



Transportation
Safety Board
of Canada

Bureau de la sécurité
des transports
du Canada



AIR TRANSPORTATION SAFETY INVESTIGATION REPORT A23Q0088

LOSS OF CONTROL AND COLLISION WITH GROUND

Orizon Aviation Québec Inc.
Cessna 152, C-FNBP
Québec/Jean Lesage International Airport, Quebec
01 August 2023

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Background

On 01 August 2023, at approximately 0702 Eastern Daylight Time,¹ the Cessna 152 aircraft (registration C-FNBP, serial number 15281467), operated by Orizon Aviation Québec Inc. (Orizon Aviation), departed Runway 29 at Québec/Jean Lesage International Airport (CYQB), Quebec, with a student pilot and his instructor on board, in preparation for the student pilot's first solo flight. The student pilot carried out 8 touch-and-go manoeuvres during the flight, which ended at 0853. The instructor deemed the flight satisfactory and felt that the student pilot was ready for his first solo flight. The instructor and the student pilot agreed that the student pilot would take off from Runway 29 and immediately enter the circuit to return to land on Runway 24.

¹ All times are Eastern Daylight Time (Coordinated Universal Time minus 4 hours).

History of the flight

About 10 minutes later, once the solo flight had been authorized by a check instructor,² the student pilot departed alone at the controls of the aircraft and taxied to Runway 29 for takeoff. He took off at approximately 0906 and made an initial climbing right turn to join the circuit for an approach to Runway 24.

When the aircraft was on the downwind leg, the tower instructed the student pilot to “extend the downwind,” which the student pilot did. Fifty-four seconds later, the tower authorized him to turn to join the base leg. The aircraft crossed the threshold of Runway 24 at 0920 at a height of approximately 60 feet above ground level (AGL) and landed on the runway approximately 550 feet beyond the runway threshold. An analysis of video footage recorded by the airport’s surveillance cameras suggests that, on initial touchdown, the aircraft’s nose wheel hit the ground first, causing the aircraft to bounce³ before touching down again approximately 350 feet away.

An uncontrolled lateral deviation followed, and the aircraft veered off the left side of the runway. The student pilot then initiated a go-around. The aircraft took off again, and the student pilot attempted to regain altitude over the grassy area between the runway and Taxiway D, while gradually turning toward the airport terminal building. At that time, the aircraft was in slow flight⁴ and still near the ground.

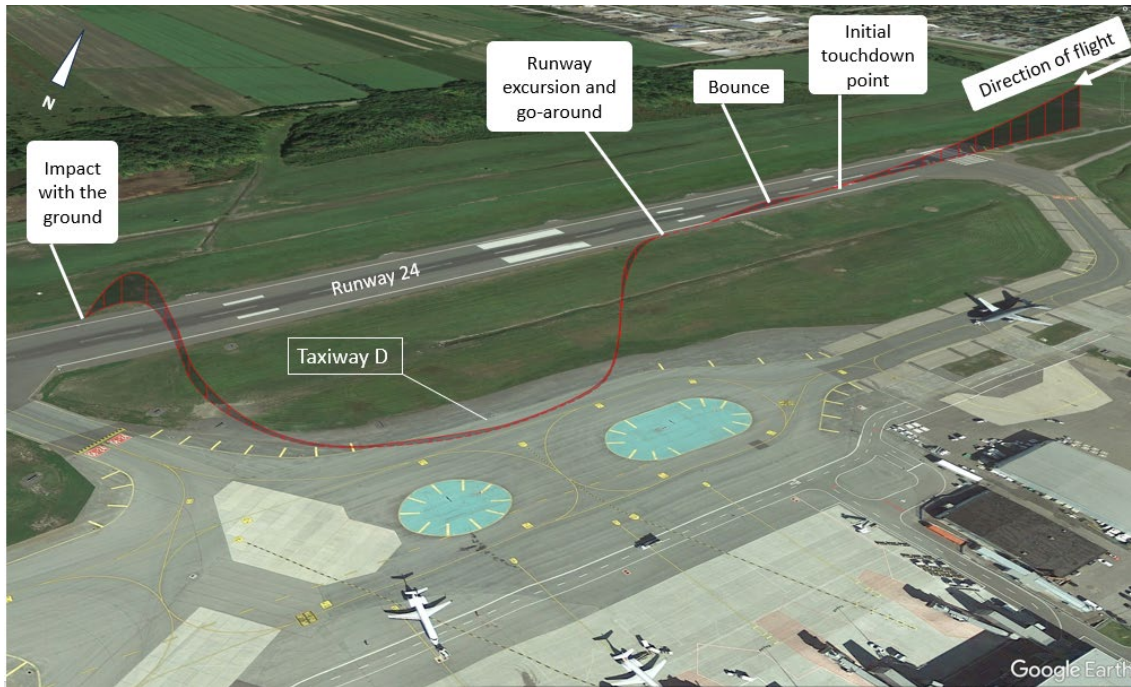
The aircraft reached Taxiway D, which the student pilot flew over at a few feet above the ground, attempting to regain altitude. Seeing that he was heading toward the control tower and terminal building, the student pilot turned to the right, away from them and back toward Runway 24. When the aircraft reached Runway 24, it was able to climb to approximately 45 feet AGL by making a left turn. The left wing then stalled, and the aircraft rolled to the left and entered a spin before crashing on the edge of the runway (Figure 1). The aircraft collided with the ground in an almost-vertical, nose-down attitude, and then rolled onto its back.

