aerospace in Trenton was carrying out a scheduled modification on a CT114 Tutor as part of a periodic inspection. While completing the modification, inside the very cramped aft section of the aircraft, his attention was drawn to an area adjacent to where he was working. Upon closer inspection, he detected a small crack where the vertical stabilizer attached to the aft fuselage.

Mr. Bilton immediately notified the ACS supervisor who requested nondestructive testing (NDT) support. The subsequent NDT findings showed several more cracks in this critical structural area identified by Mr. Bilton. Following the reporting of these findings to the CT114 Aircraft Engineering Officer (AEO), Mr. Bilton and his supervisor researched the repair scheme to rectify this problem. His discovery led to a flight safety investigation that identified a modification on this particular aircraft that had been missed over a 20 year period.



The AEO then ensured that there were no other aircraft in the fleet subject to a similar missed modification.

Mr. Bilton's detection of the cracks, while carrying out other aircraft maintenance under difficult conditions, was certainly beyond the expectations and requirements of his assigned task. His awareness of his environment and

outstanding observational skills led to the detection of this problem. Had these cracks not been detected they would have continued to spread resulting in a much more costly repair or possible loss of the aircraft. Mr. Bilton's dedication and attention to detail make him a deserving recipient of the For Professionalism Award. 🏆

Ms. Jade Marshall

On 6 December 2016, while working on a connector under the cockpit floor of a CT142 Dash-8 at PAL Aerospace in St John's NL, Ms. Jade Marshall, an Aircraft Engineer, noticed a loose gust lock push rod. Her attention to detail prevented a separation in the elevator flight control linkages.

Ms. Marshall was working on an unassociated modification when she noticed an anomaly in the elevator control linkages. Upon closer examination she determined that the nut holding the control rod did not have a split pin. She left the area undisturbed and contacted the 402 Sqn representative on site.

Further investigation under the direction of Flight Safety found that the missing split pin had allowed the nut to back off with only a few threads remaining before total control rod detachment and failure of the gust lock system.

Continued on next page

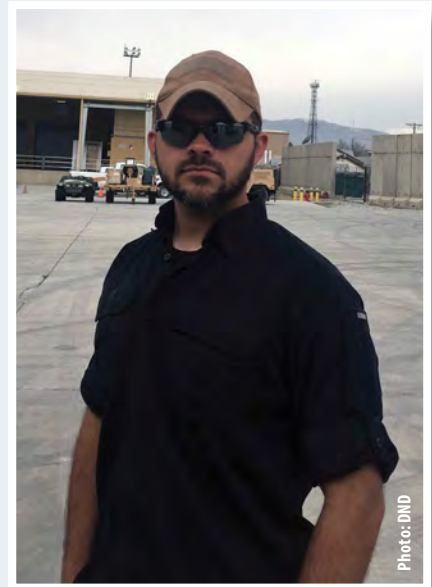
Mr. Nolan Taylor

On 28 January 2016, Mr. Nolan Taylor, a Boeing Contract Support Technician working with 450 Tactical Helicopter Squadron was tasked with disconnecting the engine fire bottle squib wiring on a CH147 Chinook helicopter. This task was required to facilitate the removal and weighing of the engine fire bottles.

Mr. Taylor inspected and removed the forward engine fire bottle squib wiring noting the position and orientation of the wires and marking them as per the maintenance procedure. While disconnecting the aft fire bottle squibs he noticed an inconsistency in the wiring. This wiring, unlike the previous one, had a solid white wire attached by a screw to the squib where there should have been a white wire marked with a thin blue stripe. He subsequently checked the wire on the adjacent threaded stud and visually confirmed it had the wire marked with a blue stripe. Verification with the Electronic Wiring Suite confirmed his observations.

The wiring to activate the squibs in the CH147 engine fire extinguisher system consists of four shielded twisted pairs. The white wires in each pair supply the 24 volt signal to activate the individual squib and the second conductor, a white wire marked by a blue stripe, is the ground lead. Cross referencing the Interactive Electronic Technical Publications, he confirmed that the power wires are to be connected to the threaded stud and the ground wires screwed to the squib housing. Reversing these wires would render the system inoperable.

A local supplementary inspection was initiated and two more CH147s were found to have the same wiring error. The outstanding attention to detail displayed by Mr. Taylor during the inspection of this wiring was instrumental in preventing the potential failure of the engine fire extinguishing system. Mr. Taylor is unquestionably deserving of the For Professionalism Award. 📌



Ms. Jade Marshall ...Continued

Although new to the avionics field, Ms. Marshall's situational awareness and prompt action aided in an effective Flight Safety Investigation. Her positive attitude combined with her astute recognition of a potentially hazardous problem and judgement in dealing with an abnormal situation makes her very deserving of the For Professionalism Award. 📌





From the

Flight Surgeon

The Div Surg App: A new mobile resource library and tool – “pocket guide”

By Richard Zoltenko, IT Project Manager, Canadian Forces Health Services Group Headquarters, Winnipeg

Bafter being appointed as the 1 Canadian Air Division (1 CAD) Surgeon, LCol Richard Hannah quickly identified the need for an online pocket guide to assist aeromedical specialists and flight safety investigators. He envisioned a resource with quick and easy access to an up-to-date online library. An anytime/anywhere connection completely separate from the Defence Wide Area Network (DWAN) and accessible from any smartphone or tablet was required.

“Our goal is to put the right information in the hands of the decision makers, wherever they are and on any device.”

—LCol Richard Hannah

The solution, a cross-platform mobile application called the Div Surg App, was developed in less than six months. This application (app) features a complete up-to-date library and select tools to meet the needs of the aerospace medicine and flight safety communities.

“With the tap of a fingertip, aerospace medicine and flight safety specialists can access up-to-date reference libraries and tools to make their job easier.”

