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Flight Comment

ISSUE 1, 2026

CHECK SIX
A Former Air Cadet's Reflections

DOSSIER
Controlled Flight Into Terrain

LESSON LEARNED
Recognizing One's Limits

SCAN TO VIEW ONLINE

Canada

Cover – A Royal Canadian Air Cadets SZ23 glider is on short final for the glider field in Saint-Jean-sur-Richelieu, Quebec, July 2022.

Photo: Royal Canadian Air Cadets

Photo: CAF

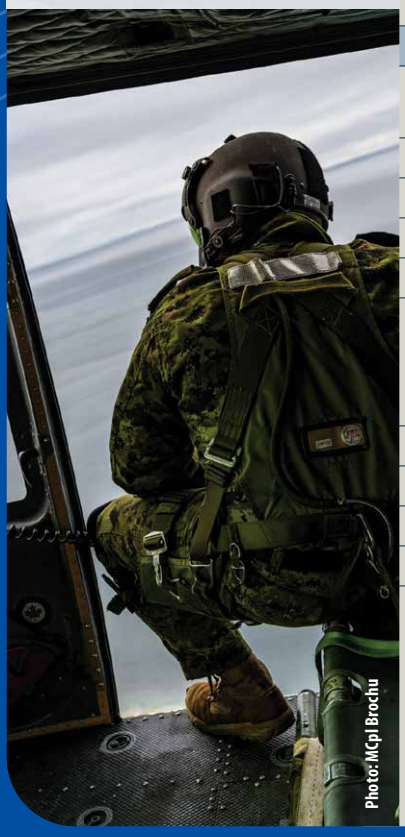

Photo: MCpl Brochu

Flight Comment

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Photo: Cpl Hamilton

Views on Flight Safety

by Brigadier General Dominique Brais, Commander CJCR Group

Every aviator remembers a moment when aviation stopped being abstract and became real: the instant when preparation, judgement, and consequence converged. Sometimes it happens in the cockpit, sometimes it happens long before. What matters is not the aircraft or the rank worn at the time, but the lesson learned: flight demands respect, discipline, and an unwavering commitment to safety.

As an Air Combat Systems Officer on the CP-140, I learned early that at its core, flight safety culture goes far beyond regulations, checklists strapped to a kneeboard, and hazard or incident reporting. It is a mindset. Shaped early, reinforced often, and carried forward across an entire career, Flight Safety is how you show up, how you prepare, and how you look after the people around you.

For many CAF members, the foundations of flight safety were laid long before they ever logged hours in a military cockpit. Those lessons often began years earlier, as a young Air Cadet in blue flight suit, feeling the vibration of an aircraft or the tranquility of a glider for the very first time. Over my own years spent in both operational flying and training environments – and now responsible for more than 8,000 CAF members, civilian instructors, and volunteers who deliver the Cadets and Junior Canadian Rangers programs to nearly 70,000 youth across Canada – I have seen firsthand how early exposure to aviation culture shapes the way young people assess risk, make decisions, and respond when conditions change. The mindset they develop in those formative years helps forge the aviators, technicians, and leaders they become.

This is where the Cadet Program's contribution intersects directly with the interests of the CAF and Canada. By offering young people structured challenges, meaningful responsibility, and leadership opportunities guided by trusted mentors, the program helps cultivate citizens who are comfortable operating in complex environments, who understand accountability, and who appreciate the importance of collective responsibility. The Air Cadet Flying Program doesn't just teach youth how to fly, it teaches them how to think, how to lead, how to communicate, and how to approach complex situations with clarity and composure. These attributes matter in aviation, in military service, and in life.

For many CAF personnel, the Cadet Program represents their first exposure to the excitement of flight, aerospace education, and to the structured responsibilities that accompany aviation. This is why the Air Cadet Flying Program occupies such an enduring and meaningful place in our aviation ecosystem and deserves attention within our broader flight safety conversation.

What I see in the Air Cadet Flying Program is not just that early introduction to aviation, it is an initiation into our culture. A culture that prizes preparation, communication, humility, and respect. A culture where individuals learn to think ahead, identify hazards, and make decisions that matter. A culture that relies on teammates but does not abdicate personal responsibility, and one in which speaking up when something doesn't feel right is understood as professional integrity rather than a challenge to authority. These are the core principles of a safety ethos that follow cadets into every aircraft they fly and into every team they will eventually lead. But whether they become pilots, technicians, operators, or simply stronger, safer citizens, the foundation remains the same; they care about doing things the right way.

In the end, across more than 450 Canadian communities, the Air Cadet Program is much more than an introduction to aviation. It is one of Canada's most effective builders of judgment, confidence, resilience, and leadership; cultivating the kind of Canadians who keep themselves and others safe whether in a cockpit, in a classroom, on a mission, or in their communities.

Photo: Cpl Hamilton

The Editor's Corner

by Major Courtney Douglass, DFS 3-3

Welcome to the spring edition of Flight Comment magazine. After a long winter it's exciting to be thinking of warmer weather and the start of the summer flying season. The Air Cadet Flying Program will kick off its 2026 season soon. Young people from across the country will get to return to flying or experience their first thrill of flight at the controls of an aircraft or glider. They'll feel both the excitement and the responsibility of being in control of an aircraft or glider, just as many Canadian Armed Forces (CAF) pilots flying operational aircraft around the world do.

This edition of Flight Comment includes a Lesson Learned article by Cadet Warrant Officer First Class Mattheo Di Maulo. What struck me about this article is how similar his experience is to that of a CAF pilot: the need to anticipate hazards such as weather, the importance of the pre-flight briefing to evaluate risk, knowing when to speak up to voice concerns and the ability when something goes wrong or something unanticipated happens to fall back on training. Whether it be operating a single pilot aircraft, glider or flying as part of a crew understanding these things embody what it means to be a professional pilot working or flying in a professional organisation. It's wonderful that this attitude and culture are taught so early in an aviation career.

This edition also includes an article about a young cadet in 1946 and his experience watching pilots return from World War II. He notes just how young these veteran combat pilots were, some not much older than the cadet himself. He speaks about an accident he had heard about involving these pilots and how even at his young age, it was something that remained with him throughout his life, influencing how he would later approach his work at Canadian Pacific Airlines. It strikes me again how experiences in our youth can remain with us and shape our future.

This edition also includes an article related to the First Air crash of a Boeing 737 that occurred in Resolute Bay, Nunavut, in August 2011. The article written by Honorary Colonel (HCol) Cathy Fox, the former Chair of the Transportation Safety Board and current HCol of 412 Transport Squadron, looks at the cause, the lessons learned and the real-world effect of such a devastating occurrence on a small community. The CAF had a unique experience with this event as personnel were already in Resolute Bay as part of Operation Nanook. Fifteen medical personnel, two CH-146 Griffon helicopters, and one CH-124 Sea King helicopter were first on the scene, extinguishing fires alongside Resolute Bay Airport firefighters and providing aid to the three survivors who were later transported to Iqaluit by a CC-177 Globemaster III. The incident reminds us of just how quickly things can happen and how, as military personnel, the mission can change instantly. The author, HCol Cathy Fox, has recently been appointed by the Governor General to the Order of Canada for her vital contributions to transportation safety.

