Transportation Safety Board of Canada
Bureau de la sécurité des transports du Canada

AIR TRANSPORTATION SAFETY INVESTIGATION REPORT A24P0107

LOSS OF CONTROL AND COLLISION WITH WATER

Wilderness Seaplanes Ltd.
Cessna A185F, C-GBTJ
Port Hardy Water Aerodrome (CAW5), British Columbia, 25 NM NNE
02 October 2024

History of the flight

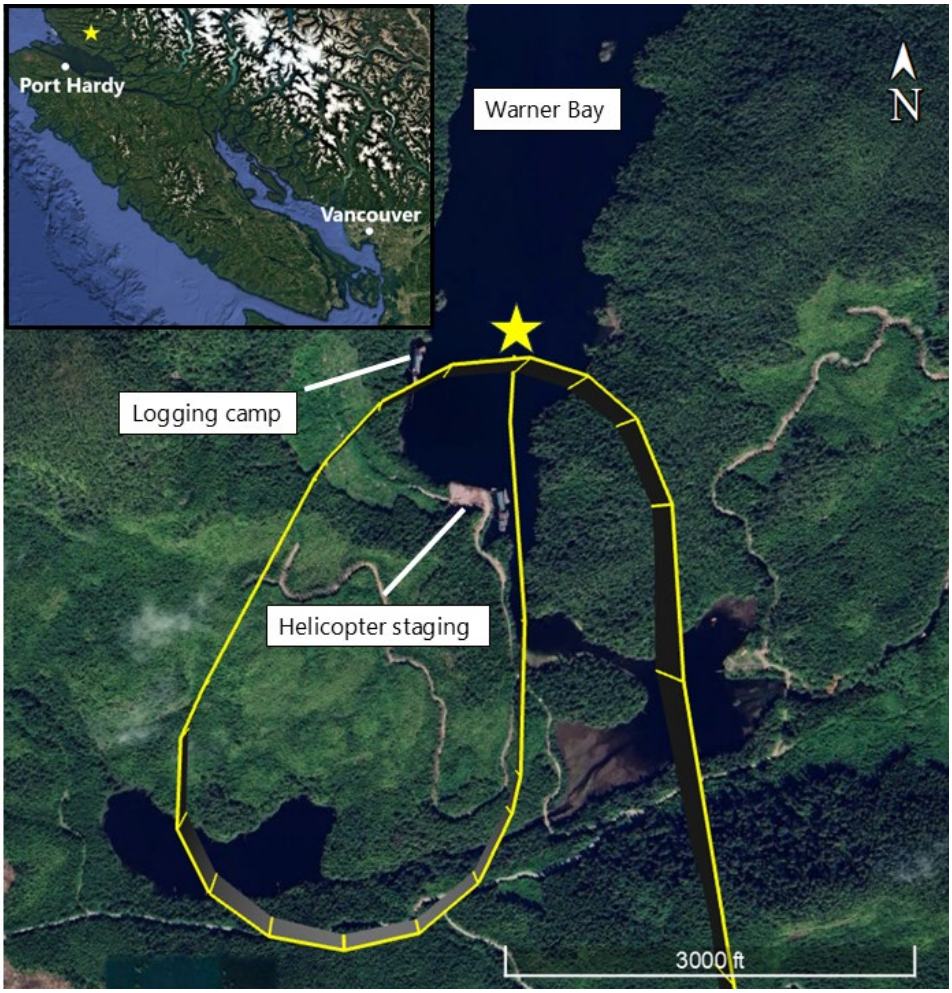
On 02 October 2024, the float-equipped Cessna A185F aircraft (registration C-GBTJ, serial number 18503950) departed Port Hardy Water Aerodrome (CAW5), British Columbia (BC), at approximately 1543[1] on a visual flight rules (VFR) flight to a logging camp located on the west side of Warner Bay, BC, with the pilot, 2 passengers, and 215 pounds of cargo on board. The passengers were part of a helicopter crew based at the camp and were being transported to the site to begin their work rotation.

