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AVIATION SAFETY LETTER

IN THIS ISSUE...

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Canada

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Table of Contents

TIPS AND TOOLS

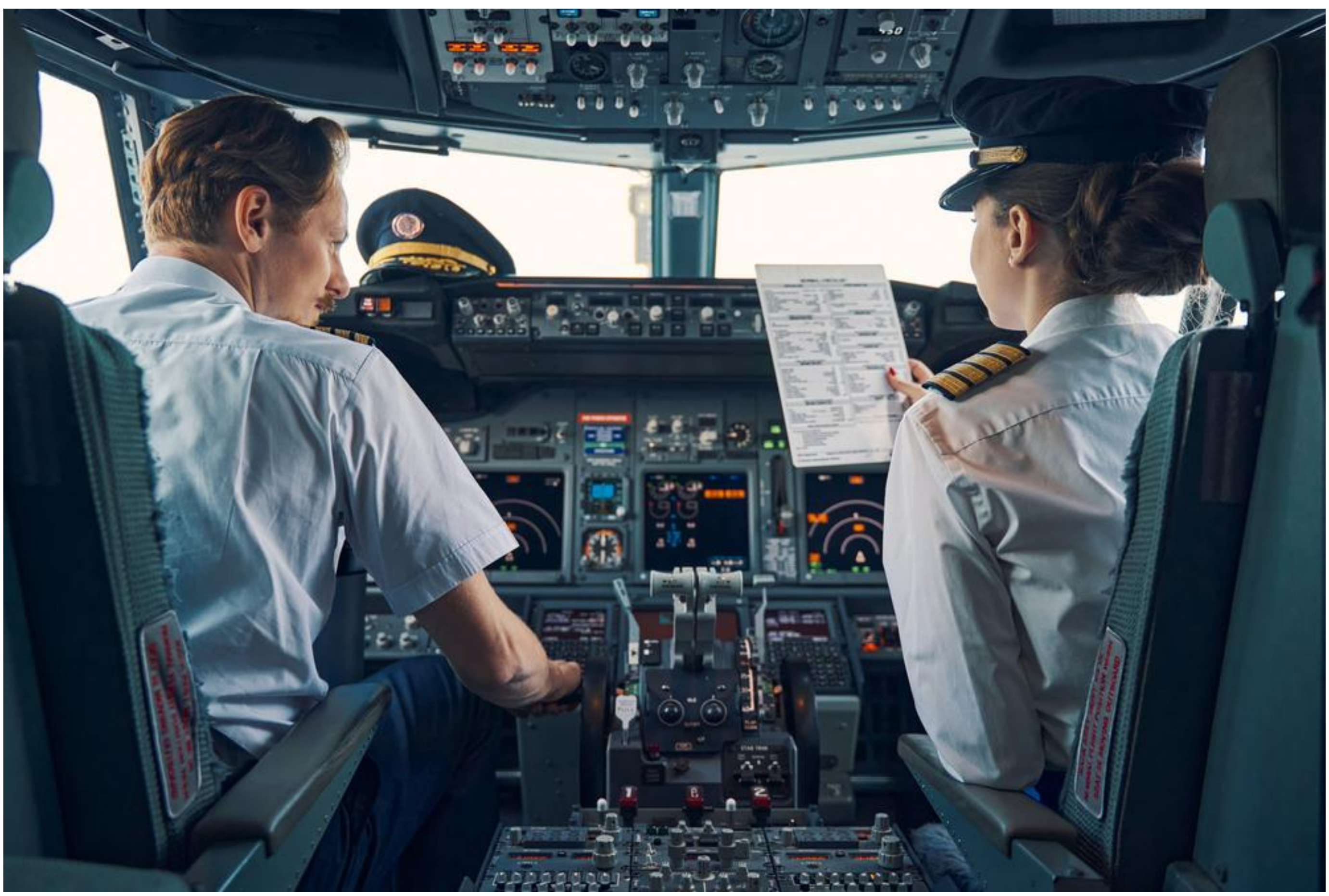
Effective Use of Aircraft Checklists

by David Gagliardi, Civil Aviation Safety Inspector, Flight Operations, Civil Aviation, Transport Canada

Checklists often do not get the respect they deserve. When used well, they significantly contribute to flight safety, but when used poorly, they can actually reduce flight safety.

There are two kinds of checklists applicable to the operation of light aircraft:

1. Do lists: These are written checks where the action is read and then done. For example, on the pre-start checklist “circuit breakers………..checked”
2. Checklists: These are written checks where the actions are first done from memory and then “checked” against the written checklist. For example, on the prelanding checklist “mixture…………rich”



Credit: Shutterstock

As a general rule, "do lists" are used when the aircraft is stopped or in cruise flight. "Checklists" are used when the aircraft is in motion reading, and doing a do list may result in an unacceptable distraction. The prelanding checklist is a good example where the checklist philosophy is usually employed. While the memory actions should still be checked against the written checklist, it is understood that there may be a delay or even that it is not practicable in some circumstances to go heads down, reading the checks, without reducing flight safety. Having a practiced flow will greatly improve the efficacy of these types of checks. By flow I mean you have practiced the physical actions enough that muscle memory helps you get all actions done quickly and completely without having to read each item. Flows should be organized in a consistent pattern, like down to up/left to right or a clockwise circle of the instrument panel.

Effective use of checklists requires checklist discipline. This means accomplishing checks in a deliberate and unhurried fashion without distractions. If you realize you have skipped an item on a check, the best practice is to start over. Finally, you should be sure you understand not only "what" you are checking but also "why." If you have any questions on why a particular check is called for or what exactly you are looking for, talk to an instructor to clear up any confusion.