In reflecting on these stories which span generations and aircraft types we are reminded that aviation is a profession built on learning, sharing, and continual improvement. Whether it is a young cadet experiencing the responsibilities of flight for the first time, a former air cadet recalling lessons that shaped a lifelong career, or an experienced leader analyzing tragedy to strengthen safety, each perspective contributes to the collective wisdom that keeps our aviation community strong.

I hope you enjoy this edition of *Flight Comment*.

Photo: Cpl Hamilton

DFS Commendation

Outstanding professional long-term performance and dedication in the field of Flight Safety.

Major Corey Csada

Major Csada is awarded the Director of Flight Safety Commendation in recognition of his exceptional long-term performance and sustained dedication to the Canadian Armed Forces Flight Safety Program. Through more than nine years of service in senior Flight Safety appointments, Major Csada made enduring contributions that significantly enhanced operational safety, risk management, and Flight Safety culture at both the Unit and Wing levels.

Photo: Cpl Curtis

DFS Commendation

Outstanding professional long-term performance and dedication in the field of Flight Safety.

Captain Mary-Frances Zielinski

Capt Zielinski is commended for her outstanding professional performance and long-term dedication to Flight Safety (FS) within 3 Canadian Division. Over four years, she held multiple FS roles simultaneously, becoming the Division's cornerstone for FS capability and culture. In the absence of a Division FS representative, she assumed that responsibility while serving as 3 CDSB G3 Aviation, providing strategic FS guidance to the Division Commander and supporting all 3 Div bases. As CFB Edmonton Flight Safety Officer, she extended her expertise to lodger units and ranges across Western Canada. Through her professionalism, foresight, and unwavering commitment, Capt Zielinski significantly enhanced the FS Program across the CAF and exemplified the values and ethos of Flight Safety.

Photo: Lt Still

Awards

System for the Cooperation of the Air Forces in the Americas (SICOFAA) Award

Canada is a member of the international aviation association called Sistema de Cooperación entre las Fuerzas Aéreas Americanas. This Spanish designation translates to System for the Cooperation of the Air Forces in the Americas (SICOFAA). Each year, SICOFAA provides member countries with an opportunity to nominate a deserving unit within their respective air force. This unit must have demonstrated the highest level of dedication to the furtherance of Flight Safety and, through its actions, served as an exceptional example to others.

Photo: Cpl Bacon

2024 Winner — **AIR TASK FORCE — ROMANIA 22 (ATF-R 22) Flight Safety Team**

The 2024 SICOFAA Award is presented by Mr. Martin Leblanc (DFS Senior Investigator) and CWO Sebastien Robichaud (DFS CWO) to Maj Jean-Sébastion Otis and WO Steeve Martel-Vallée.

Photo: CAF

2025 Winner — **435 Transport and Rescue Squadron**

The 2025 SICOFAA Award is presented by LGen Jamie Speiser-Blanchet (Commander of the RCAF) and CWO Renee J. Hansen (Command Chief Warrant Officer) to Commanding Officer LCol Wes Cromwell, Capt Jim Turnbull, and MWO Paul Comeau.

A Former Air Cadet's Reflections on Lessons Learned

by Anne Gafiuk

Photo: William Cameron Collection

In the summer of 1946, at the age of 17, William Cameron was awarded an Air Cadet Flying Scholarship at the Regina Flying Club. He said, "Throughout that summer, the RCAF flew a large number of Fairchild Cornell aircraft to RCAF Holding Unit No. 201 at the airport at Estevan, Saskatchewan from Elementary Flying Training Schools (EFTS) of the British Commonwealth Air Training Plan (BCATP) in Manitoba, Saskatchewan and Alberta, bases that are now closed." The aircraft were stationed in Estevan before being flown across the border and repatriated to the United States.

He explained, "The Cornell was a low-wing, two-pilot elementary training aircraft that had been supplied in considerable numbers to the government of Great Britain, by the government of the United States, for use in the BCATP, under the 1941 'Lend-Lease' agreement between those two countries."

Dakota (also known as C-47) aircraft were often used to transport pilots and other aircrew back to the Canadian airbases to continue returning the lend-lease aircraft to the United States.

During a lend-lease run on September 15, 1946, flying from Minot, North Dakota back to Estevan, Saskatchewan tragedy hit. At 1020 hrs CST, the dispatching officer of No. 124 (Ferry) Squadron reported that Dakota 962 crashed upon landing at RCAF Station Estevan. All aboard perished in the fiery crash.

The aviation catastrophe made papers coast to coast, as well as internationally. It was considered the worst air accident since the end of the war.

The Court of Inquiry said it was difficult to determine what had transpired in Dakota 962 between takeoff and the crash but concluded Dakota 962 crashed on landing at RCAF Station Estevan because of loss of control due to an elevator control lock being in the locked position. The pilot was guilty of negligence in the performance of his duties, in that he failed to carry out a proper pre-flight check.

As a teenager, Cameron was just learning to fly. "During the two weeks of my flying course, I witnessed, on two occasions, the arrival and departure from the Regina airport of an RCAF C-47, carrying several RCAF pilots. I was tremendously impressed by the appearance of those young men. Most of them were Flight Lieutenants or Flying Officers, and almost all of them wore honours decorations below their pilot wings on their uniforms. There were many Distinguished Flying Cross ribbons, as well as ribbons for various theatres of war."

Cameron recollected, "Those men were in 'high spirits.' They had survived the horrors of wartime operations and were in a holiday mood as they went off to Estevan to fly Cornells across the border to the United States. Possibly some of them had learned to fly on those very same Cornell aircraft at a Canadian EFTS. Our small air cadet trainee group was in awe of those vibrant, young, veteran pilots. The pilots that we saw at Regina Airport in August of 1946 were either on their way to Estevan for the ferry operations, or having finished their assignment, were returning to Ottawa for discharge from the service."

Cameron recalled that, "A few weeks after the completion of the 20 hours of flight training at Regina Flying Club, I was shocked to learn about the crash of Dakota 962 at Estevan. It immediately occurred to me that the victims of that accident might well have been the same young men that I had so much admired at Regina Airport a few weeks earlier."

Photos: CAF

"Two years later, in 1948," recalls Cameron, "I became an employee of Canadian Pacific Air Lines Ltd. (CPAL) as a radio operator/agent. On those occasions, when a company aircraft was to remain on the ground overnight or was unattended for a long period in windy conditions, it was my responsibility at airports to which I was assigned, to place the elevator gust locks on the company DC-3s. The locks were put in place immediately after the aircraft arrived at the airport terminal and removed as soon as the pilots went to the cockpit, prior to start-up of the engines for departure."

Cameron said, "Knowing that the cause of the tragic accident of the RCAF C-47 at Estevan in 1946 was the failure to remove the elevator gust locks, it was a source of great comfort to me in carrying out these duties, to know that it was almost impossible for the gust locks used by CPAL to remain in place as the aircraft taxied away. Attached to each gust lock was a long, red canvas ribbon — easily seen — and a length of flexible cable, about four feet long, that was attached to a 10-pound metal ring. If the removal of the gust lock had been overlooked prior to the aircraft departure, the heavy weight lying on the ground would pull the locks from the elevators as the aircraft moved away."

Cameron remembered "how tragic that such a simple, inexpensive device had not been available for that RCAF C-47 departure from Minot, North Dakota, on that fateful day of September 15, 1946. I was overwhelmed by the seeming injustice of their death in peacetime, after having survived the many dangers of operational flying during the Second World War."