—LCol Richard Hannah

Released in May 2016, the Div Surg App has reached a following of over 700 active users and continues to grow. Whether on call/duty, at a clinic or classroom, at the point of care, or on-site at a flight safety investigation, the app is available to provide current information to help clinicians and investigators in the field make better decisions. **The following are just a few examples of how the app can be applied:**

- Following a helicopter crash, a team of flight safety investigators can check crash scene resource material to ensure proper procedures are followed.
- After a lengthy search, a search and rescue technician (SAR Tech) can determine the drug dosage for a child found in a state of seizure. The app can provide instant access to specific drug information and other medical references.
- A flight surgeon can use the app to arrange an aeromedical evacuation of a wounded soldier.
- A physician can refer to research and reference resources in the field while being deployed overseas.

In June 2012, the “Manhattan Research/Google Physician Channel Adoption Study” reported physicians spend the majority of their online time (64%) looking for information to make or support clinical decisions which is twice the amount of time spent reviewing print resources. By developing the Div Surg App, the 1 CAD Surgeon Directorate provides convenient and quick access to evidence-based information, negating the need to run to a desktop computer while supporting clinical decision-making at the point of care.

The app is like a ‘pocket brain’ by providing quick and easy access to informational resources and supports the following disciplines:

Aerospace Medicine:

- Complete collection of flight surgeon guidelines, aerospace medical authorities and “CAF Flight Surgeon Handbook”
- Medical videos

Aeromedical Evacuation (AE):

- AE aide-memoire for sending and receiving physicians (online fillable form)

- Strategic Aeromedical Evacuation Request Form (online fillable form)
- Initial MEDSITREP (online fillable form)
- Procedure for initiating strategic and tactical AE missions

Search and Rescue (SAR):

- SAR Tech “Pre-hospital Protocols and Procedures” are provided in its entirety with searchable and quick access features
- Up-to-date standard medical kit configuration
- Medical directives

Preventative Medicine (PMed):

- Common PMed resource documents in occupation/environmental health, public health and pest control

Flight Safety:

Flight Safety Investigation

- Crash scene management
- Accident investigation general sources
- Accident investigation medical sources

Fatigue Risk Management (FRM)

- “Commander’s Guide to Fatigue Management”
- Fatigue orders and references
- FRM System tools and quick references



Photo: DND

Features:

- Search, scroll and zoom
- Make comments on PDFs using sticky notes and drawing tools
- Ability to cut and paste material from the guides into working documents
- Highlight and mark up text with annotation tools
- Print documents from mobile devices

Contact Form:

- Direct links to the 1 CAD Duty Surgeon and CAF Flight Safety hotline.

Events:

- Online registration (fillable form-submit online)
- Conference information (admin instruction, schedule and map)
- Conference evaluation (fillable form-submit online)

The Div Surg App is still in its infancy but it has already proven to be a valuable tool. As its features and use-cases expand, there may be a need to launch separate apps for each discipline. The future of the app lies in embracing new technological advancements while meeting the ever-changing needs of the aerospace medicine and flight safety communities.

The Div Surg App is free and can be downloaded from the Mac App Store¹ or on Google Play².

Editor’s Note:

Currently the Div Surg App’s Flight Safety Investigation and Fatigue Risk Management pages are only available in English. Bilingual versions of these pages are being developed and should be available in future updates. 📌

References

1. Mac App Store is a service mark of Apple Inc.
2. Google Play is a trademark of Google Inc.

MAINTENANCE IN FOCUS



PUT DOWN THE DAMN WRENCH!

by Matt Zuccaro — president and CEO of HAI. This material first appeared in the Summer 2016 issue of ROTOR magazine.
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Recently I was briefing the Helicopter Association International (HAI) Safety Committee on HAI's 'Land & LIVE' program, also known as our 'Land the Damn Helicopter' initiative. As most of you know, the program promotes a pilot's responsibility to make a precautionary landing when the flight is not going well. This could be because of deteriorating weather, aircraft systems warnings, low fuel, illness, or any other reason that the pilot deems appropriate.

In the course of the discussion, Safety Committee member John Knotts, a pilot with the Arizona Utility Salt River Project, posed an excellent question: "What about the maintenance personnel? Why aren't we telling them to 'put down the damn wrench' when they are faced with things not going well?"

I did not have a good answer for John and immediately realized we absolutely should address this.

Aviation maintenance technicians are highly skilled, trained, and licensed professionals. Just like pilots, maintenance technicians have the ultimate responsibility: the lives of others are entrusted to their care.

In the aviation community, professionalism is defined as doing the right thing, even when no one is watching, and this quality is just as important in maintenance technicians as it is for the rest of the aviation team.

Just as pilots do, maintenance technicians need to constantly review their environment and activities:

- Do I have the necessary tools and equipment to safely perform the work? Is the working environment and infrastructure adequate?
- Are the current, relevant technical reference manuals readily available?
- Am I completely satisfied that the aircraft or component is ready to be returned

to service? Alternatively, am I comfortable leaving the aircraft or component in service?

Any evaluation must also include a personal check-in:

- Am I feeling healthy and alert?
- Do I feel competent to perform this procedure?

If your answers to any of these questions are "No" or "I'm not sure," then stop and put down the damn wrench!

In many instances while working on aircraft or after making an operational or airworthiness decision, maintenance technicians are subject to third-party pressures that don't align with a safety-first culture. "When will the aircraft be ready? We're ready to go now," says the customer. Or when a maintenance issue is detected, the boss asks, "Can't we do just one more flight and then ground the aircraft?"

These can be tough questions to answer, especially when the guy asking them signs your paycheck. However, saying “someone made me do this” is not a reason to do something you know is wrong.

Just as pilots are responsible for the safe conduct of a flight, maintenance technicians are responsible for confirming the airworthiness of an aircraft or component. This professional division of responsibilities is one of the foundations of our aviation safety culture—and one of the reasons our industry has prospered and grown.

When presented with difficult questions, maintenance technicians have the opportunity to confirm or deny their true commitment to safety first, above all else. If anyone—co-worker, boss, or customer—tries to pressure you into an action that betrays that commitment, my advice is to put down the damn wrench!

Believe me, you don’t ever want to get that call where you learn that an aircraft or component you worked on was involved in a catastrophic accident. Before turning your back on professionalism, think hard about the potential effects of your decision.