There are three different types of checklists:

1. Normal checklists: As the name implies, these are used for the usual operations, like the pre-start checklist.
2. Abnormal checklists: These are for issues with the airplane that need attention, but an urgent response is not required and have no memory recall actions. Examples are illumination of the low voltage light or landing with a flat tire.
3. Emergency checklists: These are checklists which are for situations which require immediate actions. They will include actions which must be done from memory and follow-on actions which can be read from the checklist. Memory actions are commonly identified with the text with bold font (note that memory actions are sometimes referred to as "bolded actions"). Therefore, emergency checklists are used initially as a "checklist" with the first, vital actions, completed by memory and then checked on the checklist, followed by the remainder of the checks completed as a do list.

Every pilot should know and have committed to memory all the memory items on every check in the Pilot Operating Handbook (POH) emergency checklist, which, for light aircraft built after 1976, will always be in Section 3 of the POH or in the Aircraft Flight Manual (AFM). Abnormal checklists should never be completed from memory, and the expanded explanatory text in the last part of section 3 should be consulted when time and circumstances permit. In addition, it is worth reviewing the systems descriptions in the POH or in the AFM, as they will often contain information regarding abnormal procedures for some of the systems. For example, in the Cessna 172 POH, the description of the aircraft braking system has valuable information on how to recognize and handle an impending brake failure.

Checklist discipline and effective and efficient use of checklists increase flight safety and are an example of professionalism in a pilot, regardless of their experience level or license held. △

Making it Easy for People to do the Right Thing

Reprinted with permission from Dr. Immanuel Barshi, Senior Principal Investigator in the Human Systems Integration Division at NASA Ames Research Center. He studies the skilled performance of astronauts and pilots, mission controllers and air traffic controllers, their ability to manage challenging situations, and their vulnerability to error. He holds Airline Transport Pilot certificate with A320, A330, B737, and CE500 Type Ratings, and is a certified flight instructor for airplanes and helicopters.

Human performance has always been at the heart of aviation, and understanding human performance is critical. This remains true in the current situation, where demands are quite different for many. But what do we mean by human performance, and how can we best understand it? Immanuel Barshi outlines ICAO's newly published human performance manual.

Figure 1

Regulators are often thought of as only rulemakers and enforcers. The International Civil Aviation Organization (ICAO), as the source of guidance to all civil aviation regulatory bodies, is adding a special perspective recognizing the vital role humans have in all aspects of aviation. The new ICAO *Manual on Human Performance for Regulators* (Doc. 10151) focuses on how regulators can support people in contributing to the aviation system and guides regulators worldwide to make it easy for people to do the right thing.

To develop the manual, ICAO assembled a human performance task force, bringing together a broad range of human performance expertise. Among the multinational experts participating in the task force were regulators in various roles (ranging from aircraft certification to safety oversight and everything in between). There were participants from airlines, air navigation service providers (ANSPs), aviation intergovernmental organizations (including EUROCONTROL) and aircraft manufacturers. And there were human factors researchers and practitioners. The product from these experts is a manual which speaks directly to our new reality.

The new reality of the COVID-19 pandemic makes the focus on human performance all the more critical. The machines around us are not affected by the pandemic other than not being used as much, if at all. It's people who are affected. And it's a minority which is directly affected by the virus and is very sick, while everybody is deeply affected by the new reality of social distancing, lockdowns and tight restrictions on travel and entertainment. Many teleworkers feel that rather than "working from home," they are "living at work." Shining the spotlight on human performance in this new reality is very timely. And although the new ICAO manual is indeed "for regulators," since all of us in aviation are regulated, it is good for us to be familiar with its content. What's more, because we are all human and we all perform, understanding human performance is necessary to make it easy for us to do the right thing.

Human Performance, Systems Thinking and Human-Centred Design

The new ICAO Manual starts off with defining Human Performance (HP) as what people actually do, as the human contribution to system performance. It separates HP from the scientific discipline of Human Factors. From there, it goes on to present some foundational knowledge about the human contribution to system performance, and on to very specific details of how regulators can integrate a HP perspective in all their regulatory activities. Throughout the manual, the focus is on how to make it easy for people to do the right thing and how to support people so they can perform at their best.

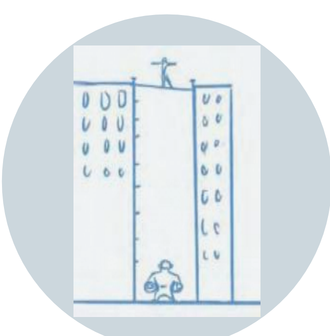
Because HP is about the human contribution to system performance, and because the global aviation system is a complex socio-technical system of systems, the manual lays a foundation of systems thinking (see EUROCONTROL, 2014). It emphasizes the need to understand the complexity of the human, the operational environment and the global aviation system as a whole. Even a minor change in a regulatory requirement in one country, such as a new flight deck procedure, can affect air traffic management (ATM) operations on the other side of the globe, as well as ground operations at airports far from home. And because the airspace and the airports are shared, that one minor change made by the regulator of one country can affect all of us. That is the nature of complex systems: a small change in one part of the system can lead to a large change somewhere else.

It's that proverbial butterfly that flaps its wings in one corner of the world that triggers a thunderstorm on the other side of the world. And regulators must consider such effects every time they think of changing something.

Besides being people themselves, and thus equally subject to human capabilities and limitations, everything regulators do involves people. Even when regulatory requirements specify some technical aspects of equipment, the regulations have to be interpreted and implemented by people.

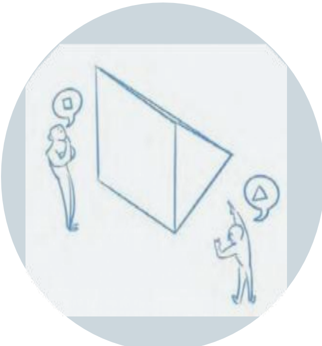
Furthermore, safety in the system is created by people, either through their designs or through their actions. And since the goal of all regulatory activities is to enhance safety, putting people at the center of regulatory considerations is key to safety. Because of that, the new ICAO HP manual introduces human-centered design as a key element in regulatory thinking.

In addition to systems thinking and human-centered design, the new ICAO HP manual introduces five Human Performance principles. These five principles provide ways to understand and thus support human performance and wellbeing. Understanding these principles and implementing that understanding in regulatory activity enables regulators to make it easy for people in the aviation system to do the right thing.