The pilot was seated in the front left seat, with 1 passenger in the front right seat, and the other passenger in the rear right folding seat. The left rear folding seat was stowed and some cargo was placed in this space. Other cargo was placed in the baggage area.

[1] All times are Pacific Daylight Time (Coordinated Universal Time minus 7 hours).

The occurrence flight was the pilot's 2nd flight of the day to Warner Bay, and the same north-northeast route across Johnstone Strait toward the mainland was flown on both flights. While crossing the strait, the pilot noted a northwest wind that had a direction similar to the wind during the 1st flight but with less speed. As a result, the pilot flew to the southern end of Warner Bay to conduct a landing approach in a northbound direction, similar to the 1st flight (Figure 1).

Figure 1. The approximate location of the occurrence (inset) and the approach path of the occurrence aircraft into Warner Bay with the point of impact indicated with a star) (Source: Google Earth, with TSB annotations)



The aircraft approached the bay over terrain on the southeast side at approximately 1000 feet above sea level (ASL). The pilot initiated a left turn and crossed over the bay to assess the water surface for wind speed and objects in the landing area. The aircraft continued southbound before completing a left turn and setting up for final approach on a northbound heading.

At approximately 1601, the aircraft was 1000 feet south of the bay and on approach at 198 feet ASL with a ground speed of 84 knots and a vertical descent rate of 1194 fpm. Fifteen seconds later and just before touchdown, the aircraft was at 24 feet ASL and the ground speed and descent rate had both slowed to 75 knots and 307 fpm, respectively. At that time, the water surface in the vicinity of the landing site had areas of both glassy water and rippled water.

When the aircraft landed, a float dug in, and the aircraft immediately veered to the right. The left wing then contacted the water and the aircraft overturned. The aircraft cabin rapidly filled with water and the aircraft settled upside down with only the keels of both floats above the surface.

Rescue coordination

An eyewitness at the logging camp called 911, which activated the search-and-rescue (SAR) response. At approximately the same time, 2 camp members departed the dock in a small aluminum boat to assist.

The rear passenger was the first to egress, exiting through the left door. The passenger surfaced briefly and then put his head back underwater in an attempt to find the other occupants. The passenger felt the pilot's hand and pulled the pilot out of the same door. They both surfaced at the same time as the boat arrived.

The front right passenger attempted to egress through the same door, but his left leg was trapped in the cabin. The rear passenger swam down several times and tried to free the leg while the pilot and camp members pulled up on the front passenger's arms. The occurrence aircraft continued to sink, and rescuers were only able to keep the front passenger's head above water temporarily.

At approximately 1645, a larger camp vessel arrived on the scene and towed the aircraft toward the dock.

At approximately the same time, a Royal Canadian Air Force Cormorant SAR helicopter arrived at the scene. Three SAR technicians (SAR Techs) dispatched from the Cormorant and swam to the dock. Following several dives, the SAR Techs identified that a safety belt was under tension in the vicinity of the trapped passenger's foot and worked to release the foot and recover the passenger's body from the aircraft. The passenger had been in the water for approximately 75 minutes and had drowned.

The aircraft was substantially damaged, and no signal from the submerged emergency locator transmitter (ELT) was received by the Canadian Mission Control Centre.

Pilot information

General

The occurrence pilot held an airline transport pilot licence – aeroplane and was rated for the flight in accordance with regulations. The pilot had a valid Category 1 medical certificate and had accumulated 20 200 total flight hours, of which 15 500 flight hours were on float-equipped aircraft. The pilot had flown 2000 hours on Cessna 185 float-equipped aircraft.

The pilot joined Wilderness Seaplanes Ltd. in April 2024 and had completed a pilot competency check on the occurrence aircraft on 14 June 2024.