² A check instructor is an instructor who has more experience than the one normally assigned to the student.

³ “A bounce will almost certainly occur if the round out is made too slowly or too late so that the nose gear (in the case of tricycle geared aeroplanes) [...] touches first.” (Source: Aviation Publishers Co. Ltd., *From the Ground Up*, 30th Edition [2023], Section 10.5.8: Landing Errors, p. 313.)

⁴ Transport Canada’s *Flight Training Manual* defines slow flight as, “that range of airspeeds between the maximum endurance speed for a particular aircraft and the point just above its stalling speed for the existing conditions.” (Source: Transport Canada, TP 1102E, *Flight Training Manual*, 4th Edition [revised August 2004], Exercise Eleven: Slow Flight, p. 73.)

Figure 1. Map showing the sequence of the accident at Québec/Jean Lesage International Airport, Quebec. All annotations related to aircraft operations are approximate. (Source: Google Earth, with TSB annotations)



The airport's emergency services responded quickly and were on site in less than 4 minutes. There was no fire. The student pilot was wearing his safety belt, consisting of a lap strap and shoulder harness, but was nevertheless seriously injured. The 406 MHz emergency locator transmitter activated.

Wreckage examination

The aircraft collided with the ground in an almost-vertical attitude, on a grassy surface.

The propeller damage was consistent with an engine that was producing power at the time of impact, but the amount of power it was producing could not be determined. Flight control cable continuity was confirmed from the elevators to the seats, from the rudder to the rudder pedals, and from the ailerons to the fuselage. The position of the flap actuator indicated that the flaps were at approximately 13° at the time of impact.

Figure 2. Occurrence wreckage (Source: Québec/Jean Lesage International Airport's Airport Security Service, with TSB annotations)



The aircraft systems were examined to the extent possible, and no signs of failure were observed.

Video footage of the occurrence recorded by airport surveillance cameras was reviewed and showed that the left rudder pedal was applied when the aircraft entered an incipient spin.

Aerodrome information

CYQB consists of two 150-foot-wide paved runways, Runway 11/29 and Runway 06/24, which are 5700 and 9000 feet long, respectively.

The occurrence aircraft was detected on NAV CANADA's primary⁵ and secondary⁶ radars from the beginning of the flight. However, the aircraft disappeared from the radar display when it turned on final for Runway 24. According to NAV CANADA's technical analysis, the aircraft may have been pitched downward while on the final approach slope, which may have caused the transponder antenna to disappear momentarily from the secondary radar detection field. As a result, there was insufficient data to determine the precise airspeed and rate of descent before the occurrence.

Weather information

The weather conditions at CYQB were suitable for visual flight rules flight and are not considered a factor in this occurrence.

Flight training unit information

Orizon Aviation is a flight training unit certified by Transport Canada (TC) since 2004 and based at CYQB. It offers a variety of training programs for private and commercial licences and ratings on Cessna 152 and 172 and Piper PA31 aircraft.

Airline transport pilot licence integrated course information

The student pilot was enrolled in the airline transport pilot licence, or ATP(A), integrated course offered by Orizon Aviation. According to Standard 426 of the *Canadian Aviation Regulations* (and Orizon Aviation's TC-approved training manual⁷), the aim of this course is

to train pilots to the level of proficiency necessary to enable them to operate as co-pilot on multi-crew, multi-engine aeroplanes in commercial air transportation and to obtain the commercial

⁵ Primary radar is a system in which a minute portion of a radio pulse transmitted from a station is reflected by an object and then received back at that station for processing and display in an air traffic control facility.

⁶ Secondary radar is a system in which radio pulses transmitted from a transmitter/receiver (interrogator) are received in complementary equipment installed in the aircraft in the form of a receiver/transmitter (transponder). The transponder is used to trigger a distinctive response transmission, rather than a reflected signal. This response is sent back to the interrogator for processing and display at an air traffic control facility.

⁷ Orizon Aviation Québec Inc., *Manuel de formation – Cours intégré menant à la licence de pilote de ligne avion ou ATP(A)* (01 December 2022).

pilot licence — aeroplane, the multi-engine class rating and the Group 1 instrument rating (CPL(A)/IR).⁸

Student pilot information

The student pilot held a Category 1 medical certificate, which was issued on 28 September 2022, and a student pilot permit, which was issued on 18 May 2023.