The rest of us in aviation need to remember that maintenance can be challenging. Much of it is done at night, while the rest of us sleep; some is done in remote areas, subject to weather conditions, with limited infrastructure and equipment.



Unlike flying, which can generate revenue for an operator, maintenance only consumes revenue. Although completely necessary to the safety and efficiency of operations, it is often just dismissed as overhead.

“When presented with difficult questions, maintenance technicians have the opportunity to confirm or deny their true commitment to safety first, above all else. If anyone—co-worker, boss, or customer—tries to pressure you into an action that betrays that commitment, my advice is to put down the damn wrench!”

Maintenance personnel perform their duties in the shadows, often without recognition or appreciation. So let’s give them the respect and support they deserve. We cannot achieve our safety goals without the expertise and professionalism of our maintenance brothers and sisters, without every member of our team.

I want to thank all of the maintenance men and women whom I have had the privilege to work with over the years, both civilian and military. Everybody reading this should do the same. Hug a maintenance technician today—you will be glad you did.

That’s my story and I am sticking to it. Let me know what you think at tailrotor@aol.com.

As always, fly safe—fly neighborly. ✈

Distraction

by Collin Fraser

Mr. Fraser has flown for over 40 years in many types of aircraft, at all levels of civil aviation, across Canada and abroad. Mr. Fraser flies with a major airline and contributes regularly to Flight Comment.

I made a mistake. It was a big one. I have no excuse. At the same time, there are reasons which I feel were contributing factors. Keeping in mind the theme of distraction, let's follow the sequence of events and see what might be learned.

My job was flying long haul. For the past year and more, I had worked the same basic pattern. I flew all night once a week, from western Canada across the arctic to Europe. The shift length was ten to twelve hours. I always found it very difficult to fight the urge to sleep that became nearly overwhelming between 2 and 5 am on my body clock. I honestly thought I could feel my life getting shorter.

Before commencing our descent into busy airspace, my partner and I would dose ourselves with caffeine in a desperate attempt to sharpen up for the demands of approach and landing our big jet. Even so, we were groggy and error-prone. We struggled to be alert, and perform with discipline and finesse.

Occasionally, we would land to deplane some of our passengers, then take off again for a short, high-workload flight to our final destination. More than once, we pilots agreed that we could not recall in detail that last segment. We were mentally and physically exhausted.

In the case being discussed, my previous flight had been an overnight from Vancouver to Paris.

Once at the hotel, mid-day local time, I went straight to bed intending to sleep like the dead. Even so, noises from housekeeping staff, other guests, street sounds, sirens and jack-hammers disturbed my rest. My natural urge was to sleep as long as I could. However, planning ahead for work the next day required that I get back up after four hours or so. Waking and rising so soon was a real effort. It felt like pushing the lid off of my own coffin.

The idea was to have an evening meal and stay up late enough to sleep again during local night hours, hopefully to be rested for the late morning departure next day. Returning to bed, my body clock was so confused that, no matter how tired I felt, sleep was elusive and of poor quality. I flopped around on my mattress like it was a trampoline. My morning alarm was set for 1am in my home time zone.

On the fateful day, my assigned route was Paris-Toronto. My flight department managers favored the efficiencies of having pilots be simultaneously rated to fly two different aircraft types. I had flown to France on one type. I had been working on that aircraft for over a year, and had 1000+ hours of experience. I would fly back to Canada on the other type, which I operated infrequently. I started the day with only 25 hours on that aircraft.

My flight deck work station was unfamiliar and a bit cramped. Climbing into my seat, I banged a shin and scratched the face of my watch. I had to re-familiarize myself with control locations and checklist items.

Quick turnarounds were always a high priority, the financial fact being that an aircraft on the ground was an expense; an aircraft in flight was generating income. Pre-flight preparation always had a sense of haste.

Our aircraft was not equipped with a data link, so I listened to the airport departure information tape recording on the radio, and wrote it down for my partner and I to consult and plan from. While English is the international standard language of aviation, air traffic controllers in individual nations use their native language when communicating with their countrymen.

"You can live through any amount of embarrassment. Just don't overlook the lesson. It might save your life."

The result is that controllers in various areas of the world speak heavily accented English. The voice on the information tape was, technically, speaking English. However, I listened to the loop three times, trying to discern the vital facts.



While I was pressing my earphones tight to my head, pretending that it might help the translation of pleasant-sounding syllables into aviation English, there was a constant stream of well-intentioned interruptions. The purser stepped in to ask if I would like coffee. The fueller came up for me to sign the receipt. Our ground agent needed to confer about passenger and baggage loading. My partner pilot returned from doing the walkaround inspection of the aircraft and issued a verbal report. I knew that there were words on the info-tape that I had not understood. Still, looking at my notes, the usual required information was complete. I moved on to other pressing tasks.

Entering our flight plan and performance data into the flight management computers took several minutes. We ran our checklists,

coordinated with cabin staff for closing doors, and negotiated with ground control and the tug crew for pushback and engine start. We configured the aircraft for takeoff, ran another checklist, and obtained clearance for a detailed route to the takeoff runway.

Taxiing out, we were in the middle of conducting yet another checklist, when the marginally intelligible voice of the ground controller on the radio asked if Runway xx, at some (muffled) number of meters length, was sufficient for our takeoff needs.

This particular airport had four parallel runways, and we were headed toward the longer strip of one pair. It was our normally assigned runway. While we usually referenced lengths in feet, I knew that runway was long enough for operations at heavier gross weights than we had that day. I replied "Affirmative."

We repeated the interrupted checklist, got a "Cabin secure" call from the purser, engaged in several more of the 'we talk, you talk, we talk' radio clearances to access the runway, and were finally ready to take to the sky.

We changed radio channel to the tower controller. He was responsible for traffic on the pair of runways where we were located. One accommodated a steady stream of landing traffic, which was the controller's focus of attention. As arrival spacing allowed, he permitted departures from our runway. He cleared us for an "immediate" takeoff.

My partner was Pilot Flying (PF) for this flight, and mostly looked outside to steer the aircraft during acceleration to flying speed. If we encountered a critical failure prior to a predetermined speed, our drill was for PF to declare a "Reject", and commence a maximum effort stopping maneuver.