Underwater egress training

The *Canadian Aviation Regulations* (CARs) require "initial training followed by training every three years on underwater egress for seaplane pilots".[2] Although there are no current standards for underwater egress training programs, Transport Canada (TC) guidance states that effective egress training for pilots must include both a ground school component and a water component at each recurring interval.[3]

Records indicate that the pilot had completed the ground school component of egress training on 11 February 2022. At that time, many COVID-19 restrictions were in place, which may have limited the availability of in-water training. The investigation could not determine when the pilot had last completed the water component. Records also indicate that the pilot had completed practical training for emergency exits with a previous employer on 04 July 2023 and with Wilderness Seaplanes Ltd. on the occurrence aircraft on 01 May 2024.

Aircraft information

The occurrence Cessna A185F aircraft was manufactured in 1979 and equipped with a Continental IO-520D reciprocating engine. The aircraft was maintained under a TC-approved maintenance schedule. There were no recorded defects outstanding at the time of the occurrence.

The aircraft was equipped with folding seats that were installed in accordance with a TC-approved Supplemental Type Certificate (STC).[4] The aft folding seats can be stowed against the fuselage to allow for more cargo space.

Weather information

The nearest aviation weather reporting station to the occurrence site was Port Hardy Aerodrome (CYZT), BC, which is located 24 nautical miles (NM) south-southwest of the occurrence site. The aerodrome routine meteorological report (METAR) for CYZT issued at 1600 and valid at the time of the occurrence indicated the following:

- Winds from 350° true (T), variable in direction from 310°T to 20°T at 6 knots
- Visibility of 12 statute miles (SM) in light rain showers
- A broken ceiling at 2000 feet above ground level (AGL), a broken cloud layer at 5700 feet AGL, and an overcast cloud layer at 7500 feet AGL
- Temperature 12 °C and dew point 10 °C
- Altimeter setting 30.31 inches of mercury (inHg)

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[2] Transport Canada, SOR/96-433, *Canadian Aviation Regulations*, paragraphs 703.98(2)(c.1) and 704.115(2)(a.1).

[3] Transport Canada, Advisory Circular (AC) 700-056: Pilot Egress Training (Seaplane), Issue 02 (13 May 2022), Section 5.0: Course content – General, at https://tc.canada.ca/en/aviation/reference-centre/advisory-circulars/advisory-circular-ac-no-700-056 (last accessed 13 March 2026.)

[4] A Supplemental Type Certificate (STC) is issued for major design changes to type-certified products when the change is not extensive enough to require a new type certificate.

At the time of the occurrence, local observations indicated that there was a ragged cloud ceiling with no precipitation and the wind was calm. The surface of the water in the vicinity of the landing site had areas of glassy water and rippled water.

Wreckage information

The aircraft was recovered to a barge using heavy equipment and then transported to Port Hardy for further examination.

The float struts no longer connected the floats to the fuselage. On the forward struts, the left and right fittings had fractured on both the fuselage and float, whereas on the rear struts, only the right fitting on the float and the left fitting on the fuselage had fractured. The float front spreader bar had fractured at the interface with the left float and the rear spreader bar remained attached to both floats. The front lower left side of both float keels had indentations.

The flaps were extended on both wings, and it was determined that there were no issues with control continuity of the flight control surfaces, engine, and propeller.

The Royal Canadian Mounted Police's (RCMP's) West Coast Marine Services travelled to the site the day after the occurrence and captured underwater video of the aircraft before it was recovered from the water. The left door was found open with the upper hinge pin missing and the window intact. The right door was found closed and the window had been broken. Subsequent examination above water found that the right door handle functioned normally and the door could be opened and closed.

There was minimal damage to the interior of the aircraft cabin with sufficient occupiable space. The pilot's seat was adjusted forward for access to the aircraft controls; the front passenger's seat was adjusted further aft.

Survival aspects

Before the flight, the pilot provided a passenger briefing that emphasized the operation of the safety belts, emergency exits, and inflatable personal flotation devices (PFDs). The briefing was completed at the dock with the passengers on board the aircraft and the pilot confirmed there were no questions before departure.

All 3 occupants survived the impact and overturning of the aircraft with only minor injuries. The pilot and front passenger wore 3-point safety belts, consisting of a shoulder harness and lap strap, and the rear passenger wore a lap strap. Each lap strap had an outboard and inboard strap that connected with a buckle. The shoulder harness attached to the outboard lap strap to form the 3-point safety belt.