William Cameron passed away in October 2023. He retired from Canadian Airlines in 1986 as Director, North American Airport Operations. After retirement he was active in the Canadian Aviation Historical Society and Airline Retirees Association.

Anne Gafiuk, a former elementary school teacher, transitioned to freelance writing while raising her family. Her research into WWII RCAF pilots sparked a profound interest in vintage aircraft, the individuals associated with them, and their historical significance, taking her on a new flight of discovery. Anne is the author of five books and creator of three websites. For more information, please visit www.whatsinastory.ca

DOSSIER

The Safety Management System (SMS) and the CAF Flight Safety Program (FSP)

Photo: Cpl Brochu

by Col Steve Charpentier (Ret'd)

Anyone involved in aviation has heard the acronym SMS, the Safety Management System. But what does it truly mean, and how does it align with the Canadian Armed Forces (CAF) Flight Safety Program (FSP)?

This article explains the relationship between the two, clarifies why it matters, and highlights how SMS principles directly support safe and effective flying operations across the CAF.

ICAO and the Origins of SMS

The International Civil Aviation Organization (ICAO), a specialized agency of the United Nations, has long shaped global aviation safety policy by establishing harmonized international standards. One of ICAO's most influential contributions is the development of the Safety Management System (SMS), formally codified in Annex 19 Safety Management.

SMS introduced a transformative shift from reactive, accident-based responses to a proactive, structured, and data-driven approach to safety management. An SMS provides:

- Clear organizational structures and responsibilities.
- Defined policies and processes.
- Systematic hazard identification and risk mitigation.
- A culture of continuous safety improvement.

By embedding safety into planning, decision-making, and daily operations, SMS supports ICAO's overarching goal: continuous improvement in aviation safety.

SMS and Military Aviation: The CAF Context

Although ICAO standards do not apply directly to military aviation, militaries worldwide (including NATO members) have implemented equivalent frameworks. Within NATO, these principles are reflected in the Standardization Agreement (STANAG) 7160. Within the CAF they are embodied in the FSP.

The FSP serves as the CAF's formal structure for accident prevention and safe air operations. It is defined through the AGA 135 series of documents and includes three essential processes:

- Identifying actual and potential flight safety hazards and assessing associated risks.
- Developing and implementing remedial actions to maintain an acceptable level of safety.
- Continuously monitoring and evaluating the effectiveness of safety activities.

The Four Pillars of SMS and their FSP Equivalents

The SMS is built on four core pillars, all of which are fully reflected in the CAF FSP:

1. **Safety Policy and Objectives**
   Management commitment, clear safety goals, and defined responsibilities.
2. **Safety Risk Management**
   Hazard identification, risk assessment, and implementation of effective mitigation.
3. **Safety Assurance**
   Continuous monitoring and performance evaluation.
4. **Safety Promotion**
   Training, communication, and cultivating a positive, sustainable safety culture.

The AGA 135 series of documents aligns precisely with these pillars, confirming that the FSP is the CAF's SMS, adapted to military operations.

People: The Heart of an Effective SMS/FSP

The SMS is a process, but a process is meaningless without clearly defined roles, responsibilities, and accountabilities. The popular statement "Flight Safety is everyone's responsibility" sounds appealing, but in practice it is insufficient. Responsibility shared by all often becomes responsibility owned by none.

Accountability and Responsibility

A core SMS principle is the distinction between the two:

- **Accountable Person:** owns the risk and is answerable for safety outcomes.
- **Responsible Person:** develops and carries out the actions that manage risk.

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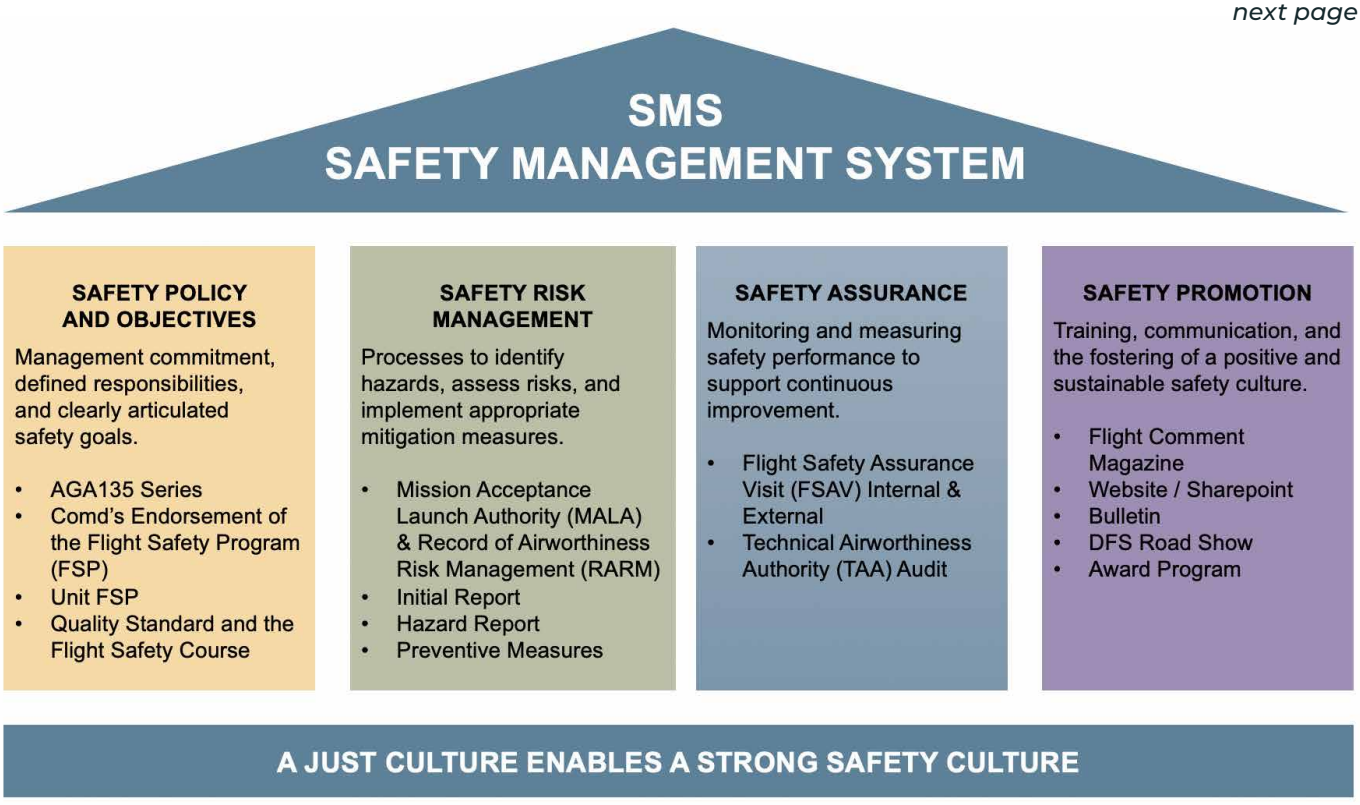

This separation ensures that strategic oversight is never diluted and that operational measures are implemented effectively.