HP Principle 1. People's performance is shaped by their capabilities and limitations

The first Human Performance Principle states that people's performance is shaped by their capabilities and limitations. It discusses both physical and mental capabilities, such as strength and creative thinking, and some of the limitations. Again, there are physical limitations like the need for oxygen, food and sleep, and there are cognitive limitations, such as forgetting. Human-centered design aims to support people's capabilities and compensate for their limitations. Regulatory requirements that are designed in that way can do the same.



HP Principle 2. People interpret situations differently and perform in ways that make sense to them

Reminding regulators that people perform in ways that make sense to them and might interpret situations in different ways is the second HP principle in the ICAO manual. This principle is particularly critical when trying to understand why people act the way they do and is especially important in safety investigations. It is also central to the design of regulatory requirements that may be clear and unambiguous to the regulator who designed them but may not be as clear and obvious to the person who has to implement them.

Because people generally want to do a good job, it's important to remember that if somebody did something different to what the regulator (or the boss) intended, it's often because that different action made sense to them at the time that they did it.

"ADAPTATION IS KEY TO SYSTEM PERFORMANCE, BECAUSE PROCEDURES ARE STATIC, AND WORK IS DYNAMIC"

HP Principle 3. People adapt to meet the demands of a complex and dynamic work environment

While interpreting situations, it is important to recognize that people continuously adapt to meet the demands of a complex and dynamic work environment. This is the third HP principle of the ICAO manual. Adaptation is key to system performance, because procedures are static, and work is dynamic. It is key because task designers cannot foresee all possible situations in which the task may have to be performed (they too are human, and their imagination is also limited; see Principle 1 above). This adaptation forms the basis of the now well known difference between work-as-imagined and work-as-done (see *HindSight* 25).

HP Principle 4. People assess risks and make trade-offs

HindSight 17 focused on safety vs. cost. *HindSight* 29 dealt with goal conflicts and trade-offs. It's as if the Editorial Board of *HindSight* read an early draft of the fourth HP principle, which states that people assess risk and make trade-offs. This statement will come to you as no surprise, but it is an important reminder to us all that what we consider as risky may be different from what somebody else, for instance the regulator or the boss, would consider as risky. For some, the risk of modifying a procedure might be smaller than the risk of being late.

Perhaps the threat of being judged by peers is greater than a disciplinary threat. And we are always faced with conflicting goals and so must negotiate trade-offs. This negotiation is the result of our risk assessment. There is no way around it.

HP Principle 5. People's performance is influenced by working with other people, with technology and with the environment

The fifth HP principle in the ICAO manual deals with the ways in which people's performance is influenced by working with other people, by working with technology, and by working in a particular environment. Regulatory requirements have to be implemented in crews or teams, in working with technology and always in the work environment. Understanding the ways in which these interactions influence human performance is key to establishing and enforcing good regulations that indeed support people in doing their best.

These five HP principles, together with the concepts of systems thinking and human-centered design, form the foundation to integrating human performance considerations in regulatory action. The new ICAO *Manual on Human Performance for Regulators* lays that foundation and then details its implications for a variety of regulatory activities, including: the establishment of regulations and regulatory material; collecting and analyzing data; evaluating and approving equipment, organizations, management systems, procedures and training programs; and providing ongoing surveillance. In so doing, it enables regulators everywhere to make it easy for people to do the right thing. And the manual is relevant to us all, no matter what, part we play in the global aviation system. Especially as we adapt to the new reality, we should keep human performance considerations in mind in everything that we do. △

References

- EUROCONTROL (2014). Systems thinking for safety: Ten principles. A white paper. Brussels: EUROCONTROL Network Manager, August 2014.
- ICAO (2021). Manual on Human Performance (HP) for Regulators. Doc 10151. Montréal: International Civil Aviation Organization.

INSTRUCTOR'S CORNER

Powered Parachute Wing Safety—Best Practices for Owners, Pilots and Students

by Paul Newton, Prairie Power Chute Aviation Ltd.

Introduction

As a certified flight instructor for powered parachutes, I routinely encounter situations that highlight gaps in pilot awareness, equipment inspection and general understanding of the powered parachute wing. Many new owners arrive with used equipment and believe the machine is airworthy simply because the previous owner told them so. Unfortunately, this assumption has repeatedly proven unsafe.

Credit: Shutterstock

Examples include parachutes repaired with steel staples and duct tape, suspension lines tied together after being cut by a propeller, and wings flown well past the point of acceptable porosity. Comments such as "I just need a quick lesson; I've been watching YouTube," are common, yet the condition of the wing alone often makes the aircraft unsuitable for training.

The purpose of this article is to provide clear guidance on the components, inspection considerations and best practices related to the powered parachute wing. Pilots and owners should incorporate this knowledge into both annual and daily inspections.

Fundamentals of the Powered Parachute Wing

A powered parachute wing system consists of four basic components:

1. the parachute,
2. the suspension line system, which includes A, B, C, D and brake lines,
3. the risers, which are nylon webbing straps or steel cables on older models, and
4. stainless steel Maillon oval carabiners connecting suspension lines to risers and risers to the airframe.

Powered Parachute vs. Powered Para-glider

A powered parachute and a powered para-glider are often confused because both use ram-air wings, but they are not the same aircraft. A powered parachute is a three-wheel airframe with foot steering and typically uses Rotax two-stroke or four-stroke engines. It carries significantly more weight and incorporates aircraft-grade avionics such as EIS systems, EFIS displays, ADS-B or transponders.

A powered para-glider is foot-launched or mounted on a lightweight trike. It uses hand brake toggles, different wing construction and different loading assumptions. Even when a para-glider has wheels or two seats, it does not meet the definition or engineering characteristics of a powered parachute.

In North America, Powrachute is currently the only active manufacturer producing certified special light sport aircraft (SLSA) powered parachutes. While SLSA certification is not recognized in Canada, the aircrafts are still built to those standards.