The pilot's shoulder harness was found disconnected from the outboard lap strap and stowed by the inertia reel. The front passenger's shoulder harness remained connected to the outboard lap strap and the lap strap was hanging from the inertia reel.

The pilot and passengers wore inflatable PFDs during the flight, but the PFDs were not inflated during the occurrence. The rear passenger had removed his inflatable PFD during the attempted

rescue and, for undetermined reasons, the front passenger no longer had his inflatable PFD on when he was removed from the water.

When the aircraft overturned, the occupants were immersed in water that had an approximate temperature of 11 °C. Sudden exposure to cold water causes a physiological gasp reflex, hyperventilation, and involuntary water intake. According to the TC publication *Survival in Cold Waters: Staying Alive,* the cold water "shock response begins at water temperatures below 25°C and peak[s] at a temperature between 10–15°C."[5]

Underwater egress

From 1990 to 2024, there were 124 fatal seaplane accidents that occurred on water in Canada, and drowning accounted for 32% of the 223 total fatalities. Following a TSB analysis of seaplane accidents,[6] it was determined that most drownings occur inside the cabin of the aircraft. The analysis also noted that, of those who survived, most experienced difficulty in exiting the aircraft.

In the occurrence aircraft, the 2 cabin doors served as the only available emergency exits. When viewed from inside the cabin, the approximate positions of the interior door handles are as follows:

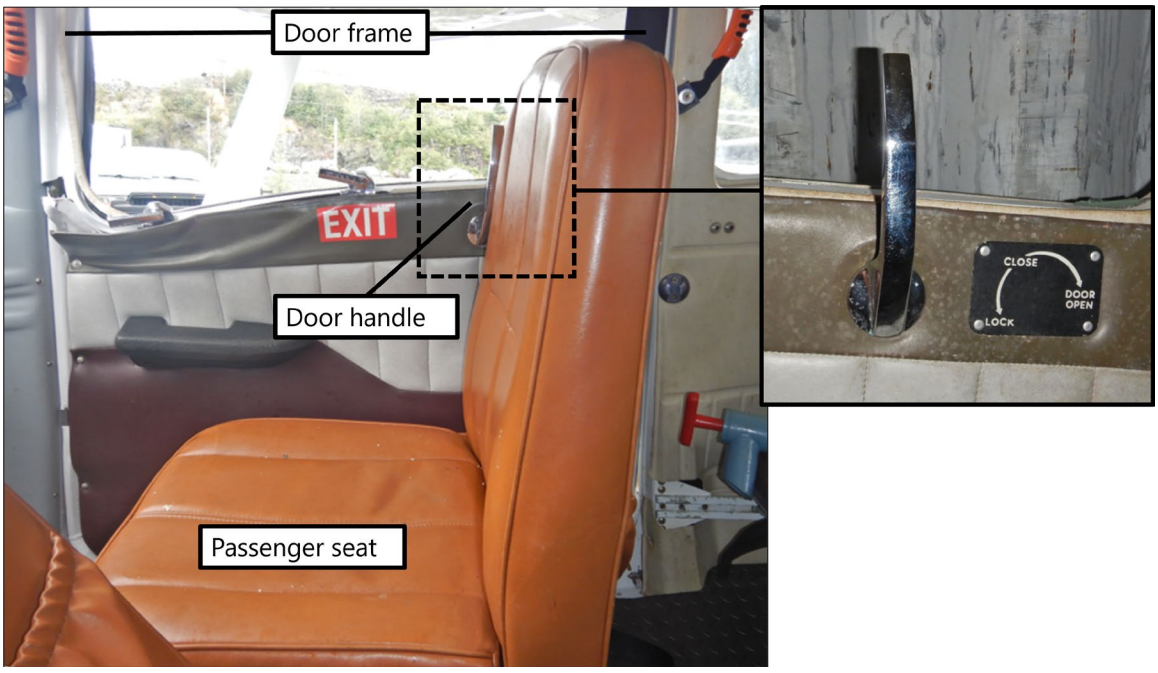
- 9 o'clock: locked
- 12 o'clock: closed
- 2 o'clock: spring loaded open to release the latch on the door

The interior door handles were located beside and behind the front seats. To open the door from the adjacent seat, the front seat occupants had to reach directly behind their shoulder and rotate the levers up and aft to the open position. With the front passenger seat being adjusted aft, the seatback lined up with the right door handle and provided approximately 2.5 cm between the seat and the handle (Figure 2).