He had begun ground school training for his ATP(A) integrated course on 13 March 2023, and his flight training on 28 March 2023 at CYQB on a Cessna 152 aircraft.

At the time of the occurrence, 4 months and 4 days later, the pilot had accumulated 23.7 hours of dual flight time. During his training, he had been supervised by 3 different instructors. After completing 2 progress monitoring flights, on 25 May and 05 July 2023, he completed several flights with a 3rd instructor, who recommended him for a pre-solo evaluation flight. During the evaluation flight, on 26 July, the check instructor noted certain deficiencies, particularly with respect to the approach, maintaining airspeed, attitude, and movements. Three additional correction flights were required, the last of which took place on 01 August 2023. Following these 3 flights, the pilot was recommended for his first solo flight, and this recommendation was approved by the check instructor who had conducted the pre-solo evaluation flight on 26 July.

Aircraft information

According to the technical records, the aircraft had accumulated 15 527.5 hours total air time since manufacture. The aircraft's weight and balance report indicates that the aircraft was within the prescribed limits at the time of the occurrence.

There was no indication that a component or system malfunction played a role in this occurrence.

Rejected landings and go-around procedures

The pilot had received training in accordance with Orizon Aviation's training manual, as well as the TC *Flight Instructor Guide*⁹ and *Flight Training Manual*.¹⁰

In this occurrence, the go-around occurred when the aircraft had, or was about to, veer off the runway. The ensuing take-off attempt was unsuccessful because the aircraft was in slow flight and no longer had sufficient speed to successfully climb.

The choice between a go-around and a continued landing depends on the aircraft's airspeed and height, as well as the pilot's skills. The general go-around technique described in the *Flight Training Manual* assumes that the aircraft has sufficient speed to resume flight.¹¹

⁸ Transport Canada, SOR/96-433, *Canadian Aviation Regulations*, Standard 426, Division VIII: Integrated Course, section 426.75: Requirements, Airline Transport Pilot Licence — ATP(A) Integrated Course.

⁹ Transport Canada, TP 975E, *Flight Instructor Guide* (September 2004).

¹⁰ Transport Canada, TP 1102E, *Flight Training Manual*, 4th Edition (revised August 2004).

¹¹ *Ibid.*, Exercise Eighteen: Approach and Landing, Recovering from Bad Landings, p. 112.

TC's *Flight Instructor Guide* states that the instructor must explain to the student pilot the go-around techniques with respect to power, attitude, carburetor heat, flap retraction, and flight path in relation to the runway,¹² and must demonstrate them from a rejected landing.

Neither the *Flight Training Manual* nor the *Flight Instructor Guide* address the actions to be taken in the event of a runway excursion.

The manual *From the Ground Up* specifies that

[a] go-around can become a very risky flight procedure if the pilot does not decide soon enough that a go-around is the best choice and delays making a decision until the situation has become critical.¹³

As explained in TC's *Aviation Safety Letter*, many landing accidents are due to the pilot's failure to conduct a pre-emptive and timely go-around.¹⁴

Safety action taken

In the days following the occurrence, Orizon Aviation implemented a procedure stipulating that if student pilots fail their first pre-solo evaluation, they must be evaluated again by a check instructor following their correction flights, before being authorized to conduct their first solo flight.

Safety messages

Pilots are reminded of the importance of being vigilant upon landing to quickly detect any signs that a go-around is required, and to be able to initiate the go-around at the appropriate time.

This report concludes the Transportation Safety Board of Canada's investigation into this occurrence. The Board authorized the release of this report on 26 June 2024. It was officially released on 04 July 2024.

Visit the Transportation Safety Board of Canada's website (www.tsb.gc.ca) for information about the TSB and its products and services. You will also find the Watchlist, which identifies the key safety issues that need to be addressed to make Canada's transportation system even safer. In each case, the TSB has found that actions taken to date are inadequate, and that industry and regulators need to take additional concrete measures to eliminate the risks.

¹² Transport Canada, TP 975E, *Flight Instructor Guide* (September 2004), Exercise 18: The Approach and Landing, p. 104.

¹³ Aviation Publishers Co. Ltd., *From the Ground Up*, 30th Edition (2023), Section 10.5.10: Go-Around/Overshoot, pp. 313-314.

¹⁴ Transport Canada, "Stabilized Approaches in VFR [visual flight rules]," in *Aviation Safety Letter* (Issue 01/2020), p. 8 at tc.canada.ca/sites/default/files/2020-05/ASL1-2020.pdf (last accessed on 20 June 2024).

ABOUT THIS INVESTIGATION REPORT

This report is the result of an investigation into a class 4 occurrence. For more information, see the Policy on Occurrence Classification at www.tsb.gc.ca

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