Wing construction, materials, inspection methods and repair procedures differ significantly between powered parachute and powered para-glider equipment, and facilities that service one may not be qualified to service the other. A notable example comes from a para-glider repair facility that specifically states that "it does not repair powered parachute wings" and recommends sending powered parachute wings to skydiving riggers instead. This recommendation is incorrect for powered parachute wings because skydiving canopies use Dacron lines that stretch to absorb shock, while powered parachute suspension lines are non-stretching and constructed for entirely different load characteristics. The takeaway is simple: not all parachutes are alike and cannot be inspected or repaired interchangeably.

Section 1

The Powered Parachute Wing

Powered parachute wings today are primarily produced by Apco in Israel, Performance Designs is in the United States, and Manta is in Israel. Older models included the ASAP Mustang. Powered parachute wings are generally 500 to 550 square feet and use rectangular or slightly rounded-corner profiles. They are not elliptical para-gliding wings.

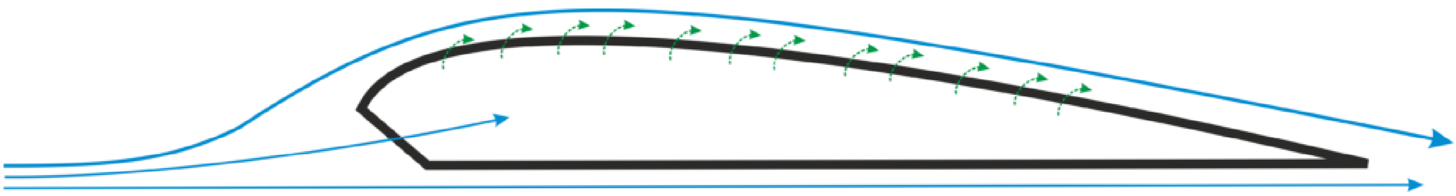
Every wing has a placard sewn onto it, listing the model, size, serial number, manufacturing date and maximum certified takeoff weight. This information must always be examined before flight or purchase. In addition, the aircraft's operating manual lists the original equipment wing specifications and the maximum takeoff weight. The aircraft is bound by whichever limitation is most restrictive.

Wing changes by previous owners must be treated with caution. Installing a smaller wing, a para-gliding wing or an elliptical wing can reduce weight carrying ability, increase takeoff and landing speeds, reduce stability, and, in many cases, make the aircraft unsafe to fly.

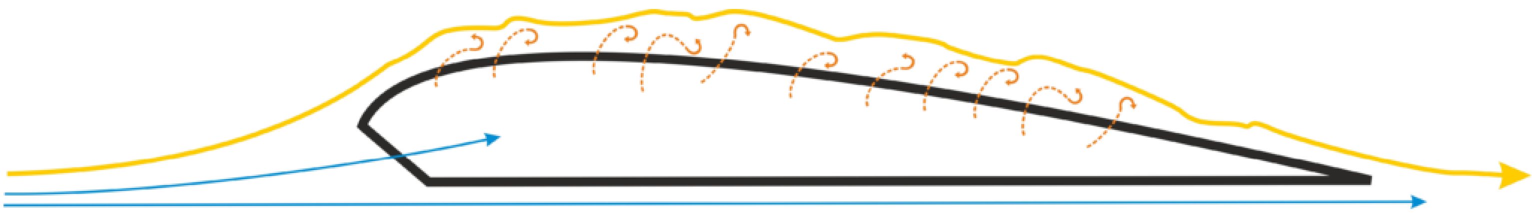
Wing Material and Porosity

Most powered parachute wings are constructed from zero-porosity ripstop nylon coated with polyurethane and then siliconized. The fabric is designed to prevent air passing through it, which is essential to maintain lift and preserve designed flight characteristics.

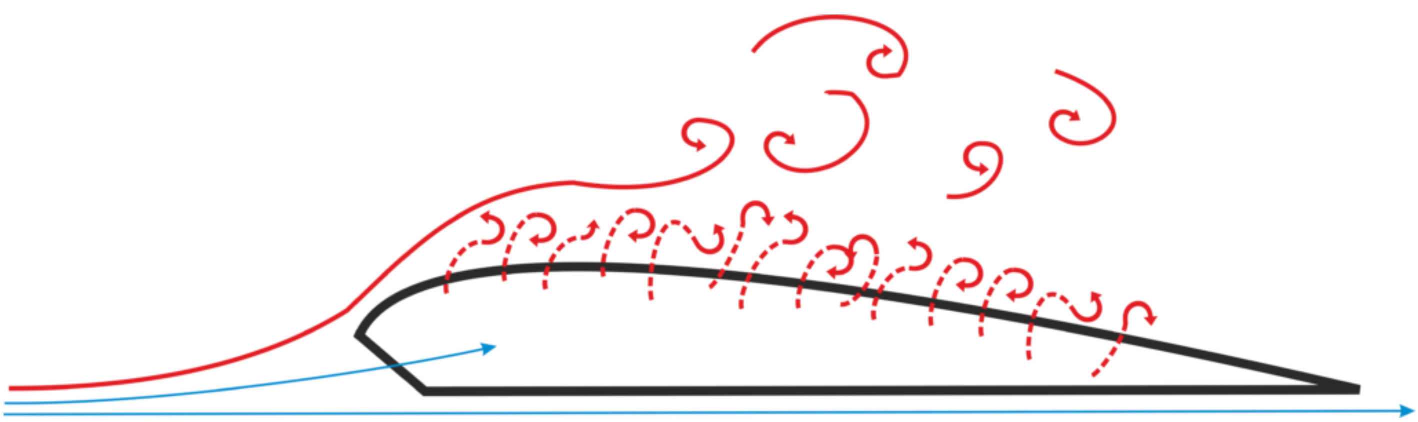
Porosity decreases over time due to UV exposure, airborne salt, dust, aerosols, moisture and age. Multi-colour wings experience uneven degradation because UV affects each dye differently. Each colour cell must be tested independently using a porosimeter, such as the Hello Porozit N2 or the MK2. These instruments measure the time required for a quarter liter of air to pass through a defined fabric area at a set pressure.