SMS / FSP Roles and Responsibilities

Accountable Person — Unit Commanding Officer (CO) / Company Chief Executive Officer (CEO)

The Accountable Person holds ultimate ownership for the SMS. They:

- Own all safety risks.
- Allocate the required resources (people, funding, time).
- Ensure hazards are identified and mitigations are implemented.
- Remain accountable for system performance.

If errors recur in operations, the Accountable Person ensures corrective actions are investigated and implemented.

Responsible Person for Flight Safety — Unit Flight Safety Officer (UFSO) / Company Safety Manager

The Responsible Person:

- Operates independently with direct access to the Accountable Person.
- Manages, administers, and develops the SMS.
- Receives, analyzes, and acts on safety reports.
- Leads risk management activities.
- Tracks the effectiveness of preventative measures.

This role is advisory, not executive and requires strong trust, communication, and professional independence.

Responsible Managers — Flight Commanders / Section Heads

Responsible Managers:

- Manage day-to-day operational risks.
- Make operational decisions informed by risk.
- Implement preventative measures within their chain of command.

They are the operational core of SMS implementation.

Operators and Employees

Operators and employees:

- Identify hazards and report occurrences.
- Apply safety measures in daily tasks.
- Provide expert insight into operational risks.

A strong **Just Culture**, grounded in trust and transparency, encourages active participation.

Key Factors for an Effective SMS

1. Leadership Commitment

A strong safety culture must begin with leadership. This includes:

- Clear communication of priorities.
- Adequate resource allocation.
- Visible, consistent support for non-punitive reporting.
- Demonstrated commitment to safety as a core value.

Without leadership, an SMS cannot function.

2. Clear Organizational Structure

Everyone must understand their role. An effective SMS requires:

- Clearly documented responsibilities.
- An empowered, independent UFSO/Safety Manager.
- Defined accountability at all levels.

3. Strong Safety Reporting Systems

Reporting is the backbone of SMS:

- Easy, accessible, and non-punitive reporting tools.
- Anonymous reporting options when appropriate.
- Timely feedback on reported issues and actions taken.

4. Proactive Hazard Identification & Risk Management

Prevention is the objective:

- Systematic hazard identification.
- Authority appropriate risk reduction.
- Use of Flight Data Analysis (FDA) / Flight Data Monitoring (FDM) / Flight Operational Quality Assessment (FOQA) tools.
- Trend analysis of safety data.
- Tools such as Mission Acceptance Launch Authority (MALA) / Record of Airworthiness Risk Management (RARM), the Fatigue Risk Management System (FRMS) and the AMISAFE self-questionnaire.

5. Safety Assurance and Continuous Improvement

Includes:

- Regular internal and external Flight Safety Assurance Visits (FSAV).
- Compliance and airworthiness audits.
- Monitoring and implementation of preventative measures.

6. Safety Promotion and Training

Safety knowledge must be continuous:

- Initial and recurrent SMS training.
- Safety briefings, meetings, and newsletters.
- Leadership engagement and recognition of positive behaviours.

7. Just Culture and Transparent Communication

Safety thrives where trust thrives:

- Clear differentiation between error and acts of non-compliance.
- Open sharing of lessons learned.
- Cross-Unit collaboration.
- Protection of honest reporting.

The SMS is not an abstract concept, a civilian import, or an additional administrative burden; it is the structured expression of how the CAF manages risk in aviation operations. Through the FSP, the CAF has fully embedded the principles of the ICAO SMS and NATO STANAG 7160 into a military framework tailored to operational realities. The FSP is, in effect, our SMS.

An effective SMS does not prevent all errors, nor does it eliminate risk. Aviation, by its nature, involves inherent hazards. What the SMS does provide is a disciplined, proactive, and transparent means to identify these hazards, understand their risks, and manage them deliberately before they result in accidents. When properly implemented, it shifts safety from a reactive posture to a proactive and preventative one.

Success, however, depends on people. Clear command-level accountability, responsible operational management, engaged personnel, and empowered, independent flight safety leadership at every level are essential conditions for effectiveness. Without leadership commitment, a just culture, and open reporting, the SMS becomes a hollow framework rather than a living system.

Ultimately, the FSP exists to preserve combat capability by protecting our most valuable resources: our people, and our aircraft. Every report submitted, every risk assessed, and every preventive measure implemented strengthens operational effectiveness and mission success. Safety is not separate from operations; it is an enabler of them. When the SMS is understood, trusted, and actively used, it becomes a force multiplier that ensures the CAF continues to fly, fight, and win, safely and sustainably.

OUR FLIGHT SAFETY PROGRAM ENABLES MISSION SUCCESS

Photos: Sgt Morin

DOSSIER

Controlled Flight Into Terrain

HCol Kathy Fox has been a Canadian parachutist, commercial pilot, flight instructor, air traffic controller, and business executive. She served as a Member of the Transportation Safety Board of Canada (TSB) from 2007 to 2024 and was appointed Chair of the TSB from 2014 to 2024. She currently serves as the Honorary Colonel of 412 (Transport) Squadron, 8 Wing.

by Honorary Colonel Kathy Fox, 412 Transport Squadron

Transportation Safety Board (TSB) – Aviation Investigation Report

On 20 August 2011, a Boeing 737-210C combi aircraft was being flown as First Air charter flight 6560 from Yellowknife, Northwest Territories, to Resolute Bay, Nunavut with eleven passengers, four crew members, and freight on board. At 1642 Coordinated Universal Time (1142 Central Daylight Time), during the approach to Runway 35T, the aircraft struck a hill about one nautical mile east of the runway. The aircraft was destroyed by impact forces and an ensuing post-crash fire.

Eight passengers and all four crew members sustained fatal injuries. The remaining three passengers sustained serious injuries and were rescued by Canadian military personnel, who were in Resolute Bay as part of Operation Nanook. Canadian Armed Forces (CAF) members, including fifteen medical personnel, with two CH-146 Griffon helicopters and one CH-124 Sea King helicopter, were first on the scene, extinguishing fires along with Resolute Bay Airport firefighters and providing aid to the three survivors, who were later transported to Iqaluit by a CC-177 Globemaster III from 429 Transport Squadron, 8 Wing Trenton, ON.

The TSB, who coincidentally had several investigators enroute to Resolute Bay Airport (CYRB) on a military flight from Trenton to participate in Operation Nanook, arrived shortly after the accident. They immediately commenced a comprehensive investigation to find out why this accident happened. This article draws extensively from the final TSB Investigation Report A11H0002 available on the TSB's website.

The Flight

While enroute, the ceiling and visibility at CYRB had fluctuated as low as 200 feet above ground level (AGL) and ½ statute mile, although the 1600 weather observation reported to the flight crew read: wind 180°T at 8 knots, visibility 10 SM in light drizzle and overcast cloud at 700 feet AGL. No other weather observations were issued to the crew. The straight-in Instrument Landing System (ILS) 35T provided many benefits, with only an in-limits tailwind as a negative factor.

A special weather report for CYRB, issued after the accident at 1649, indicated: wind 180°T at 13 knots, visibility 5 SM in light drizzle and mist, and overcast cloud at 300 feet AGL, which was 100 feet above approach minimums. The ceiling at the airport at the time of the accident could not be determined. Although the visibility at the airport at the time of the accident is unknown, it likely did not decrease below approach minimums at any time during the arrival of the aircraft.

