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

AIR TRANSPORTATION SAFETY INVESTIGATION REPORT A25C0103

COLLISION WITH TERRAIN

MHA Enterprises Ltd.
De Havilland Aircraft of Canada Limited DHC-2 Mk. I (Beaver), C-FDPW
Makepeace Lake, Manitoba, 0.5 NM N
13 September 2025

The Transportation Safety Board of Canada (TSB) investigated this occurrence for the purpose of advancing transportation safety. It is not the function of the Board to assign fault or determine civil or criminal liability. **This report is not created for use in the context of legal, disciplinary, or other proceedings**. See the Terms of use at the end of the report. Masculine pronouns and position titles may be used to signify all genders to comply with the *Canadian Transportation Accident Investigation and Safety Board Act* (S.C. 1989, c. 3).

History of the flight

On 13 September 2025, the float-equipped De Havilland Aircraft of Canada Limited DHC-2 Mk. I (Beaver) aircraft (registration C-FDPW, serial number 1339), operated by MHA Enterprises Ltd. (MHA), was scheduled to conduct, 3 round-trip flights under day visual flight rules (VFR) from its float operations base in St. Theresa Point.[1] The 1st and 2nd flights of the day were conducted to locations in northern Manitoba and were reported to be uneventful. The 3rd flight, scheduled to depart at 1500,[2] was to take 4 passengers from the float base at St. Theresa Point to a remote camp at Makepeace Lake.

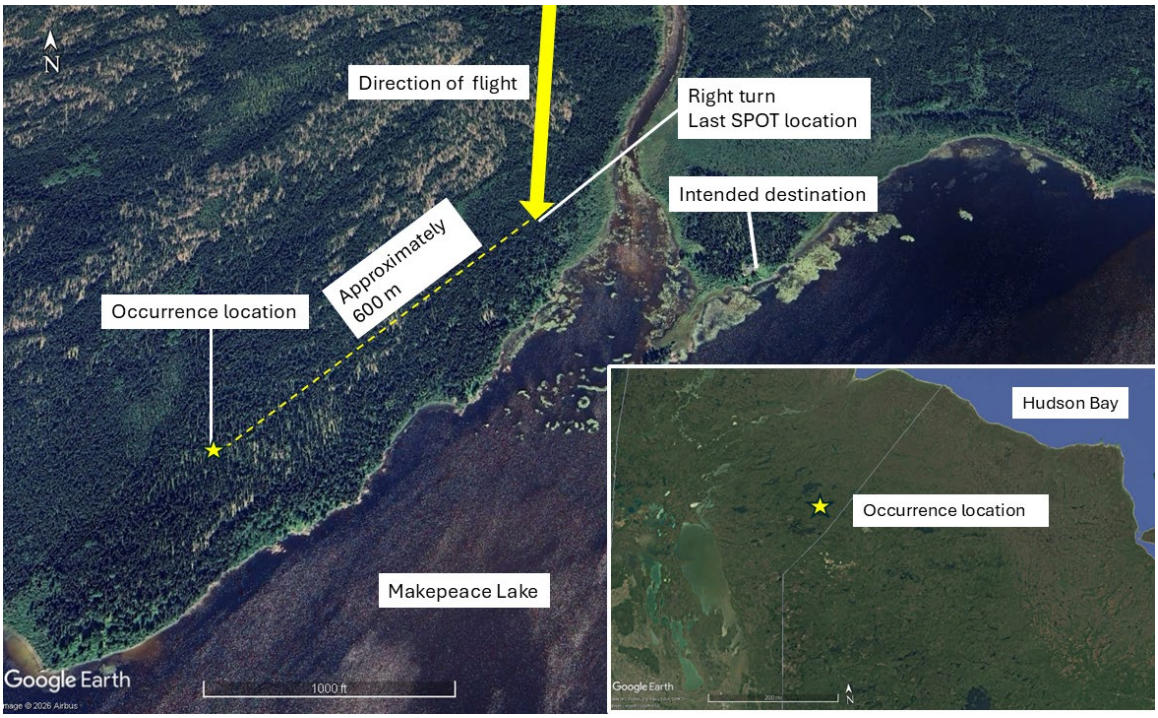
[1] All locations mentioned in the report are in the province of Manitoba, unless otherwise noted.