No porosity



Increased porosity



Critical porosity

Porosity expectations

A new wing usually tests above 2,000 seconds, with many Apco wings exceeding 3,000 seconds when brand new. As porosity readings drop below 700 seconds, performance starts to decline. At that point the wing is no longer viewed as zero porosity, and the likelihood of noticeable performance loss grows as the numbers continue downward. One current manufacturer advises removing a chute from service once porosity reaches 150 to 200 seconds, while also noting that acceptable standards can vary from country to country. In normal use, most wings that are properly cared for will deliver an average service life of about 400 to 600 flight hours before porosity and overall fabric condition become limiting factors. The colour of the fabric and its exposure to sunlight also have a real impact. Darker colours tend to absorb more radiant heat, and ultraviolet exposure accelerates fabric breakdown especially on bright colours. This can shorten the usable life of the wing and lead to faster porosity loss.

Best Practice

Any wing older than roughly five years should be tested for porosity annually. Many manufacturers recommend reinspection every 2 years or 100 hours. If the wing shows visible fading, water staining, mold, tears, cut areas or suspension line damage, it must be professionally inspected.

Pilots must include wing inspection in their daily preflight checks. No wing should be stored wet, in sunlight or near corrosive aerosols. Dragging the wing on gravel or rough surfaces removes the silicone coating and permanently increases porosity.

Section 2

Suspension Lines

Suspension lines are precisely manufactured to exact lengths and materials for each position on the wing. Line length varies from the center outward and from the leading to trailing edge. Even small changes in length affect pitch, roll and stability.

Lines connect to reinforced fabric tabs on the wing and are secured to the risers with stainless steel Maillon carabiners. Many powered parachute suspension lines carry individual loads exceeding 500 pounds.

Line types include sheathed and unsheathed variants. They are manufactured from materials such as aramid, Technora, Kevlar, polyester and Dyneema. These materials have different shrink rates, UV resistance, heat tolerance and life expectancy. Some lines shrink; others do not. Some require replacement at 200 hours; others can last longer with proper care.

Key Considerations

Aramid lines degrade quickly under UV exposure. Dyneema is strong but melts at relatively low temperatures. Salt contamination can reduce line strength by up to seventy percent. Lines with knots, cuts or fraying must be replaced immediately. Substituting hardware store cord or generic line is unsafe.

Summary

During annual inspection, each line must be examined individually for length changes, fiber damage, discoloration and symmetry. If the original manufacturer no longer exists, a certified parachute rigger can fabricate exact replacements. A, B, C and D lines differ in material, length, and load capacity and cannot be interchanged.

Section 3

Risers

Risers are webbing straps or cables designed to carry the load from the suspension lines to the airframe. They must be checked for cuts, abrasion or fiber damage. Risers also play a critical role in center-of-gravity tuning.

The correct riser attachment points depend on pilot weight, and many powered parachutes use multiple mounting positions to achieve proper balance. The aircraft should hang level with the front wheel slightly elevated when suspended. Incorrect riser placement can affect takeoff behaviour, flight stability and landing characteristics.

Riser length is also tied to engine torque. Rotax 582 engines rotate clockwise, while Rotax 912 engines rotate counterclockwise. Riser length must be matched to engine rotation to counteract torque-induced roll tendencies.

Section 4

Carabiners

Maillon stainless steel oval quick links are the only approved hardware for attaching lines to risers and risers to the frame. They must be inspected for thread security and wear marks. Hardware store carabiners are visually similar but lack the material strength, certification and manufacturing standards required for aircraft use. They must never be substituted.

Conclusion

Safe operation of a powered parachute depends heavily on the condition of the wing, suspension system, risers and carabiners. Pilots must understand that used equipment often carries hidden risks, and visual inspection alone is rarely enough. Porosity testing, line evaluation, proper riser placement and the use of certified hardware are all essential to maintaining the aircraft's designed performance and safety margins.

Every owner and pilot should adopt a structured wing inspection process as part of both preflight and annual checks, supported by documented results. When in doubt, seek evaluation from qualified powered parachute inspection professionals. The wing is the single most important component on the aircraft, and its condition determines not only performance but survivability. △

Submission of Instructor's Corner Articles

The purpose of the *Aviation Safety Letter* instructor's corner is for instructors to share past instructing/teaching experience with the ASL readership.

Submitted articles can be addressed to a variety of readers, instructors, student pilots, private pilots, and glider, ultralight or commercial pilots. In fact, the article is for any type of student that an instructor may encounter in the course of their career, whether it be for a licence or a rating. The most important thing is that, at the end of the article, a lesson has been learned.

If you would like to submit an article or would like more information, please send an email to the following address: TC.ASL-SAN.TC@tc.gc.ca △

Happy Retirement to our ASL Editor

After nearly a decade at the helm of the *Aviation Safety Letter* (ASL), our editor, Jim Mulligan, is taking his well-earned retirement. Since publishing his first issue in 2016, he has guided the publication with steady leadership, insight, and an unwavering commitment to advancing aviation safety. The ASL continued to inform, educate, and connect Canada's aviation community with timely and practical content. We thank him for his years of service and wish him the best in this next chapter!

Sean Finnerty will take over as the ASL editor. His career in aviation spans over 25 years starting off in school for aircraft maintenance, then switching over to aviation management program with pilot training. For the past 11 years, he has worked at Transport Canada in the Prairie and Northern, and the national capital regions in Calgary primarily as a Cabin Safety/AOSH inspector, regional manager for transportation security at the Calgary international airport, and most recently as the Transport Canada Aeronautical Information Manual (TC AIM) coordinator. △

The 2025 DCAM Flight Instructor Safety Award

by Jane Abramson, co-founder and national administrator, janeabramson@videotron.ca

The 2025 DCAM presentation at ATAC'S Aviation Conference L to R. Adam Wright, presenting the trophy, Daniel Gillett, recipient, Wayne Gouveia, Senior VP ATAC Credit: Daniel Gustin

The prestigious 2025 David Charles Abramson Memorial (DCAM) flight instructor safety award was presented to Mr. Daniel Gillett by Mr. Adam Wright at Air Transport Association of Canada's annual Canadian aviation conference & tradeshow on November 19 at the Fairmont Queen Elizabeth hotel in Montréal.