The TSB reported that the localizer was not captured and the flight continued on a heading that progressively deviated to the right of the localizer. As the aircraft deviated to the right, and despite instrument indications that the flight was substantially off the localizer centerline and a number of attempts by the First Officer (FO) to communicate the hazard, the Aircraft Captain (AC) continued the approach. Additionally, the approach was unstable in several parameters, and the flight continued beyond the point at which a go-around should have been conducted in accordance with company policy. A Ground Proximity Warning System (GPWS) alert prompted the crew to initiate a go-around, but this action was initiated too late to avoid impact with terrain.

Why did this accident happen?

The TSB investigation found that a number of factors contributed to this accident, including:

- The late initiation and subsequent management of the descent resulted in the aircraft turning onto final approach 600 feet above the glideslope, increasing the crew's workload and reducing their capacity to assess and resolve navigational issues which occurred during the remainder of the approach.
- When the heading reference was set during initial descent, there was an error of -8°. For undetermined reasons, further compass drift resulted in compass errors of at least -17° on final approach.
- As the aircraft rolled out of the turn onto final approach to the right of the localizer, the AC likely made a control wheel roll input that caused the autopilot to revert from VOR/LOC capture to MAN and HDG HOLD mode, which was not detected by the crew.
- On rolling out of the turn, the captain's horizontal situation indicator (HSI) displayed a heading of 330°, providing a perceived initial intercept angle of 17° to the inbound localizer track of 347°. However, due to the compass error, the aircraft's true heading was 346°. With 3° of wind drift to the right, the aircraft diverged further right of the localizer (Figure 1).
- Undetected by the pilots, the flight directors likely reverted to AUTO APP intercept mode as the aircraft passed through 2.5° right of the localizer, providing roll guidance to the selected heading (wings-level command) rather than to the localizer (left-turn command).
- The FO indicated to the AC that they had full localizer deflection. Although full deflection was an undesired aircraft state requiring a go-around, the AC continued the approach. The AC likely thought that he was controlling the aircraft through the autopilot and that the autopilot was navigating back to the localizer and onto the glideslope.
- As the approach continued, the pilots did not effectively communicate their respective perception, understanding, and future projection of the aircraft state. Complicating matters, each pilot was trying to solve a different problem. The AC was trying to solve the problem of intercepting the localizer and landing the aircraft, and the FO was trying to solve the problem of getting the AC to change his course of action and initiate a go-around. This meant that neither pilot was effectively communicating to resolve the situation.
- Given the AC's workload, he was likely experiencing increased stress. This stress would have made him susceptible to the influence of confirmation bias and attentional narrowing. This susceptibility would make it difficult for the AC to perceive and evaluate other cues such as those offered by the FO and other instrument indications (e.g., GPS position). It is likely that the AC did not fully comprehend information that indicated that his original plan was no longer viable. Although he likely understood the FO's go-around suggestion, the suggestion conflicted with the AC's plan to complete the approach and land. Therefore, the FO's suggestion would have been less desirable to the AC.
- The FO was task-saturated, and he thus had less time and cognitive capacity to develop and execute a communication strategy that would result in the AC changing his course of action. The FO's statements did not influence the AC's actions, likely because they identified parameters rather than consequences and required action. The FO's suggestion to go around was not sufficiently assertive at a time when an escalation of communication was needed and did not convince the AC to discontinue the approach. An example of language that identifies consequences and required action would be: "We are at risk of hitting the hill; we must go around."
- There was no company guidance provided to address a situation in which the pilot flying is responsive but is not changing an unsafe course of action. In the absence of clear policies or procedures allowing an FO to escalate from an advisory role to taking control, this FO likely felt inhibited from doing so.
- The crew initiated a go-around after the ground proximity warning system "sink rate" alert occurred, but there were insufficient altitude and time to execute the maneuver and avoid the collision with terrain.

Figure 1: The AC's Horizontal Situation Indicator (HSI), TSB Investigation Report (A11H0002)

Human Factors

Following an accident, people often want to 'blame' someone and may jump to premature

Continued on next page

conclusions such as "pilot error." The TSB does not assign fault or determine civil or criminal liability. Rather, investigators strive to understand why the crew's actions made sense to them at the time and why they made the decisions they made. In this case, the AC's desired course of action was supported by the following:

- his belief that the autopilot was in VOR/LOC with an intercept to the localizer;
- the apparent intercept angle displayed on the HSI;
- the flight director command bars commanding wings-level;
- his previous successful experiences in landing after conducting an instrument approach;
- his expectation to acquire visual reference;
- the fact that a go-around is typically initiated at the missed approach point.

The FO's desired course of action, a go-around, was supported by:

- movement of the HSI course deviation bar to full deflection;
- increase in track divergence despite the apparent intercept angle displayed on the HSI;
- GPS indications;
- unstable approach; and
- awareness of the terrain hazard to the right of the runway.

Tragically, this crew was unable to resolve their divergent mental models until it was too late.

Personal Reflections

At the time of this accident, I was a TSB Board member, vacationing on a small, chartered ship transiting the Northwest Passage westbound, having just landed at CYRB a couple of days earlier on a charter flight from Edmonton via Yellowknife with almost 100 passengers on board. The report of this accident, which we received while on the ship, hit us all very hard.

I had previously met three of the people on board the fatal flight (two of whom were killed) while traveling through Resolute Bay on earlier hiking trips to the Arctic. Of course, people in the Arctic depend on commercial air carriers – for critical supplies, as a local employer, and often as the only way in or out of these remote communities.

HCol Kathy Fox at the Resolute Bay Crash Site Memorial

In the immediate aftermath of this accident, rumors circulated in the community that somehow the military exercise had interfered with the airport's ILS leading to the crash or that the military air traffic controllers on site should have been able to warn the pilots that the aircraft was not properly aligned with the runway. The TSB investigation concluded that:

- There was no interference with the normal functionality of the ILS for Runway 35T at CYRB; and
- Neither the military tower nor the military terminal controller at CYRB had sufficient valid information available to cause them to issue a position advisory to the aircraft.

The TSB released its final report to the public on 25 March 2014. A day later the investigator-in-charge (a retired Canadian military pilot) and I traveled to Resolute Bay to brief the community on the results of the extensive TSB investigation. Emotions were still fragile in this small community that had lost so much. This occasion is one of the most memorable moments in my 17-year career at the TSB, to be able to bring long-awaited answers and hopefully some closure to those affected by this tragedy, and to visit the memorial at the crash site high on the hill overlooking the airport.

This investigation also led to a number of significant follow-up safety actions intended to advance aviation safety and to reduce the risk of such accidents in the future, which is the ultimate purpose of conducting TSB investigations. For more details on this occurrence, I encourage you to read the full investigation report available at the TSB's website (Aviation Investigation Report: A11H0002).

DOSSIER

Flight Safety Training Workshop 2025

Photos: Sgt Hardwick

The Directorate of Flight Safety (DFS) hosted the annual Flight Safety Training Workshop (FSTW) from November 4-6, 2025, in Gatineau QC. The workshop brings together Flight Safety Officers from across the spectrum of Canadian Armed Forces (CAF) operations to discuss current Flight Safety (FS) concerns as well as receive instruction on the latest techniques and procedures that govern the conduct of FS investigations. This year's workshop followed a slightly different format than years past, with a greater emphasis on participant interaction including working collaboratively to develop solutions to common FS concerns.