My role, as Pilot Monitoring (PM), was to ensure the engines achieved full thrust, monitor all systems for nominal function, announce any failures and, especially, call out increasing speed indications. As such, much of my time was spent 'head down'. Procedures also called for me to monitor the aircraft path, which, I must admit, I limited to peripherally watching for adherence to the runway centerline on that day.

As acceleration progressed, communication between pilots, per normal, became one-sided. I called "V1", a speed we calculated before every takeoff, above which we were going flying no matter what, as there would not be enough runway remaining on which to stop. The next higher speed call would be the cue for PF to lift the nose toward climb attitude.

Continued on next page

LESSONS LEARNED

Distraction ...Continued

Just prior to that speed, the PF started to ease the nose into the air. That was most unusual. I called "Rotate" at the correct speed, and looked up along our path. There were men and heavy machinery spread out all over the runway in front of us!

We were in serious trouble. There was absolutely no way to stop before crashing into the people and equipment ahead. Our one option was to continue the takeoff and hope that the aircraft would clear the obstacles. I could see men's faces turning our way in surprise. I could see trucks, excavators, vans, generators, light posts...

My partner was very steady, and rotated the aircraft at a deliberate rate to a slightly high attitude. Our wonderful wings gave a mighty heave, and the aircraft lifted off with authority. Still, the landing gear and our tail were well below the level of the flight deck. By the thinnest of margins, we climbed away from what could have been a major disaster.

There is no 'time out' in a flying machine. The demands of transitioning the jet to enroute climb and dealing with multiple communication changeovers kept my partner and I task-saturated for a considerable time. When we were established on our trans-oceanic track, we discussed how we could possibly have wandered into such a dangerous trap.

I admitted that I might have missed a reference, on the airport information tape, to our selected departure runway being less than normal full length. Also, I had not picked up on the indirect clue to the situation when the ground controller had queried our takeoff distance requirements. I had failed to see, until too late, the obstacles ahead. We were very lucky that my failure to perceive the inadequate runway length had not killed us all. I had, to say the least, made a big mistake.

I thought long and hard about that incident for years. I was embarrassed and humiliated. I had come up way short of my professional responsibilities. I was angry with myself.

"I had failed to see, until too late, the obstacles ahead. We were very lucky that my failure to perceive the inadequate runway length had not killed us all. I had, to say the least, made a big mistake."

Finally, I managed to examine the chain of events with a more dispassionate eye. I concluded that a key underlying cause of my failure to perform was distraction.

Photo: Cpl Jean-Roch Chabot



I believe that several factors had accumulated to drain and divert my attention. Let's list them out.

I was subject to both chronic and acute fatigue.

I was in an unfamiliar type of aircraft.

My preflight duties were rushed.

My listening skills were challenged by controllers speaking accented English.

Interruptions to my concentration were an ongoing issue.

I did not scan the runway for obstacles.

It was clear that I had failed three times to detect the problem of insufficient runway length.

It was also clear that there had been other failures. For instance, I was certain I had not heard, from any source, the words "men and equipment" or "work in progress" on runway xx.

I was astounded that an airport authority would allow heavy jets to take off from a runway occupied by work under way. Our flight dispatch department had not warned us of the hazard. And, where was my partner pilot during this event?

Other people and agencies will make their own mistakes. That's the way it is in the complex and dynamic environment of aviation. We come back to the hard fact that I had multiple opportunities to act as the safety backstop, and did not.

The core issue is that I was undone by distraction. The personal and systemic factors that combined to prompt my inattention were largely out of my control. I was accustomed, by decades of experience, to successfully dealing with distractions. The one time I failed to pick vital safety information out of the noise nearly became the worst day of my life.

We now come to the part of this article where I summarize a tidy warning about the risks of distraction creeping up on you and interfering with your own job performance. There is actually no need to keep hammering away at it: I am sure you get the point.

Admitting mistakes can be very uncomfortable. I recommend the concept that anyone involved in a highly demanding activity can only benefit from balancing soaring confidence with some grounding humility.

My dad, an accomplished Air Force and civil aviator, told me when I started flying, "You can live through any amount of embarrassment. Just don't overlook the lesson. It might save your life." ♦



Hot Maintenance

by Chief Warrant Officer Ward Golden, Directorate of Flight Safety, Ottawa

During my time as a communication radar systems (CRS) technician in the 1990s, I was directly involved in a situation that throughout the years has caused me to analyze the decisions I make. During this time the CF188 Hornet was going through a radar system upgrade that was problematic to say the least. The newly modified radar antenna was not compatible with previous system components and could only be installed with the new system. There was not a surplus of the upgraded components at this time and we had to swap parts from our unserviceable parked aircraft in order to maintain the required amount of aircraft for the daily flying schedule. Our mindset at the time was to get the job done. Most of us technicians had been working on the fleet for more than 10 years and therefore knew the systems at a very in-depth level.

The squadron was deploying to Aviano, Italy and the aircraft had very specific timings to meet in order to liaise with the air-to-air refueller. During the launch of the aircraft, one aircraft had a radar antenna snag. As the senior CRS on shift at the time, I immediately approached my Warrant Officer with a plan to fix the aircraft so that the pilot could meet his timings. It had never been done before, but they trusted my experience and told me to go for it. I directed two technicians to rob the compatible part from an unserviceable aircraft and one of my fellow Master Corporals completed the paperwork.

"Fixing a radar system while the aircraft was running... what was I thinking? The "get-the-job-done" mentality could have gone very badly for us that day."

I then proceeded out to the running aircraft with an intercom cord and headset. I connected to the aircraft and discussed with the pilot my intentions to fix the aircraft while it was running. He asked if I was sure that this could be done and I assured him that I knew the systems and which circuit breakers to pull in order to isolate the radar system from the running aircraft. I directed the pilot to shut down the left engine and, once that was completed, I opened the aircraft panels to access the circuit breakers. I pulled the applicable breakers and lowered the boarding ladder. At this time, the two technicians arrived on site with the new part and we performed the maintenance required to make the aircraft serviceable. We signed off the paperwork, the pilot re-signed for the aircraft and then managed to meet his timings with the refueller. We received many accolades for our actions on the flight line that day.