[5] Transport Canada, TP13822E, *Survival in Cold Waters: Staying Alive* (January 2003), The Initial Responses to Immersion (Stage 1 and Stage 2) – New Scientific Information Since 1975, p. 16.

[6] TSB Aviation Safety Study SA9401: A Safety Study of Survivability in Seaplane Accidents (1994).

Figure 2. Front passenger seat position, showing the seat back aligned with the right interior door handle, and a close-up view of the interior door handle (inset) in the closed position with the placard showing the 3 handle positions (lock, close, door open) (Source: TSB)*



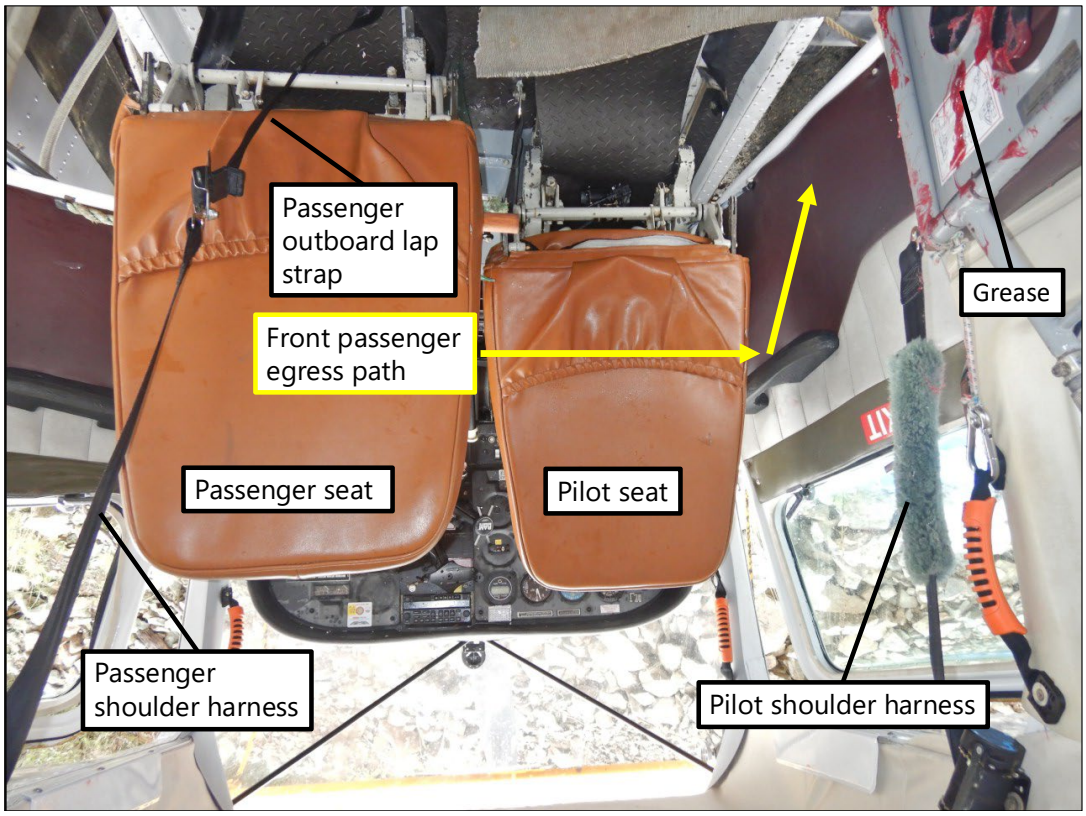
* The visible damage on the door was caused during the recovery of the aircraft.