This year's participant list highlighted the growing importance of FS within the operations of the Royal Canadian Navy (RCN) and Canadian Army (CA) as the amount of Uncrewed Aircraft Systems (UAS) continues to grow within these services. One of the more eye-opening briefs was delivered by the CA and was related to the sheer volume of new UAS acquisitions and the potential challenges that poses in integrating with traditional crewed aircraft.

With planning already underway for the next workshop, we look forward to seeing everyone in the Fall of 2026.

Photo: Cpl Lovell

Lift The Dead:

Aerodynamic Principles Behind Asymmetric Thrust Handling in Multi-Engine Aircraft

by Major James Feagan, CD

Engine failures in multi-engine aircraft are high-stakes scenarios that demand immediate, disciplined responses. Whether in training or operational flight, the adage "Control, Power, Drag" remains the cornerstone of safe recovery. One of the most enduring pieces of advice to "raise the dead" or "lift the dead engine"is often taught early but not always deeply understood. This article explores the aerodynamic reasoning behind this practice and reinforces its universal applicability across all multi-engine platforms.

Understanding Asymmetric Thrust

When one engine fails, the aircraft experiences asymmetric thrust, causing a yawing moment toward the inoperative engine. This yaw is due to the imbalance in thrust vectors, and if uncorrected, it can lead to loss of directional control, increased drag, and potentially a departure from controlled flight.

Why We "Lift the Dead"

The phrase "lift the dead" refers to banking slightly toward the operative engine, thereby raising the wing on the side of the failed engine. This manoeuvre is not just tradition, it's rooted in aerodynamic necessity.

Improved Rudder Authority

Banking toward the live engine reduces the side-slip angle and aligns the relative airflow more symmetrically with the fuselage. This alignment reduces the yawing moment and allows the vertical stabilizer and rudder to work more effectively. With less rudder deflection needed, the aircraft maintains better control and avoids excessive drag from rudder input.

Minimum Control Speed (Vmc) Considerations

Vmc is the minimum speed at which the aircraft can maintain directional control with one engine inoperative. Banking toward the operative engine lowers Vmc, increasing the safety margin. Conversely, banking toward the dead engine raises Vmc, which can dangerously exceed the current airspeed, especially during climb-out or low-speed operations.

Drag Reduction

A sideslip caused by improper bank increases form drag and rudder drag, degrading climb

performance. Coordinated flight with a slight bank toward the live engine minimizes drag and maximizes lift and climb capability.

Lift Vector Optimization

Banking toward the live engine tilts the lift vector in a way that helps counteract the yawing moment. This geometric advantage stabilizes the aircraft and supports coordinated flight.

Control, Power, Drag: The Golden Triangle

In any engine-out scenario, the pilot must prioritize:

1. Control – Maintain aircraft attitude and directional stability. Use rudder and bank to counter yaw.
2. Power – Maximize thrust from the operative engine. Ensure proper configuration and avoid exceeding limitations.
3. Drag – Clean up the aircraft. Retract gear and flaps as appropriate, feather the dead engine, and minimize sideslip.

This sequence is not just procedural, it's aerodynamic logic. Control must come first, or power and drag management will be ineffective or even hazardous.

Universal Application Across Platforms

Whether flying a King Air, CC130, CC177, CP140, or a twin-engine jet, the principles remain the same. The physics of asymmetric thrust does not discriminate by airframe. Every multi-engine pilot must internalize these fundamentals to ensure safe outcomes in engine-out scenarios.

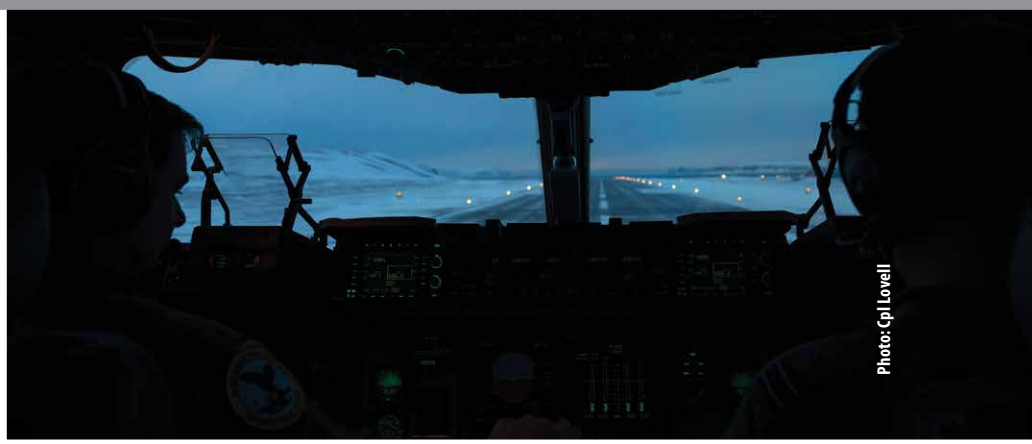

Photo: Cpl Lovell

"Lift the Dead" is more than a catchy phrase, it's a life-saving technique grounded in aerodynamic truth. By understanding the why behind the how, pilots can respond with confidence and precision. In the world of multi-engine flight, knowledge is power and power must be paired with control and drag management to keep us flying safely.

Real-world Accidents

King Air 350 – Addison, Texas (2019)

Engine failure during takeoff. The pilot did not maintain a proper bank toward the live engine, resulting in an uncontrolled yaw and roll. The aircraft crashed shortly after liftoff. Lesson: Slight bank toward the operating engine is essential to counteract asymmetric thrust.

Beechcraft Baron – Cowra, Australia (2024)

Simulated engine-out go-around. The instructor failed to maintain a bank toward the live engine, causing a roll toward the dead engine and terrain impact. Lesson: Proper bank reduces rudder workload and helps maintain control.

Piper PA-44 Seminole – Hillsboro, Oregon (2023)

During a Vmc demonstration, improper bank control led to loss of directional control and spin. Lesson: Even in training, failure to bank toward the live engine can quickly lead to loss of control. Proper bank reduces the amount of rudder required to maintain directional control.

Editor's Note:

The author speaks from experience as a multi-engine fixed-wing pilot. This article's goal was to discuss the aerodynamics behind engine-out operations. Individual fleet Standard Manoeuvre Manuals (SMMs) and Aircraft Operating Instructions (AOIs) should always take precedence.

Photo: Cpl Brochu

Photos: Capt Courtemanche

Recognizing One's Limits

by Cadet Warrant Officer First Class Mattheo Di Maulo

In the fall of 2023, during a solo glider flight, weather conditions deteriorated rapidly while I was already airborne. Surface winds at the aerodrome increased suddenly. At the time, I was flying solo with only four months of experience, having completed my glider pilot training the previous summer.

As the wind strengthened, turbulence became increasingly significant. Despite maintaining a nose-down attitude, strong vertical movements and powerful winds pushed the glider into the clouds, resulting in a temporary loss of visual references. Rather than reacting abruptly, I focused on the essentials: maintaining an appropriate attitude, coordinated flight, and a controlled airspeed. I applied the techniques learned during training to restore a safe situation.