Daniel Gillett, assistant chief flight instructor, licensing standards manager, pilot examiner, and King C90 captain, pursued his passion for flight at MFCtraining (formerly Moncton flight college) after earning his bachelor's degree from the university of New Brunswick.

His professionalism, instructional excellence, commitment to safety and mentorship has had a lasting impact on the quality of instruction and student success at MFCtraining. He is a life-long learner. He embodies the values this award represents.

In his acceptance speech, he states, "the award highlights the critical role flight instructors play in aviation safety, both in Canada and globally. Safety begins from the ground up, and the industry depends on experienced instructors and mentors to guide students and junior pilots who then carry what they learned from their instructor throughout their flying journeys."

An honourable mention was given to Kyla Ewasuik, chair and chief flight instructor at Alberta College of Aeronautics (ACA) for her significant contributions to advancing Canadian aviation safety.

To preserve the historical record of the award, the recipient's name is engraved on the trophy and entered in the official logbook, both of which are on permanent display at the Canada aviation and space museum in Ottawa. Thanks was given to the museum for their custodianship of the trophy.

Acknowledgement was given to the DCAM sponsors, Air Transport Association of Canada, Wings & Helicopters magazine, Seneca college school of aviation, and Lost Aviator Coffee Co.

Nominations can be made at any time throughout the year up to September 14. △

"OUR MISSION: RAISING THE PROFILE OF FLIGHT INSTRUCTORS BY RECOGNIZING AND HONOURING EXCEPTIONAL INSTRUCTORS IN CANADA WHO HAVE MADE A SIGNIFICANT CONTRIBUTION TO THE ADVANCEMENT OF CANADIAN AVIATION SAFETY AND WHO POSSESS SUPERIOR TEACHING SKILLS."

ON THE RADAR

SMS Modernization Initiative

by Andrew Christmas, Civil Aviation Inspector, Technical Program & Evaluation, Civil Aviation, Transport Canada

Credit: Shutterstock

Back in 2005, Canada became a pioneer in safety management systems (SMS) for aviation when Transport Canada (TC) introduced SMS regulations for airlines and the approved maintenance organizations that service their aircraft. As the safety culture in both the aviation industry and within TC began to mature and adopt safety management principles into day-to-day safety activities, TC began introducing SMS for other sectors like airports, air navigation and private air operators.

A new generation of professional aviators has emerged in Canada over the past two decades. Pilots, aircraft maintenance engineers (AMEs) and air traffic controllers now have an opportunity to be a part of aviation enterprises, where a positive safety culture is encouraged and reporting a genuine error results in a safety report, not discipline for the individual.

The international community has also recognized the potential safety benefits of SMS and, in 2013, the International Civil Aviation Organization (ICAO) published *Annex 19*, a document outlining standards and recommended practices for safety management, to the *Chicago Convention*.

In the safety management document, ICAO simplified the SMS framework into four components. These components include:

- safety policy and objectives: establishing safety policies and objectives;
- safety risk management: identifying hazards, assessing risks and implementing mitigation measures;
- safety assurance: monitoring and measuring safety activities; and
- safety promotion: promoting a positive safety culture through training and communication.

Now, 20 years after introducing SMS to Canada's aviation industry, TC has begun a process of regulatory modernization that will bring more sectors into the SMS framework and harmonize Canadian regulations with our international partners. International alignment will make global compliance and recognition easier for Canadian companies and private air operators.

Updating Canada's SMS framework for aviation is a big task, so TC has divided the modernization initiative into two distinct packages. Package 1, currently in development, will harmonize existing SMS requirements and consolidate them under Subpart 107, align the language and structure with *Annex 19* to the *Chicago Convention*, and expand application of the SMS framework to certain design and manufacturing organizations.

More details on Package 1 can be found on our Web site.

Package 2 of the SMS modernization initiative will begin with a safety risk assessment and will explore the possibility of extending SMS requirements to other sectors under the *Canadian Aviation Regulations* (*CAR*s). More details about SMS modernization Package 2 will be shared as the risk assessment progresses.

To stay up to date on SMS modernization, you can register for the Canadian Aviation Regulation Advisory Council by completing a subscription form.

As individuals with a passion for aviation, the safety professionals at TC are extremely proud of the progress Canadian airlines, approved maintenance organization (AMOs), airport authorities, air navigation service providers and private air operators have made in the field of SMS. We are honoured to have learned from you through our safety engagement over the past two decades, and we look forward to continuing to work with you to develop an environment where the next generation of aviation experts will thrive and continue to move Canada's safety culture forward. △

Submission of *Aviation Safety Letter* (ASL) articles

Do you have an aviation safety topic you are passionate about? Do you want to share your expert knowledge with others? If so, we would love to hear from you!

General information and guidance

The ASL's primary objective is to promote aviation safety. It includes articles that address aviation safety from all perspectives, such as safety insight derived from accidents and incidents, as well as safety information tailored to the needs of all holders of a valid Canadian pilot licence or permit, to all holders of a valid Canadian aircraft maintenance engineer (AME) licence and to other interested individuals within the aviation community.

If you are interested in writing an article, please send it by e-mail to TC.ASL-SAN.TC@tc.gc.ca in your preferred language. Please note that all articles will be edited and translated by the Transport Canada Civil Aviation (TCCA) Aviation Terminology Standardization Division and will be coordinated by the ASL team.

Photos

In order to captivate our readers' interest, we recommend that you include one or two photos (i.e., photo, illustration, chart or graphic) for each article, if possible. Please send us your photos as an e-mail attachment (preferably as a jpeg).