Fixing a radar system while the aircraft was running... what was I thinking? The “get-the-job-done” mentality could have gone very badly for us that day. Second and third order effects could have been devastating; we could have shorted out the generator system, radar system or even lost the aircraft plus all personnel in the area. CF188 dual redundancy could have been our downfall. Since that day, I have changed my thought process about getting the job done. I always keep this event in the back of my mind when I’m challenged and I always consider the other potential effects for the decisions I make.

Editor’s Note:

The concern raised by this article is timely in that it highlights the dangers while operating in close proximity to running aircraft.

In May 2017, there were two flight safety occurrences with personnel approaching/entering CF188 danger areas, putting themselves at risk of being ingested into the engine intake. We have already lost one person in this fashion when, in 1986, a civilian refuelling truck driver was ingested into the right hand engine intake of a CF188 (FSIMS 33533).

We know people are busy, people are pressed for time, and most importantly people mean well when these incidents occur (e.g. wanting to deploy the ladder for the pilot), but we need to be careful.

This on-going issue triggered a Flight Safety FLASH in 2016 and a re-issue this past May. It has been an important topic on this year’s Directorate of Flight Safety Road Show.

Please make sure that all personnel are careful and aware of the dangers when working in the vicinity of any running aircraft. ⚡



Hit the Deck

by Sergeant Paul Lloyd, 442 Transport and Rescue Squadron, Comox

For a CH149 Cormorant crew at 442 Transport and Rescue Squadron, one of the most difficult hoisting missions, is taking a person off of a boat in the open ocean. It takes a lot of training to accomplish this sequence and must be practiced often to maintain this skill.

I was part of the standby crew on a training flight that was underway to conduct a boat hoist sequence as part of a proficiency check to upgrade a pilot to aircraft captain (AC).

From Comox we flew to the Coast Guard station at Bamfield, on the west coast of Vancouver Island, to meet the Coast Guard Cape Class rescue boat. The boat was already outside the inlet and the sea state was high enough to be bouncing the boat around quite a bit. We set up into wind and started the practice approaches to get the helicopter into a stable hover over the moving boat. The intent was to hoist a search and rescue technician (SAR Tech) to the stern of the boat where he would then guideline the rescue

basket to the boat deck. A Cape Class boat is unique in that it has a very small stern deck area directly behind a tall crew cabin with large antennae on it. This makes it very challenging for the flying pilot as they must be low to have a good visual reference but that puts the antennae very close to the helicopter when it is above the stern of the boat. After a couple of practice approaches, it was clear this would be a difficult hoist due to the high wind and waves.

"I decided to hook up to get the hoist done. As you can guess, it did not go well. The approach to the boat was too fast and I struck the rear of the boat's cabin."

I was one of the SAR Techs in the crew and at that time was a Restricted Team Leader. I would be the first SAR Tech on the hoist and I would make the decision whether it was safe to conduct the planned training hoist.

The initial practice approaches had not gone well enough to give me the usual confidence I feel when getting on the hoist hook.

Normally, to improve results, we might have done a few more practice approaches with the flight engineer (Flt Engr) sending out an empty hook or a weighted bag to simulate a SAR Tech on the hook. Another option was for the boat to motor towards calmer water in the bay. But both of these options took extra time and we were under a time constraint. At that time the Cormorant had problems with cracks in the tail rotor and 1 Canadian Air Division had ordered a 2 hour time limit on training flights so the tail rotor could be visually inspected every 2 hours. With our transit time and the other training objectives needed for the AC upgrade it didn't leave much time to get this boat hoist accomplished.



Photo: Pte Dan Moore

I decided to hook up to get the hoist done. As you can guess, it did not go well. The approach to the boat was too fast and I struck the rear of the boat's cabin. Then, as the pilot reacted to the Flt Engr's conning correction, the helicopter reversed and I flew back into the rear bulkhead of the boat. As I slumped to the deck, I tried to pull my quick release to get off the hook but I was pulled over the bulkhead into the ocean and then pulled under water at 8 to 10 knots. The Flt Engr was paying out cable and I was now able to disconnect from the hook. I did a quick body systems check and found I was still functional. I called for a pick up and the Cormorant moved in to hoist me out of the water.

I was lucky to have only received soft tissue injuries but I was not fit to be operational for the rest of our standby day. We returned to base and, while enroute, I learned the Cormorant had struck the boat's large antenna causing damage.

During my recuperation, I had time to analyze the incident and figure out if I should have done something differently. It was only seconds from the time I was about to hit the deck to when I was in the water, so I couldn't have done much differently on the hook. My decision to go ahead with the live hoist was the issue. The time constraint had put pressure on the whole crew and I felt compelled to do the hoist so the AC upgrade wouldn't be delayed. The 2-hour time limit could not be changed but we could have planned a more realistic flight profile. The upgrade flight could have continued with other types of assessments or been pushed to another day.

As the standby crew, we have to train but our real job is to be ready for a search and rescue mission. By going ahead with a risky hoist we compromised our ability to do our actual job that day. 📌



Photo: MCpl Johanne Maheu

Turbulence Happens

by Corporal Grace Pereira, 437 Transport Squadron, Trenton

As an aviation systems technician, I could probably draw on a couple of near miss situations that I have witnessed or been party to in regards to potential flight safeties. These days, however, I'm on a temporary voluntary occupation transfer to 437 Squadron as a flight attendant.

Ahh, the holidays, the hustle, bustle, and cheer. Many of us at the squadron choose not to take leave during this time so that we are available to fly other service members home to their families. These are gratifying yet some of the most stressful flights we do here.

We arrive at 05:00 at the squadron for a 07:00 take off. It's a chilly morning, the thermometer is reading -17 degrees Celsius with wind gusts up to 80 km/h. The fleet has been stowed, pre-flight and crew briefs completed with a call for possible turbulence throughout the flight. The passengers are loaded, over wing able-bodies briefed, cabin secured and de-icing completed. We are now rumbling down the runway, the airplane tilts back and the main landing gear lifts off of the ground. My stomach is momentarily weightless and a small grin appears on my face... oh, how I love airplanes.