After quickly exiting the clouds, the landing proved particularly demanding. The wind was variable and generated a crosswind component with which I was not accustomed to dealing. However, prior to the flight, my instructor had taken the time to brief me on the anticipated windy conditions and the techniques required to manage such situations. During the landing, he also guided me by radio to ensure I applied the appropriate attitude corrections. As a result, I was able to maintain control of the glider and land safely.

This experience allowed me to draw several important lessons. Winds can increase rapidly and sometimes without warning. Training, as well as a thorough preflight briefing on anticipated conditions, is essential when facing this type of situation. However, in hindsight, I realize that I could have simply communicated my discomfort to my instructor and cancelled the launch.

Today, I am much more aware of and attentive to changing weather conditions. I no longer hesitate to request additional briefings or guidance on the conduct of the flight prior to departure. I also understand the importance of speaking up if I do not feel comfortable with the conditions -because once the glider is launched, there is no turning back!

Good Show

For Excellence in Flight Safety

Corporal Ryan Klassen

Photo: Cpl Barrie

On 1 March 2025, while carrying out servicing and pre-flight duties in Yellowknife, Nunavut, Corporal (Cpl) Klassen (436 Sqn 8 Wing Trenton) demonstrated exemplary professionalism and vigilance that directly contributed to the safety of his crew and aircraft. During fueling and loading operations, their aircraft unexpectantly started to pressurize. At the same time, the Aircraft Commander (AC) was conducting an exterior inspection, approaching the nose of the aircraft and preparing to open the crew door and enter the aircraft.

Recognizing the immediate hazard posed by the pressurized aircraft and danger associated with opening the door, Cpl Klassen took swift and decisive action to forcibly hold the door latch closed. By preventing the door from opening under pressure, he effectively mitigated the risk of a potentially severe incident. His prompt response not only protected the AC from serious injury but also ensured the structural integrity of the aircraft was maintained. Following his intervention, the aircraft was safely depressurized, allowing the mission to proceed without further incident.

Cpl Klassen's actions directly prevented the loss of life or serious injury, and the potential loss or damage to an aviation resource. His quick thinking and technical proficiency reflect outstanding knowledge and judgment, demonstrating superior situational awareness in a critical moment. This action exemplifies the highest standards of the Royal Canadian Air Force (RCAF) Flight Safety program and sets a benchmark for all members.

This award recognizes his courage, professionalism, and unwavering commitment to safeguarding the lives of his fellow crew and the mission. Cpl Klassen is most deserving of the Good Show Award.

For Professionalism

For Commendable Performance in Flight Safety

Captain Shad Lebovitz

Photo: CAF

Following three flight safety investigations related to M61A1 gun jams, Capt Lebovitz liaised directly with operational units in Bagotville to obtain rapid SMM approval for a Local Survey. This survey aimed to inspect the gun scoop disk, which was suspected of being installed backwards-potentially causing the jams. In addition to the guns that jammed in-flight, three other M61A1 guns in Bagotville were identified with incorrectly installed gun scoop disks.

Based on these findings, Capt Lebovitz suspected the issue was not isolated. Consequently, 4 Wing was advised to initiate a Wing-wide Local Survey, which was approved and signed on 7 May 2025. Cold Lake also discovered three reversed gun scoop disks on guns within their area of responsibility.

Thanks to Capt Lebovitz's proactive actions, the fleet was able to identify and correct the issue on six active M61A1 guns. His initiative, technical expertise, and swift coordination exemplify outstanding dedication to operational safety and mission readiness. His approach not only mitigated a potentially serious hazard but also reinforced the importance of thorough airworthiness oversight across the fleet. This commendable effort has significantly contributed to preserving both personnel safety and fleet integrity, reflecting great credit upon himself and the members who acted on these surveys.

We highly commend Capt Lebovitz for his exemplary professionalism and unwavering commitment to excellence.

For Professionalism

For Commendable Performance in Flight Safety

Master Corporal Kristopher Daniel

On 11 September 2025, MCpl Daniel of 436 Sqn, 8 Wing Trenton displayed exceptional professionalism, technical acumen, and dedication to airworthiness standards during the conduct of maintenance on the CC130J Hercules aircraft. The inspection required removal of the entire mid-fuselage Counter Measure Dispenser System (CMDS) panel to facilitate work on two critical tasks. Normally this panel would not have been removed had there been no requirement for modification. In the past, although the screws would have been removed to inspect the CMDS buckets, there would have been no immediate indication the screws were incorrect.

Upon removal of the CMDS panel, on the left side of the aircraft, MCpl Daniel observed that the bolts securing the dispenser buckets to the panel were not seated correctly. Specifically, the bolts failed to protrude through the anchor nuts as required, and instead were recessed, appearing less than flush with the nut surface. Recognizing this as an abnormal condition, he initiated further investigation and went on to check the right-hand side as well. His detailed follow-up revealed that the bolts installed were not the correct size for the mid-fuselage buckets on either side. Rather, the fasteners used were those intended for the tail buckets. In total, 32 bolts securing both the left and right-hand fuselage CMDS panel were determined to be of incorrect length.

MCpl Daniel's determination to pursue a potential deficiency beyond his immediate work scope exemplifies initiative and technical excellence. By identifying a fault that might otherwise have gone unnoticed, he not only ensured compliance with technical standards but also preserved the operational integrity of a critical defensive system.

Through exceptional attention to detail, technical proficiency, and steadfast commitment to safety, MCpl Daniel has brought great credit to himself, his trade, and the Royal Canadian Air Force. His actions made a critical contribution to operational safety and system integrity, exemplifying professionalism and technical excellence. He is a deserving recipient of the *For Professionalism* award.

For Professionalism

For Commendable Performance in Flight Safety

Master Corporal Kenzie Nicholson

On 22 Aug 2024, while conducting bowser refuelling pre-event safety checks for the RCAF 100 Airshow Atlantic at 14 Wing Greenwood, MCpl Nicholson identified multiple fire extinguishers in key operational and public access areas that were expired and in poor overall condition. Although not part of his duties, these extinguisher issues, if left unchecked by qualified firefighters, posed a significant hazard, particularly during an event with heightened risks due to increased personnel traffic, bulk fuel storage, and multiple operational aircraft. Recognizing this hazard and the potential for an incident to occur, MCpl Nicholson took it upon himself to pause the refuelling safety checks and immediately notified fire department personnel of the fire extinguisher issues. Firefighters upon arriving on scene, identified and rectified the extinguisher issues enabling the safety checks to continue. By taking the initiative and notifying the proper personnel of these issues, it created a Unit Flight Safety Stress point. This led to a Fire Department inspection and maintenance initiative to ensure compliance with aviation safety standards while also educating the refuelling team on the importance of adhering to standard safety protocols.

MCpl Nicholson's attention to detail, professionalism and initiative mitigated a potential significant Flight Safety hazard. It is for these reasons that he is most deserving of the *For Professionalism* award.