[2] All times are Central Daylight Time (Coordinated Universal Time minus 5 hours).

Canada

The pilot loaded the aircraft at approximately 1430 with camp supplies, including rifles and 2 jerricans filled with gasoline. The pilot made 2 attempts to take off but was told to return to the dock by one of the passengers who had anxiety about flying. Once back at the dock, the decision was made to unload the aircraft and cancel the flight for the day. At approximately 1700, the passengers called to reschedule the flight for 1800. The cargo was reloaded onto the aircraft, and the passengers boarded. At approximately 1830, the aircraft completed its takeoff and proceeded to Makepeace Lake. The flight was reported to be smooth and uneventful. When nearing Makepeace Lake, the pilot turned right and flew along the north shore of the lake for approximately 600 m[3] before colliding with trees and terrain in the forest (Figure 1). A post-impact fire ensued.

Figure 1. Map showing the occurrence location, intended destination, and final path of the aircraft, with a wider area view in inset (Source of both images: Google Earth, with TSB annotations)



The emergency locator transmitter (ELT) activated, and the Joint Rescue Coordination Centre (JRCC) located in Trenton, Ontario, was notified of the signal at 1839; however, the signal stopped transmitting shortly after, presumably as a result of the post-impact fire. The pilot's mobile phone had crash detection capability, and at 1840, Northern911 emergency services received an alert with global positioning system (GPS) coordinates. Island Lake Royal Canadian Mounted Police (RCMP) responded and arrived at the accident site at 2123. The 4 passengers were fatally injured. The RCMP found the seriously injured pilot 150 m from the aircraft and began providing care. Search and rescue technicians arrived at 2307 and took over. The pilot was evacuated by helicopter from the crash site to Island Lake Airport (CYIV) and then transported by aircraft to hospital in Winnipeg.

[3] Distance based on the last location recorded on the pilot's SPOT satellite tracking device.

Weather information

There is no aerodrome routine meteorological report (METAR) for Makepeace Lake; the closest weather station is CYIV, located 27 nautical miles (NM) north-northeast of the accident site.

The automatic METAR issued at 1800 for CYIV indicated the following:

- Winds from 140° true (T) at 5 knots
- Visibility of 9 statute miles (SM)
- Clear skies
- Temperature 20.6 °C and dew point 8.7 °C
- Altimeter setting 30.09 inches of mercury (inHg)

The weather conditions were suitable for VFR flight and are not considered a factor in this occurrence.

Air operator information

MHA is an air operator based in St. Theresa Point that operates flights under Subpart 702 (Aerial Work) and Subpart 703 (Air Taxi Operations) of the *Canadian Aviation Regulations* (CARs); the occurrence flight was operated under CARs Subpart 703. At the time of the occurrence, MHA operated 2 DHC-2 Mk. Is, 3 Cessna 185s on floats and wheel skis, and 3 PA-32-300s. MHA offers year-round air transport services, which support the remote Indigenous communities with their trapping, hunting, and commercial fishing activities.

Pilot information

The pilot held a commercial pilot licence - aeroplane, which was the appropriate licence to conduct the flight in accordance with existing regulations. He had accumulated 1910 total flight time hours, including approximately 140 hours on type. The pilot's Category 1 medical certificate was valid. There is no indication that the pilot's performance was negatively affected by fatigue or any medical factors.

Aircraft information

The occurrence aircraft was a single-engine De Havilland Aircraft of Canada Limited DHC-2 Mk., built in 1959. At the time of the occurrence, it was equipped with EDO 4930 floats, 5 seats, and it had accumulated an estimated 15 166 hours total time since new.

Based on the aircraft's weight and balance amendment dated 01 May 2023, the aircraft had the following supplemental type certificates (STCs) installed:

- Transport Canada (TC)-approved SA04-71, *Relocation of engine 9.75 " forward including modification of engine mount*
- TC-approved SA93-64, *Gross Weight Increase To 5370 Pounds*
- Federal Aviation Administration (FAA)-approved SA711GL, *Install Pilot, Co-pilot, and passenger seats according to Wipaire, Incorporated "Installation Instructions, W-DHC2-01",*

Revision A, dated September 22, 1983, or later FAA-approved revisions,[4] which upgraded the pilot and co-pilot seats with safety belts consisting of lap straps and shoulder harnesses[5]

- TC SA92-45, *Installation of Baron STOL [short takeoff and landing] Systems STOL Kit*, which included an aerodynamic stall warning system[6]

There were no recorded defects outstanding at the time of the occurrence and no indication that a component or system malfunction played a role in this occurrence.