At the top of the climb, we are ready to serve passengers the first meal on this five leg journey. Armed with our aprons and carriers,¹ we are in the aisles offering our wares to the 144 passengers on board today. As I release the brakes on the carrier to move it forward towards the next passenger, we suddenly enter an area of turbulence. I lose my balance.



Photo: Cpl Tom Parker

Instinctively, I grab the handrail on the overhead bin with one hand while I grab the carrier with the other. I come very close to being seated in a young gentleman's lap along with his meal. Luckily, the carrier catches on an armrest preventing any further forward motion. Thankfully no one is injured.

"I lose my balance. Instinctively, I grab the handrail on the overhead bin with one hand while I grab the carrier with the other. I come very close to being seated in a young gentleman's lap along with his meal."

On 30 March 2016 this scenario repeated itself on an American Eagle Flight 3,358 and the outcome wasn't nearly as positive. Two cabin crew are hospitalized after severe turbulence sent a beverage cart crashing into the jet's ceiling.

Flight safeties can also happen in the cabin area, passengers and personnel can be injured as well as aircraft and equipment be damaged. ⚠

Reference

1. Meal carrier dimensions 34" (L), 14" (W), 41" (H), 60 lbs empty weight, loaded it can vary from approximately 150 to 350 lbs.

Big Hair Flight

by Captain John McCullough, Base Flight Safety Officer, Suffield

I had made the trip from the interior of Bosnia out to the city of Split on the Dalmatian Coast numerous times without incident or any apprehension as a passenger on a British Sea King. This sense of calm and relaxation was to change one spring morning in 1995 as I awaited the departure from Kiseljak. The British air and ground crew had a definite air of giddiness and anticipation for this flight. Curiosity got the better of me and, as the lone Canuck waiting in the wings, I sauntered over to the pilot and inquired as to what was brewing that morning. From their manners I thought it might be big and, if I was not to grasp the importance of the excitement, I would fake acknowledgment. I would be like a tourist feigning that I had just understood the directions while in fact not understanding a damn word spoken. As advertised, I failed to comprehend the response and so I just smiled and nodded and gave an "ah Bach" type acknowledgment, still without out a clue of who my fellow passengers were and how this aircrew would soon try to impress them.

When the vans pulled up out popped this 1980s big hair band that at the time was a big deal. I did my best Canadian impression of expressing niceties without knowing the white knuckle ride that awaited me.

"When the vans pulled up out popped this 1980s big hair band that at the time was a big deal. I did my best Canadian impression of expressing niceties without knowing the white knuckle ride that awaited me."

Once strapped in and seated, the band all immediately gathered around the doors in order to peer out at the Bosnian country side as it passed beneath us. For the most part, we were almost able to touch the Bosnian mountains as they swept past us.

It was not long into the flight when I knew this would be a white knuckle flight from lift off to touch down. The grown adult rockers with foot high hair bounced around and screamed in joy at the daring flight while the flight crew all nodded and smiled at each other in expressions of satisfaction. I did my best to contain my posture of calm and thoughts of "what the hell" until we touched down. As the helo came to a stop and the doors slid open, I repeated to myself "walk calm... act unimpressed." When the crew yelled out if I wished a photo, I just kept walking and, without breaking step or looking back, gave a wave of indifference thinking "If I were to ever be spread across a mountain side, at least Lord, let it be for country." 🇦🇩

Photo: Sgt Norm McLean





Photo: MCpl Robert Bottrill

Shortcuts

by Master Corporal Shawn Murphy, 413 Transport and Rescue Squadron, Greenwood

With a late-in-the-season posting to the 431 Snowbirds Air Demonstration Squadron in early November, the good old prairie winter was in full swing. Having some previous CT114 Tutor experience, the transition to a new unit was relatively easy. I just put on lots of clothes to stay warm and my days were busy looking after up to nine aircraft at a time. Yes, the Snowbirds like to fly and they fly a lot in the winter.

It was on one of those days when the snow was blowing across the ramp sideways and everyone walked with their heads down so not to be instantly turned to ice by the frigid wind chill. As the new guy, it was my turn to fuel all the aircraft; a long process of climbing up onto the wing and being pounded by the wind, plane after plane. That day, I saw something new, something I had never seen before, something that happened because of shortcuts.

"Like a graceful figure skater, the next aircraft was performing a beautiful slow motion spin that ended in a perfect wingtip to wingtip stop."

I was up on the wing, leaning over the fuel hose, holding my hood down as low as I could to protect my face from the wind when I noticed the fuel stop flowing. I thought, "Great, why is this thing not working?" It took a couple of seconds to realize that the fuel tender driver was screaming! A quick glance over and I saw the driver pointing toward the next aircraft in line. Like a graceful figure skater, the next aircraft was performing a beautiful slow motion spin that ended in a perfect wingtip to wingtip stop. Yes, that plane and the one I was fueling decided to hold hands or wingtips in this case.

"That was crazy," I remember saying out loud...not that anyone could have heard me in the winter wind. I had never seen a plane jump chocks and spin around in the wind. How could this possibly have happened? Well, if you undo the nose wheel steering and only chock the nose instead of both main wheels during your pre-flight check of a plane that has yet to be fueled during a winter storm, this might be the result. In this case the deviation from standard procedure resulted in minor damage and no injuries but the potential was there for a more serious incident.

What was intended to be a little, innocent time saver ended up costing a lot of hours in repairs and paperwork.

Seeing two planes hit each other is something that will forever remind me that short cuts can have negative consequences. ♦

From the Investigator

TYPE: CF188747

LOCATION: Cold Lake Air Weapons Range

DATE: 28 November 2016

Call sign “Swift 32”, in aircraft CF188747, was part of a two-ship formation led by “Swift 31” for an unopposed air interdiction continuation training mission. The mission objective was to deliver two MK83 inert bombs followed by two Laser Guided Training Rounds (LGTR), simulating laser guided bombs, in the Cold Lake Air Weapons Range. To avoid the simulated bomb fragmentation after dropping their bombs each pilot would fly a “safe escape maneuver” comprising a 5 g level turn (which requires a 78 degree bank angle to maintain level flight) through 90 degrees of heading change.