Although the right interior door handle was found in the closed position and the left door had been opened, the investigation could not determine if either front occupant was able to rotate the door handle to the open position and thus release the latch for their respective door.

In this occurrence, all occupants exited out the left cabin door. The rear passenger initially attempted to exit the nearest right door, but the exit was fully obstructed by the front passenger, who was still in the front seat. However, the forward position of the pilot's seat provided enough space for the rear passenger to egress out the left door. The rear passenger then pulled the pilot out of the same exit.

The front passenger crossed the cabin to exit through the left door (Figure 3). Based on the pilot seat position, the front passenger had to move past the pilot seatback and the safety belts in dark and cold water to reach the door. During the egress, the passenger's left leg likely became entangled in a loop created by the front passenger seat's shoulder harness and lap strap and, even though the straps were fully extended, they prevented the passenger from completely surfacing.

Figure 3. The inverted occurrence aircraft cockpit illustrating the egress route of the front passenger with the passenger shoulder harness connected to the outboard lap strap and the pilot shoulder harness disconnected from the outboard lap strap. The red grease was part of the cargo being transported to the logging camp. (Source: TSB)



In 2012, the Office of the Chief Coroner of BC prepared a report after there were 4 commercial seaplane accidents on BC's coast from 2005 to 2009.[7] The report recommended to TC that "enhanced safety briefings outlining underwater egress procedures be mandatory on all commercial seaplane flights."[8] The *Commercial Air Service Standards* do not mandate this briefing either verbally or on the safety features card for commercial or private air operators.

TC has an online resource for both air operators and passengers when flying on seaplanes. The website[9] provides an underwater egress briefing that can be used by air operators as well as a safety brochure, *Seaplane/Floatplane: A Passenger's Guide*[10] (Appendix A), that can be distributed to passengers.

The report from the Office of the Chief Coroner also strongly recommended underwater egress training for "passengers who frequently fly over water, such as workers commuting to remote

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[7] Report to the Chief Coroner of British Columbia, *Death Review Panel: Four Fatal Aviation Accidents Involving Air Taxi Operations on British Columbia's Coast* (March 2012).

[8] Ibid., Item 12, p. 15.

[9] Transport Canada, "Flying On Board Seaplanes/Floatplanes," at https://tc.canada.ca/en/aviation/commercial-air-services/carrying-passengers/floatplanes (last accessed on 13 March 2026).

[10] Transport Canada, TP12365E, *Seaplane/Floatplane - A Passenger's Guide*.

coastal workplaces."[11] The rear passenger had completed underwater egress training on 3 occasions with the last training in October 2022. The investigation could not determine if the front passenger had received underwater egress training.

Glassy-water landings

The pilot was experienced in landing on water; however, glassy-water conditions are considered to be difficult for landing a seaplane regardless of pilot experience. The mirror effect created during glassy-water conditions affects depth perception making it difficult to judge the aircraft's height above water and forward speed.

The TSB has investigated multiple accidents[12] where glassy-water conditions were a contributing factor. In 1 case involving a Cessna 185E on amphibious floats, the aircraft cartwheeled and sank after the floats dug into the water on landing, resulting in fatal injuries to the pilot.[13]

If glassy-water conditions exist, the *Transport Canada Aeronautical Information Manual* (TC AIM) recommended practice is to establish a nose-high attitude with a minimum rate of descent at approximately 200 feet above the surface and then maintain the approach speed until the aircraft contacts the surface.[14] In addition, the occurrence aircraft's pilot operating handbook recommends a flap setting of 20° and no flare before touchdown.[15] The investigation could not determine the pitch of the aircraft during touchdown.

TSB laboratory reports

The TSB completed the following laboratory reports in support of this investigation:

- LP162/2024 – NVM [non-volatile memory] Data Recovery – GPS and Flight Tracker
- LP177/2024 – NVM Data Recovery – Cellphone
- LP025/2025 – Shoulder Harness Examination

Safety messages

Glassy-water conditions are difficult conditions for landing a seaplane, regardless of pilot experience. Pilots must recognize glassy-water conditions and ensure they use the appropriate landing technique.