Weight and balance

The investigation determined that the aircraft weighed approximately 5274 pounds at the time of takeoff, below the maximum allowable takeoff weight of 5370 pounds. However, using the current weight and balance amendment, TSB calculations placed the aircraft's centre of gravity (CG) at 109.2 inches, i.e., 3.1 inches aft of the rear limit of 106.1 inches.

According to the manufacturer, the typical CG of an empty DHC-2 Mk. I on floats is about 95 inches. In contrast, based on the most recent weight and balance amendment, the CG of the occurrence aircraft empty on floats was 103.52 inches. The operator had noticed that the calculated CG after loading the aircraft was usually showing outside the aft limit and believed there was an inaccuracy with the empty CG calculation; however, no steps were taken to confirm the empty CG calculation. Because the aircraft's historical weight and balance records were destroyed in the post-impact fire, the investigation could not verify the accuracy of the calculated CG.

Effects of an aft centre of gravity

An aircraft loaded with a CG behind the aft limit becomes less stable in pitch, more sensitive to control inputs, and significantly harder to recover from a stall. With the CG farther back, the tail produces less downward force, which reduces drag and improves performance, giving the aircraft better fuel efficiency and a slightly lower stall speed. However, this comes at the cost of reduced longitudinal stability, meaning the aircraft is more prone to pitching up and can feel overly responsive. Most critically, an aft CG condition can make stall recovery difficult or even impossible because the elevator may not have enough authority to lower the nose.

Occurrence site and wreckage examination

After colliding with trees and terrain in the forest, the aircraft caught fire, and the flames propagated to the surrounding foliage. The size of the crash site and evidence on the surrounding trees indicate that the aircraft's angle of descent was very steep (Figure 2).

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[4] FAA-approved SA711GL is also approved by TC under TC STC 85-9.

[5] At the time the aircraft was manufactured, the regulations did not require shoulder harnesses on all seats, and the rear seats were equipped with lap straps only.

[6] The flight manual supplement (FMS) for STC SA93-64 changes the stalling speeds indicated originally in the aircraft flight manual (AFM) from 60 mph to 63 mph for flaps up and from 45 mph to 57 mph for flaps down (landing) while on floats.

Figure 2. Aerial view of the occurrence site showing the direction of flight and the wreckage (Source: TSB)



There was no indication of an in-flight breakup; all parts of the aircraft were found on site and all wing, tail, and flight control attach points were intact. The direction of travel was east-southeast, and the aircraft fuselage was found on its right side, facing the west-northwest direction, with the engine and propeller still attached.

The post-impact fire destroyed most of the aircraft, including parts of the engine and firewall, cockpit instruments, the entire fuselage, and the cabin to the rear bulkhead. The tail was found upright with burn damage to the horizontal stabilizer and the left elevator.

Continuity checks of all cockpit flight controls and the right wing could not be completed because of the damage and post-impact fire; however, it was possible to establish continuity of the elevator and rudder controls at the tail as well as the left-wing aileron and flap controls at the left-wing root. It was not possible to determine the flap position at the time of the accident.

Given the destructive nature of the fire, it was not possible to determine its origin. The DHC-2's main fuel tanks are located directly under the passenger cabin floor, between the main landing gear attach points. As noted in a previous TSB investigation,[7] this location makes the fuel tanks vulnerable in the event of an accident and places the occupants within the flame front of a fuel-fed fire should ignition occur.

[7] TSB Aviation Investigation Report A15Q0120.

The engine and the propeller were examined by overhaul facilities under TSB supervision, and there was no indication of the malfunction of either one. Further analysis of the propeller by the type certificate holder found it to be in fine pitch at the time of the accident.