The formation departed Cold Lake Airport (CYOD) and proceeded at low altitude under Visual Flight Rules (VFR) to the target area, approximately 90 km east of CYOD. The accident occurred on the third weapons pass over the target, with Swift 31 flying about 2 miles in trail of Swift 32 and lasing the target for Swift 32, who dropped an LGTR. The ingress to the target was flown at approximately 500 feet above ground level (AGL) to stay clear of an overcast cloud layer based at approximately 800 to 900 ft AGL.

Based on Air Combat Manoeuvring Instrumentation (ACMI) data, Swift 32 released his LGTR then initiated the safe escape maneuver at about 450 ft AGL, entering a 5.6g left turn and rolling left to a bank angle of 118 degrees. The aircraft initially gained 50 feet of altitude before the nose of the aircraft began to slice towards and then below the horizon, eventually reaching a flight path angle (FPA) of minus 18 degrees.

The aircraft then began rolling right and the bank angle reduced to 77 degrees left bank, and the FPA reduced to minus 15 degrees just prior to ground impact. Swift 31 saw the explosion, confirmed visually that Swift 32

had crashed, noted a parachute at the side of the ground scar and transmitted a Mayday call, which was relayed to CYOD air traffic control by another flight of CF188s. There were no radio transmissions from Swift 32, he did not eject and was fatally injured when the aircraft struck the ground in a descending left turn.

The investigation is continuing to examine all the operational and technical factors that may have played a role in the accident. ⚡



From the Investigator

TYPE: Harvard II CT156105

LOCATION: 13NM southwest of Moose Jaw

DATE: 27 January 2017

A CT156 Harvard II was operating out of 15 Wing Moose Jaw SK, with a two pilot crew from 2CFFTS. The mission was an instructional flight to practice visual sequences including basic aerobatics.

The two crew members consisted of a qualified flying instructor (QFI), who was monitoring from the rear seat, and a student pilot (SP) in the front seat, who was the pilot flying.

During the pull up into an aerobatic sequence, the QFI was not satisfied with the maneuver's progress and instructed the SP to recover. The QFI expected the SP to execute a nose high unusual attitude recovery, however, the SP selected the power control lever (PCL) to idle as per the inadvertent departure from controlled flight checklist. The QFI then took control of the aircraft and selected the PCL to full power, to continue with a nose high unusual attitude recovery.

Due to the initial nose high attitude and the reduction of the PCL to an idle power setting, the airspeed dropped to 75 knots. The QFI then brought the PCL back to idle to reinitiate the inadvertent departure from controlled flight checklist. As the nose dropped to below the horizon, the QFI continued with a nose low recovery.

A low oil pressure caution, followed by an engine CHIP light, illuminated on recovery and coincided with degraded engine performance. With the aircraft below a forced landing glide

profile for a return to base, an attempt was made to climb to an altitude where such a glide would be possible. The attempt was unsuccessful, and the engine performance continued to degrade, leading the crew to carry out a controlled ejection. One crew member sustained minor injuries during the ejection, and the aircraft was destroyed in the subsequent ground impact.

The investigation is focusing on human factors, mechanical factors, as well as training. ⚡



Photo: DND

Photo: DND

From the Investigator

TYPE: CC130338 SAR Technician

LOCATION: Yorkton, Saskatchewan

DATE: 8 March 2017

The accident occurred during a 435 (Transport and Rescue) Squadron CC130H Hercules search and rescue (SAR) training mission. The aircraft departed Winnipeg with a crew of nine and proceeded to the Pelly / Kamsak area in Saskatchewan to complete basic SAR sequences, and then transited to the Yorkton airport (CYQV) with the intent of doing live static line parachute jumps followed by supply drops.

The aircraft was established at 2,000 feet above ground in level flight at 120 knots indicated airspeed in a flap 50 configuration and flown into wind over the desired target. The skies were clear, it was -16°C and the surface winds were out of the northwest at 19 knots gusting to 24 knots. After completing their briefings and safety checks, the SAR Tech Team Leader (TL) exited the aircraft via the open rear ramp at their pre-determined point. The TL exited using the "ball" style technique. The SAR Tech Team Member (TM) followed a few seconds after the TL, except he used the "reverse arch" exit technique. Both the ball and the reverse arch are authorized exit techniques for static line jumps.



As the TM exited the aircraft his left leg was observed to move upwards and his body to roll slightly to the right. As this was happening the static line system began to deploy his parachute. The parachute did not open normally and the right side of the canopy was observed to be lower than the left side. He quickly entered a tight clockwise descending spiral.

The TM was observed to make movements similar to those used to untwist parachute lines and quickly released his SAR-PELS (an equipment bag attached at chest level to the front of his harness). His hands were again

observed to move up to the risers. The right spiralling rapid descent continued to the ground. The TL landed as quickly as he was safely able to and as close to the TM as he could and immediately performed first aid. Immediate life saving actions were not successful as the TM had been fatally injured on impact.

Detailed examination of the parachute did not reveal any evidence of a materiel failure and the investigation is focusing on human factors, including training and emergency procedures. ↗

Epilogue

TYPE: CP140103
LOCATION: Greenwood, Nova Scotia
DATE: 27 August 2015

The CP140 was taking off from 14 Wing Greenwood, Nova Scotia, on a transit mission to Iqaluit, Nunavut, in support of Operation (Op) QIMMIQ. Thunderstorms had recently passed over the airfield and the runway surfaces were wet.

During the takeoff roll, the crew observed a flock of birds flying towards the runway. Perceiving a conflict and concerned about the risk of collision, the aircraft commander called "Malfunction" and the pilot flying aborted the takeoff. During the abort procedure, the pilot flying the aircraft rapidly selected full reverse on all four propellers. Both propellers on the left side of the aircraft went into full reverse; however, both propellers on the right side of the aircraft continued to produce forward thrust, resulting in asymmetric thrust pushing the aircraft left of the runway centreline.