We look forward to receiving your articles. △

Civil Aviation Documents Published Recently

Civil Aviation Safety Alerts (CASAs)

Document number (R-Revised)	Issue number (Date issued)	Subject
CASA 2025-14	Issue 01 2025-12-24	Potential Risk of Interference of 5G Signals on Radio Altimeter—Update on the 5G Spectrum Environment in Canada
CASA 2025-13	Issue 01 2025-12-22	ATA 79–A220 PW1500G Oil System Inspection after OIL DEBRIS MONITORING (ODM) Indication

Advisory Circulars (ACs)

Document number (R-Revised)	Issue number (Date issued)	Subject
AC 507-002	Issue 02 2026-02-06	Certificate of Airworthiness
AC 700-001	Issue 07 2026-01-28	Dangerous Goods Specific Approval
AC 573-002	Issue 04 2025-12-31	Aircraft Certification Authority Based on Foreign Qualifications
AC 302-015	Issue 02 2025-12-19	Runway End Safety Area Bearing Strength
AC 601-005	Issue 02 2025-12-19	Meteorological Tower (MET) Notification

RECENTLY RELEASED TSB REPORTS

TSB Report A23P0130—Loss of Control and Collision with Terrain

History of the flight

On October 6, 2023, a Piper Aircraft Corp. PA-34-200 (Seneca) aircraft departed CYNJ with an instructor and two students on board for their second training session toward a multi-engine rating. One student was seated in the front-left seat, and the other student was seated in the second row of seats. Approximately one hour later, once the training session was complete, the aircraft returned to CYNJ. Upon shutdown, the students switched seating positions. The aircraft then departed CYNJ to conduct additional training, including single-engine exercises. The air training exercises were conducted north of CYCW. The aircraft subsequently proceeded to CYCW. The investigation was unable to determine what the instructor's intentions were once they arrived at the airport; however, the aircraft was observed completing one circuit and then lining up for an approach to Runway 07.

The aircraft levelled off below 100 ft above ground level (AGL) while aligned with the runway; then, before reaching the runway threshold, it banked and turned right. The bank angle continued to increase past 90° while the aircraft's heading changed toward a southerly direction, and the pitch decreased toward a nose-down attitude. At 1359, the aircraft impacted the ground near a casino in a close-to-inverted and nose-low attitude.

There was no flight-path data available from the aircraft's avionics, and there was no radar information recorded of the aircraft's activity at CYCW. However, a dashcam video camera from a vehicle passing the airport recorded the last moments of the flight.

The impact resulted in damage to trees and vegetation. An unknown quantity of fuel was released. There was no post-impact fire. The aircraft's emergency locator transmitter activated in response to impact forces. All three occupants were fatally injured.

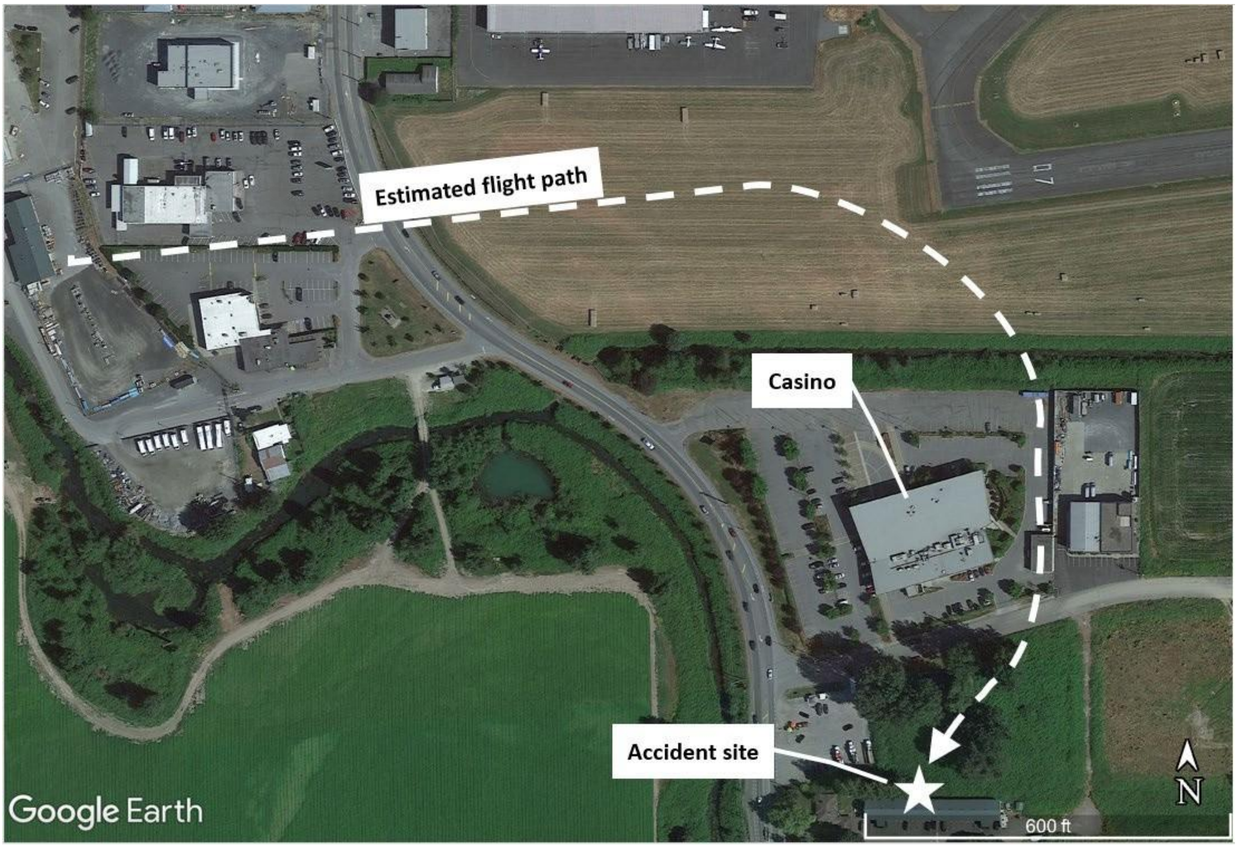


Figure 1: The aircraft's estimated flight path based on dashcam video (Source: Google Earth, with TSB annotations)

Aircraft information

The Piper Aircraft Corp. PA-34-200 (Seneca) is a twin-engine, light aircraft designed for general aviation purposes, including flight training, personal use and commercial applications. It features a low-wing configuration with one engine on each wing and is equipped with tricycle landing gear.