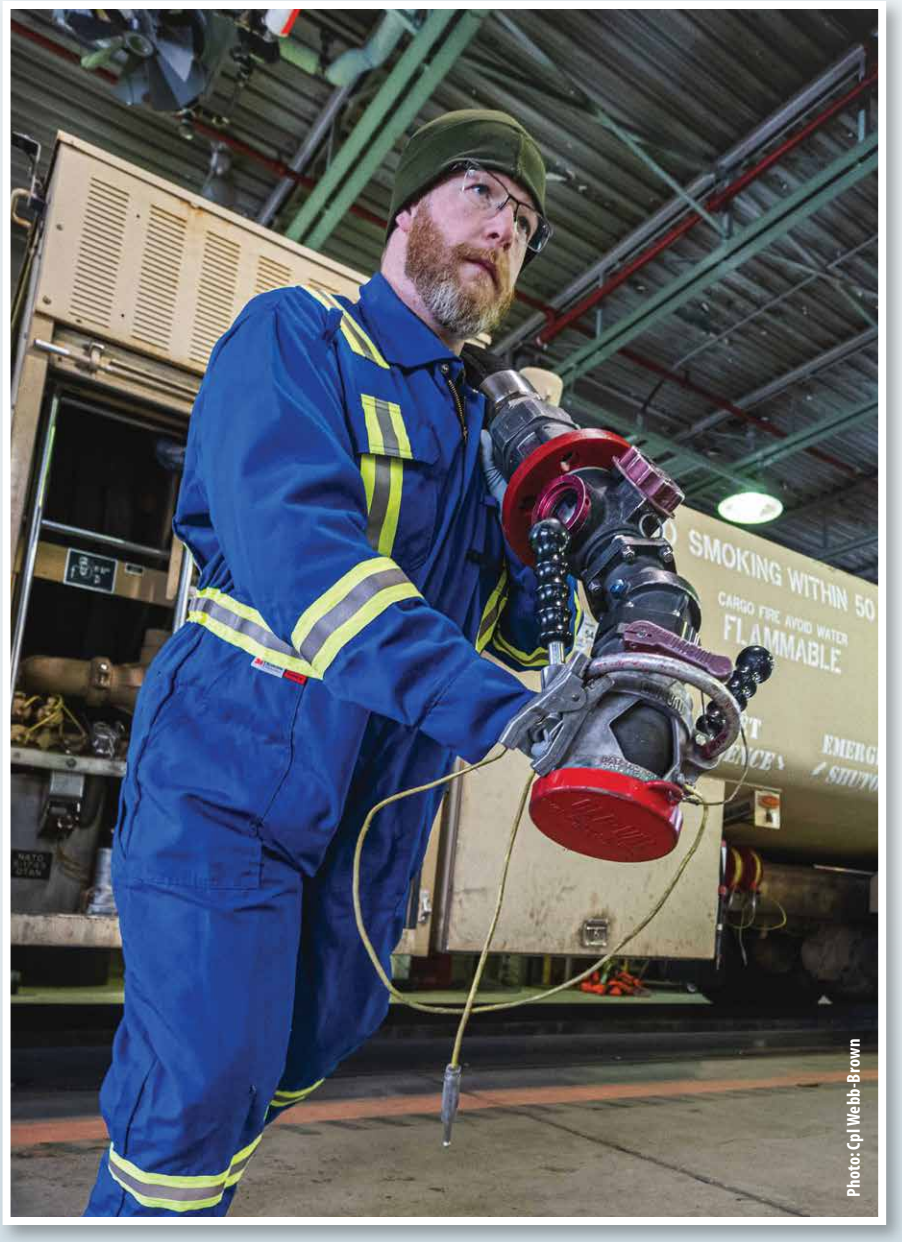

Photo: Cpl Webb-Brown

For Professionalism

For Commendable Performance in Flight Safety

Corporal Delaney Blake

Photo: S1 Gibson

While monitoring operations at 19 Wing Comox as the duty Ground Controller, Corporal (Cpl) Blake observed that a Beechcraft 1900, Pacific Coastal Airlines Flight 1960 at approximately 2.5 NM on final approach, had not lowered its landing gear. Recognizing the potential Flight Safety hazard, Cpl Blake promptly informed the Duty Aerodrome Controller, who relayed the deficiency to the aircraft. The pilot corrected the issue and expressed appreciation for the exceptional air traffic service.

Cpl Blake's keen attention to detail and swift, professional communication directly contributed to averting a potentially hazardous incident. Through vigilant monitoring and high situational awareness, Cpl Blake demonstrated technical competence and reliability that went above and beyond their normal air traffic control duties. This conduct reflects a high standard of professionalism, and they are a deserving recipient of the *For Professionalism* award.

From The Investigator

TYPE: CT139 Jet Ranger (C-FTHL)
LOCATION: Southport, MB
DATE: 26 November 2025

This accident occurred during a training flight with a Royal Canadian Air Force (RCAF) Instructor Pilot (IP) and a Student Pilot (SP). The CT139 Bell 206B Jet Ranger helicopter is used as the primary training platform for Phase III training at 3 Canadian Forces Flying Training School (3 CFFTS).

The training flight departed from the airport ramp south of Hangar 4 and taxied in a 4-foot hover to Pad 1. During the taxi, the IP initiated a Taxi Practice Forced Landing (PFL) which started by rolling the throttle to idle. Upon completion of the simulated engine failure scenario, the throttle was increased to full power, and the SP flew the helicopter to a 4-foot hover. The IP initiated a second simulated emergency, this time a Hover PFL. Once the simulated emergency was secured the throttle was increased and the SP flew the helicopter into a hover (once again) to prepare for the departure. Within 10 seconds of successfully completing the take-off into the hover, a loud explosion was heard from the engine compartment. The helicopter immediately lost power which forced the crew to land on Pad 1. A fire occurred within the helicopter's engine compartment which was subsequently extinguished by personnel from the Southport Fire Brigade.


Photo: MWO Moon

The aircraft sustained serious damage, and there were no injuries.

The investigation is currently focused on technical issues; however, the potential contribution of human factors will continue to be investigated.


Photo: Mr. Keith Kelly

Epilogue

TYPE: CT156 Harvard II (CT156108)
LOCATION: Moose Jaw, SK
DATE: 12 June 2024

The occurrence flight was part the NATO Flying Training in Canada Program for Phase II pilot training in Moose Jaw, Saskatchewan. The crew, consisting of an Instructor Pilot and a Student Pilot, were conducting the first instrument flying lesson of the course syllabus.

After conducting basic instrument flight manoeuvres in the practice area, the aircraft returned to the airfield to conduct practice instrument approaches. While configuring the aircraft for landing on the first approach, the crew was unable to obtain landing gear down and locked indications.

The crew carried out the Landing Gear Malfunction Checklist but were unable to achieve a down and locked condition. In consultation with Maintenance and Operations personnel on the ground, the crew decided to achieve a safe gear up configuration and carry out a gear up landing. The aircraft touched down and remained on the runway as it slid to a stop after approximately 1500 feet. The crew secured the aircraft and egressed normally.

The aircraft sustained D Category damage and there were no injuries.

The investigation determined the cause of the landing gear malfunction to be a faulty Landing Gear Down Valve. A magnified belief in the possibility of a landing gear jam within the CT156 community, as well as the design of the Landing Gear Malfunction Checklist, contributed to the gear up landing. Recommendations include replacement of the solenoid valves, increased training, and improvements to checklist design.

Photo: Cpl Drake

Photo: 15 Wing FS


Conflicting
Airspace
Keep microdrones
in sight and away
from aircraft
Know the rules:
Canada.ca/drone-safety
SÉCURITÉ DES VOLS
FLIGHT SAFETY