During an underwater egress, aircraft occupants face multiple hazards such as spatial disorientation, limited time for egress, aircraft equipment obstacles, and cold-water shock. To

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[11] Report to the Chief Coroner of British Columbia, *Death Review Panel: Four Fatal Aviation Accidents Involving Air Taxi Operations on British Columbia's Coast* (March 2012), Item 12, p. 15.

[12] TSB air transportation safety investigation reports A21Q0097, A14O0077, A11W0070, A06C0131, A05P0262, and A02P0256.

[13] TSB Aviation Investigation Report A14O0077.

[14] Transport Canada, TP14371E, *Transport Canada Aeronautical Information Manual* (TC AIM), AIR – Airmanship (21 March 2024), Section 2.11.4, *Landing Seaplanes on Glassy Water,* p. 409.

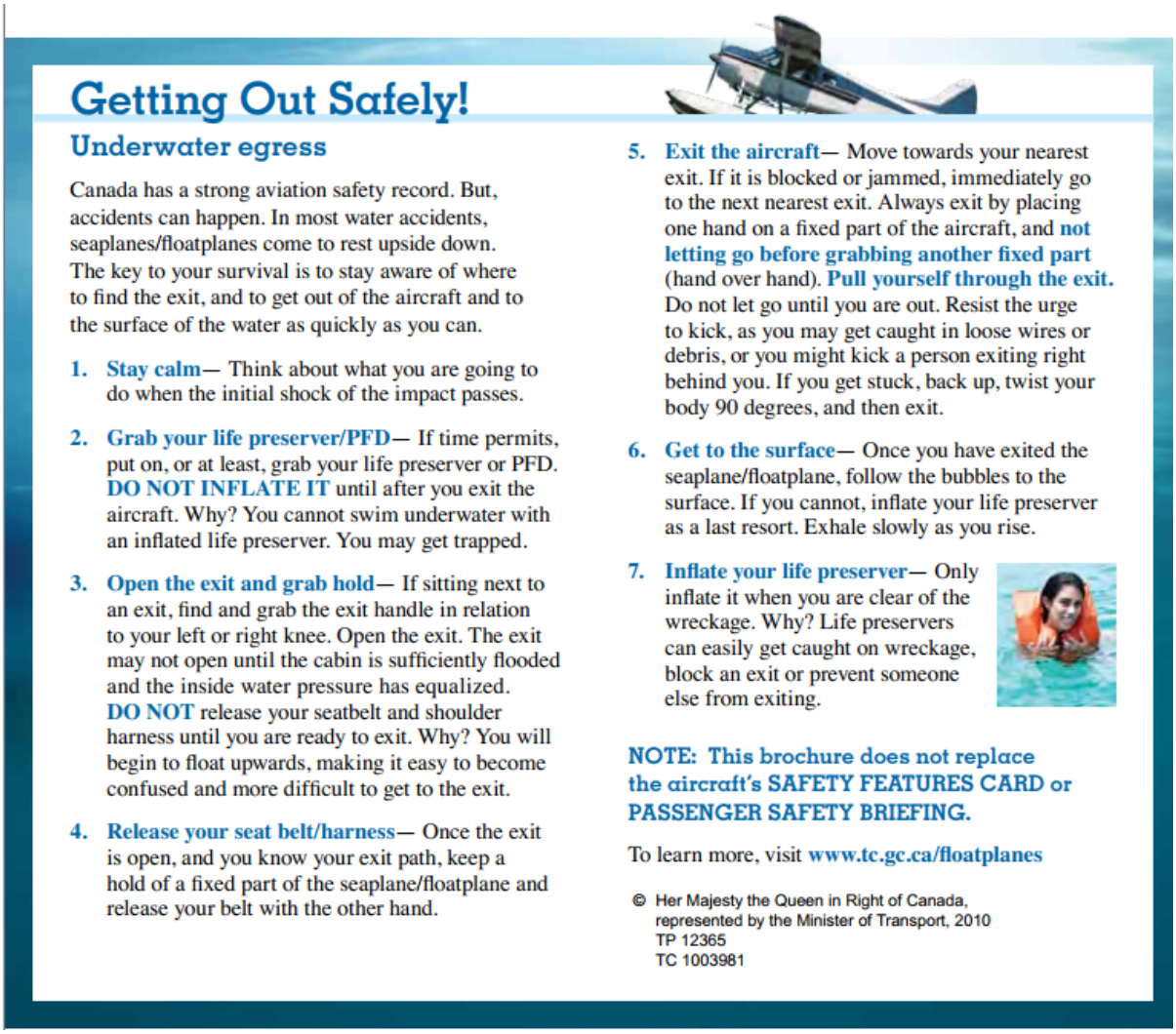
[15] Cessna Aircraft Company, *Pilot's Operating Handbook and FAA Approved Airplane Flight Manual*, Revision 1 (01 December 1978), Section 9: Supplements-Floatplane, Section 4: Normal Procedures, Amplified Procedures, Landing.