Post-accident examination

The aircraft was examined at the accident site. The wing flaps were in the UP position, and the landing gear was extended. Because of the nature of the impact, damage to the aircraft and work by first responders, the investigation was unable to assess the position of the engine controls or ancillary controls at the time of the occurrence. Damage to the left engine and propeller were consistent with power being produced at the time of impact. Damage to the right propeller was consistent with the engine producing low or no power; the propeller was in an unfeathered position at impact. At the accident site, first responders noted a strong odour of fuel and saw leaking fuel, suggesting there was fuel in the aircraft at the time of impact. First responders moved both fuel selectors to the OFF position while attending the scene.

All aircraft components were accounted for at the accident site, and flight control continuity was verified.

After the wreckage was recovered, a more detailed examination of the airframe, flight controls and engines was completed. Particular attention was given to the right engine and propeller. The engine was disassembled and inspected, and all major components were visually inspected. The fuel delivery system and ignition system were tested by a third party using diagnostic equipment; no anomalies were noted.

The light bulb for the stall warning system and the light bulbs for the turbocharger system were sent to the TSB Engineering Laboratory in Ottawa, Ontario for analysis. It was determined that the stall and left-hand overboost lights were likely off at the time of the impact, but the right-hand overboost bulb exhibited some deformation that indicates that the bulb could have been illuminated at the time of impact. The investigation could not reconcile this observation given that the turbochargers' waste gates were fully open and not providing additive boost to the intake manifold.

Notwithstanding the extent of the damage, the investigation did not discover any issues with the flight controls that would have led to the loss of control or anything mechanical that would have prevented either engine from producing power.

Weather information

The aerodrome routine meteorological report issued at 1400 for CYXX, the closest airport to the accident site with weather reporting, located 18 nautical miles to the northwest, indicated the following:

- winds from 340° true (T), variable from 320° T to 050°T, at 4 kt
- visibility of 30 statute miles
- few clouds at 23 000 ft AGL
- temperature 24°C and dew point 12°C
- altimeter setting 30.15 in of mercury
- density altitude 1 100 ft above sea level

Weather was not considered a factor in the accident.

Minimum control speed roll

The dashcam video and post-accident wreckage examination are consistent with the aircraft entering a minimum control speed (V_{MC}) roll before the collision with terrain. A V_{MC} roll occurs when there is an asymmetrical power situation, and the aircraft's speed falls below V_{MC}. In this scenario, the aircraft will begin to yaw and roll toward the low-thrust-producing engine because there is insufficient yaw control available to counter the thrust produced by the operating engine.

To avoid a V_{MC} roll, pilots are trained to keep the aircraft's speed above V_{MC} when in an asymmetric thrust situation. If control becomes difficult, a reduction in power on the higher- thrust-producing engine is required to regain yaw and roll control.

The pilot's operating manual (POM) for the PA-34-200 states the following with respect to V_{MC}:

> V_{MC} is the calibrated airspeed below which a twin-engine aircraft cannot be controlled in flight with one engine operating at take-off power at sea level density altitude and the other engine windmilling. V_{MC} for the Seneca has been determined to be 80 MPH. Under no circumstances should an attempt be made to fly below this V_{MC} with only one engine operating. As a safety precaution, when operating under single-engine flight conditions either in training or in emergency situations, maintain an indicated airspeed above 90 MPH.

The POM goes on to state that any demonstrations that approach an uncontrolled flight condition should be made at a minimum of 3 500 ft above the ground.

The POM provides the following procedure for maintaining or regaining control of the airplane in the case of an engine failure in a climb:

> If engine failure occurs when airspeed is below 80 mph (CAS) [calibrated airspeed] reduce the power on the good engine as required to maintain directional control. Reduce nose attitude to accelerate toward the single engine best rate of climb speed of 105 mph. Then feather the inoperative engine […]

Multi-engine training

To qualify for a multi-engine rating in Canada, a candidate must meet the requirements established by Transport Canada in *Canadian Aviation Regulations* (CARs) Standard 421. These requirements include holding a valid pilot licence and demonstrating proficiency in operating multi-engine aircraft. The training process developed by the occurrence flight training unit is largely based on Transport Canada's TP 11575E, *Instructor Guide: Multi-engine Class Rating*, which does not provide a specific mandated training syllabus for the multi-engine rating; it provides only guidance for flight training units and instructors.

The training guidance focuses on developing the necessary skills to safely manage multi-engine operations, such as handling asymmetric thrust, engine-out procedures and emergency scenarios. The guidance includes the recommendations to avoid simulating an engine failure on approach below 500 ft AGL, avoid operating at airspeeds below the airplane's best rate-of-climb airspeed with a single engine, and only practice this exercise on actual approaches after the student is competent in handling the emergency at altitude.

The CARs do not mandate a minimum number of training hours; instead, candidates must achieve the required competencies through flight instruction and preparation for the associated flight test.

The investigation could not determine the specific exercise or intent of what was occurring during the missed approach at CYCW.

Safety messages

Instructors are reminded that during multi-engine training, any asymmetric thrust exercises should be performed at a safe altitude and airspeed, given the significant altitude losses that can occur in the event of a V_{MC} roll.

Pilots of multi-engine aircraft are reminded that should a loss of yaw control occur during an asymmetric thrust situation, it is imperative that power be reduced on the operating engine, and recovery of airspeed be attained by reducing the pitch attitude. At lower altitudes, this may result in a forced landing, which offers greater survivability than a V_{MC} roll.