The crew was not successful at keeping the aircraft on the runway and it departed off the left side of the runway, approximately 1000 feet before the departure end. The propellers contacted a runway distance marker and a precision approach path indicator (PAPI) light.

The aircraft plowed through the soft earth and the nose gear collapsed, causing the inside propeller on the right side of the aircraft to strike the ground and break away from the engine. After the aircraft came to a stop, all personnel on board exited the aircraft safely; only minor injuries were incurred.

The investigation examined human factors, the takeoff abort procedure, and the technical serviceability of the aircraft. No aircraft technical faults were discovered. The investigation recommended changes to procedures for the CP140 takeoff abort procedure, safeguarding CVR data, and the cockpit shoulder harness inertial reels. The investigation also recommended making improvements to the runways at 14 Wing in order to minimize the chance of hydroplaning. ⚡



Epilogue

TYPE: Polaris CC15004
LOCATION: Op IMPACT
DATE: 8 May 2015



On 8 May 2015 at 1510 local (L), the CC150 Polaris departed its base of operation for an air to air refueling mission in support of Operation IMPACT (Op IMPACT). Upon successful completion of the mission the crew commenced their return home. Approximately 4 hours into the flight and 1 hour and 15 minutes from landing, the crew felt a significant, sudden vibration lasting approximately 3-4 seconds, and was felt in the control column, rudder pedals and throughout the entire aircraft. The crew checked all aircraft system pages on the Electronic Centralized Aircraft Monitoring (ECAM) system and nothing unusual was found.

The flight continued without further incident and landed safely at 2024 (L). Upon landing, an exterior inspection revealed disbonding and in-flight departure of a portion of the right

elevator trailing edge. Damage was assessed as minor. Fourteen months following the original occurrence, two additional elevators sustained disbonding without separation of any portion of the elevator from the aircraft; these were also assessed as minor damage.

The investigation determined that high surface temperature, due to the dark paint scheme, and moisture ingress affected the properties of the structural adhesive between the elevator skin and honeycomb core to an extent such that disbonds occurred under normal operation.

A number of preventive measures have already been taken on the CC150 Polaris fleet, including: the application of a new light-color paint scheme on composite surfaces to minimize heating, increased frequency of elevator inspection, and revision of the preventive maintenance program to include X-ray on a regular basis as well as ensuring the condition of the sealant is part of each elevator inspection. In addition, a study on the potential effect of dark paint on the current RCAF inventory is in progress, along with a process review to ensure that a similar situation is not repeated. ⚡

Epilogue

TYPE: Harvard II CT156115
LOCATION: Hillsboro, Oregon
DATE: 12 February 2016

Two Harvard II Instructor Pilots (IP) from 15 Wing Moose Jaw (IP1- front seat and Aircraft Commander, IP2 - rear seat) were conducting a night cross country proficiency flight to Hillsboro Airport in Oregon, USA.

On final approach to Hillsboro Airport, IP2 selected the landing gear down and noticed the Nose Gear (NG) and Right Gear (RG) indicated down and locked, but the Left Gear (LG) did not indicate down and locked. A low approach was flown, and a climb was initiated in order to trouble shoot the landing gear problem.

With the landing gear selected down the pilots noted that the Angle of Attack (AOA) indexer lights did not illuminate, (a secondary way to confirm gear down and locked). The pilots were not able to ascertain if the landing light or taxi light were illuminated (a tertiary way to confirm gear down and locked). The pilots did confirm the landing gear circuit breakers (CB) were in. The pilots then performed a landing gear lamp test for the NG, LG and RG, and observed all landing gear lights tested serviceable (three green) in both front

and rear cockpits. The landing gear was cycled up, then down, resulting in the same unsafe LG indication.

The Landing Gear Malfunction Checklist (LGMC) was completed in its entirety with IP2 reading the LGMC while IP1 flew the aircraft and carried out the actions, but at no time did the LG indicate down and locked. As per the LGMC, the landing gear was then cycled up, and all gear did indicate up and locked. In such situations, the LGMC recommends a gear up landing.

IP2 made an emergency call to Portland Approach Control who then alerted emergency services. IP1 flew the gear up landing in a full flap configuration, and during the flare the Power Control Lever (PCL) was selected to off to reduce both propeller and engine damage. The landing was completed successfully at Hillsboro airport.

The aircraft slid 1050 feet down the runway before coming to a stop. IP1 and IP2 egressed the aircraft while emergency services arrived on scene.

The investigation determined that the LG uplock switch failed internally, preventing completion of the electrical circuit to ground. A failure of this switch in the open position would not allow a LG down and locked indication, even though all gear were down and locked.

Harvard II main landing gear uplock switches are not tested periodically for electrical continuity via a resistance check, nor are they replaced after a specified period of time or number of landings. The investigation recommends that the Senior Design Engineer develops a strategy to address main landing gear uplock switch failures. ⚡



Royal Canadian Air Force Commander's Commendation Awarded to Major Tyler Brooks

On 16 May 2017, the Directorate of Flight Safety's flight surgeon, Maj Tyler Brooks, received a Royal Canadian Air Force (RCAF) Commander's Commendation from Lieutenant-General Hood for showing decisive leadership and unparalleled initiative that were instrumental in developing the Fatigue Risk Management System (FRMS) for the RCAF.

His professionalism and unique breadth of operational and medical experience enabled him to tailor the aviation industry-developed FRMS to serve essential RCAF operational requirements. His determined efforts helped to reveal the impact of fatigue to aviation safety, and through the use of innovative real-world case studies, he demonstrated the benefit of a FRMS in the RCAF.

Maj Brooks' remarkable foresight and unmatched dedication truly personifies the core values of the RCAF: Professionalism, Excellence and Teamwork. ✦



Left to Right: Lieutenant-General Hood, Commander RCAF; Major Brooks; Chief Warrant Officer Poitras, RCAF Chief Warrant Officer