improve mental preparation and increase the likelihood of survival, the pilot's pre-flight safety briefing should include underwater egress techniques that are described in TC's seaplane passenger's guide.

This report concludes the Transportation Safety Board of Canada's investigation into this occurrence. The Board authorized the release of this report on 27 May 2026. It was officially released on 18 June 2026.

Appendices

Appendix A – Information about underwater egress from Transport Canada's *Seaplane/Floatplane: A Passenger's Guide*



Getting Out Safely!

Underwater egress

Canada has a strong aviation safety record. But, accidents can happen. In most water accidents, seaplanes/floatplanes come to rest upside down. The key to your survival is to stay aware of where to find the exit, and to get out of the aircraft and to the surface of the water as quickly as you can.

1. **Stay calm**— Think about what you are going to do when the initial shock of the impact passes.
2. **Grab your life preserver/PFD**— If time permits, put on, or at least, grab your life preserver or PFD. **DO NOT INFLATE IT** until after you exit the aircraft. Why? You cannot swim underwater with an inflated life preserver. You may get trapped.
3. **Open the exit and grab hold**— If sitting next to an exit, find and grab the exit handle in relation to your left or right knee. Open the exit. The exit may not open until the cabin is sufficiently flooded and the inside water pressure has equalized. **DO NOT** release your seatbelt and shoulder harness until you are ready to exit. Why? You will begin to float upwards, making it easy to become confused and more difficult to get to the exit.
4. **Release your seat belt/harness**— Once the exit is open, and you know your exit path, keep a hold of a fixed part of the seaplane/floatplane and release your belt with the other hand.
5. **Exit the aircraft**— Move towards your nearest exit. If it is blocked or jammed, immediately go to the next nearest exit. Always exit by placing one hand on a fixed part of the aircraft, and **not letting go before grabbing another fixed part** (hand over hand). **Pull yourself through the exit.** Do not let go until you are out. Resist the urge to kick, as you may get caught in loose wires or debris, or you might kick a person exiting right behind you. If you get stuck, back up, twist your body 90 degrees, and then exit.
6. **Get to the surface**— Once you have exited the seaplane/floatplane, follow the bubbles to the surface. If you cannot, inflate your life preserver as a last resort. Exhale slowly as you rise.
7. **Inflate your life preserver**— Only inflate it when you are clear of the wreckage. Why? Life preservers can easily get caught on wreckage, block an exit or prevent someone else from exiting.

NOTE: This brochure does not replace the aircraft's SAFETY FEATURES CARD or PASSENGER SAFETY BRIEFING.

To learn more, visit **www.tc.gc.ca/floatplanes**

TP 12365
TC 1003981

Source: Transport Canada, TP12365E, *Seaplane/Floatplane: A Passenger's Guide* (June 2010), p. 3, at https://tc.canada.ca/en/aviation/publications/seaplane-floatplane-passenger-s-guide-tp-12365 (last accessed on 28 May 2026).

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