Transportation of dangerous goods

The *Transportation of Dangerous Goods Regulations* (TDGR) allow remote operators to load fuel containers into the cabin of a passenger aircraft in certain circumstances. The transportation of the 2 jerricans of fuel in the occurrence aircraft cabin was allowed under the Limited Access provision of the TDGR[8] and MHA's *702/703 Dangerous Goods Operations Manual*.[9]

In the event of a crash, fuel or other flammable materials in the aircraft cabin may significantly increase the size and intensity of a resulting fire.

Lightweight flight data recording

The occurrence aircraft was not equipped with a flight data recorder (FDR) or a cockpit voice recorder (CVR), nor was either required by regulation.

The benefits of recorded flight data in aircraft accident investigations are well known and documented. FDRs and CVRs can provide large amounts of flight data that assist investigators to determine the causes of an accident.

To provide an accessible and feasible means of recording flight data information, regardless of the type of aircraft and operation flown, several lightweight FDR systems currently manufactured can record combined cockpit image, cockpit audio, aircraft parametric data, and/or data-link messages.

On 26 April 2018, the TSB issued Recommendation A18-01, which reads as follows:

> The Transportation Safety Board of Canada recommends that the Department of Transport require the mandatory installation of lightweight flight recording systems by commercial operators and private operators not currently required to carry these systems.
>
> **TSB Recommendation A18-01**

In its December 2024 response, TC indicated that it had removed the development of regulations to mandate the installation of lightweight data recorders (LDRs) from its forward regulatory plan, so no work would be initiated before 2028 at the earliest. Although in its latest response, dated December 2025, TC reiterated that it agreed in principle with the recommendation, it also stated that priorities would continue to be reassessed and work on the issue of LDRs would resume when resources permit.

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[8] Transport Canada, SOR/2001-286, *Transportation of Dangerous Goods Regulations*, section 12.9: Limited Access.

[9] MHA Enterprises Ltd., *702/703 Dangerous Goods Operations Manual* (31 August 2013), Chapter 1, p. 7.

It is therefore unlikely that TC will have regulatory requirements mandating the installation of LDRs before 2030, which will be 20 years after the International Civil Aviation Organization (ICAO) introduced the requirement and 12 years after the TSB issued this safety recommendation.

The Board remains concerned with the lengthy delays, lack of progress, and potential change in scope in the development of regulations mandating LDRs.

Therefore, the Board considers the response to Recommendation A18-01 to be **Unsatisfactory** and has assigned the **Dormant**[10] status to this recommendation[11].

Survivability

Northern911 emergency services received an alert from the pilot's phone crash detection feature and contacted the RCMP at 1845. Coordination with the JRCC was done to facilitate the rescue and evacuation of the pilot in the very remote location of the accident.

The crash detection feature works by combining data from several phone sensors and algorithms to recognize the signature of a severe crash. The device monitors sudden changes in motion using a high-g accelerometer and gyroscope, listens for loud impact-related sounds through the microphone, and detects shifts in cabin pressure with the barometer. The phone displays an alert and begins a 20-second countdown before automatically calling emergency services if the user does not respond. When there is no cellular or wifi connection, the phone will try to contact emergency services via satellite.

Safety messages

The investigation could not determine the final moments of the flight. The TSB reiterates that the installation of LDRs in commercial aircraft would make key information available for investigations, which could aid in advancing aviation safety.

Before dispatching an aircraft, owners and operators must make an accurate weight and balance report available to pilots so that they can load cargo and passengers within the aircraft's CG limit.

Pilots must remain aware that an aircraft loaded outside its CG limits can change flight characteristics in unanticipated ways that can result in a loss of control.

This report concludes the Transportation Safety Board of Canada's investigation into this occurrence. The Board authorized the release of this report on 19 August 2026. It was officially released on 19 November 2026.

[10] A recommendation is assigned the **Dormant** status when the assessment determines that there is a residual risk, but no further action is planned to be taken, and continued assessment will not likely yield further results.

[11] TSB Recommendation A18-01: Mandatory installation of lightweight flight recording systems (issued 26 April 2018), at https://www.tsb.gc.ca/eng/recommandations-recommendations/aviation/2018/rec-a1801.html (last accessed on 03 November 2026).

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.

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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