

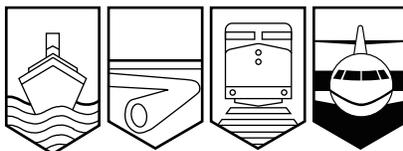
Transportation Safety Board  
of Canada



Bureau de la sécurité des transports  
du Canada

## AVIATION INVESTIGATION REPORT

A04C0051



### LOSS OF VISUAL REFERENCE — COLLISION WITH TERRAIN

STANDARD Ag HELICOPTERS

BELL 206B JET RANGER HELICOPTER C-FIHL

SWIFT CURRENT, SASKATCHEWAN 4NM SW

04 MARCH 2004

Canada

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.

## Aviation Investigation Report

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### *Summary*

The leased Bell 206B helicopter (registration C-FIHL, serial number 2077) was being ferried by two pilots from Kitchener, Ontario, to the helicopter's owners in Calgary, Alberta. On the day of the occurrence, the helicopter departed Regina, Saskatchewan, at 1340 central standard time on a visual flight rules (VFR) flight plan for Medicine Hat, Alberta. The flight was crewed by two pilots. A licensed junior pilot was flying the aircraft from the right seat, while the company's chief pilot, who was acting as an instructor and was assisting with navigational duties, occupied the left seat. At approximately 1455, they encountered snow showers that greatly reduced visibility, at which time, the chief pilot assumed control of the helicopter. The visibility continued to worsen until the pilots encountered whiteout conditions and they lost all visual reference with the terrain. Shortly thereafter, the helicopter struck the snow-covered surface of a field four nautical miles southwest of the Swift Current, Saskatchewan, Airport. The aircraft was destroyed. The junior pilot sustained serious injuries, while the chief pilot suffered only minor injuries. The accident occurred during daylight hours at approximately 1500.

## *Other Factual Information*

The operator was approved for both Canadian Aviation Regulations (CARs) 702 (aerial work) and 703 (air taxi) operations. Most of the company's operation took place during the summer months with limited activity during the winter. Typically, they operated two or three helicopters and employed an equal number of pilots. The amount of work available for the leased helicopter, C-FIHL, had declined and the company decided to terminate the lease. The return of the aircraft had been delayed for several weeks due to poor weather conditions and maintenance requirements.

At the time of the occurrence, the junior pilot had approximately 200 hours total time, and had been employed by the company during the previous summer in a non-flying role. Typical of many entry-level aviation jobs, it was the company's policy to allow less-experienced company pilots to build up flight hours by having them fly company aircraft under supervision, on non-revenue flights without passengers. Eventually, the opportunity to fly full-time with the company might be offered, once the junior pilot accumulated enough flight time. The junior pilot maintained contact with the company after the summer flying season and was given the opportunity to build up his hours as pilot in command (PIC) during the ferry flight to Calgary.

The chief pilot had flown helicopters for over 30 years and had accumulated approximately 13 000 hours of helicopter flying time in a variety of geographic areas, with approximately 6000 hours on the Bell 206. The ferry flight to Calgary was an opportunity for the chief pilot to give some instruction and navigational assistance to the junior pilot. The chief pilot was a company training pilot who was qualified and approved to instruct from the left seat position. In his capacity as an instructor during the occurrence flight, the chief pilot would be expected to assume control of the aircraft in the event of an emergency.

Both pilots held valid Canadian commercial helicopter pilot licences, which were endorsed for the Bell 206 helicopter type. Available information indicated that, on the day of the accident, both pilots were adequately rested in accordance with company and Transport Canada requirements. Neither pilot was instrument rated and, as such, they were not authorized to operate a helicopter in instrument meteorological conditions (IMC). Both pilots had received pilot decision making training several years earlier.

On the day before the accident, the crew flew from Kitchener, Ontario, to Kenora. On the day of the accident, the pilots took off from Kenora at 0820 eastern standard time, stopped for fuel in Brandon, Manitoba, and then proceeded to Regina, Saskatchewan. During these two flights the pilots encountered light snow showers along the route. They did not anticipate that the weather for the Regina to Swift Current leg would prevent them from continuing their flight, as it was similar to the weather they had already encountered that same day.

Prior to departure from Regina, the junior pilot called Edmonton Flight Information Centre (FIC) and filed a visual flight rules (VFR) flight plan to Medicine Hat with an en route stop at Swift Current. The estimated time given for the Regina to Swift Current leg was one hour 30 minutes. The forecast weather for the flight called for intermittent ceilings between 400 and

3000 feet with flight visibilities of 4 to 10 miles in snow showers. The actual Swift Current weather for 1316 central standard time<sup>1</sup>, passed to the junior pilot by Edmonton FIC, was as follows:

wind 010° True (T) at 8 mph; visibility 1 mile; ceiling 100 feet overcast;  
temperature -6°C; dewpoint -6°C.

After liftoff from Regina, at approximately 1345, the junior pilot requested that Edmonton FIC open their flight plan and amend it to show that they would not be landing in Swift Current; it had been decided that there was ample fuel to reach Medicine Hat. Eliminating the stop would increase their chances of arriving in Calgary later that same day. This would allow the pilots to complete the required end-of-lease documentation before the close of business on Friday, which would preclude three days of leasing expenses and might have allowed them to be able to return home for the weekend. Both pilots reported that arriving in Calgary on Friday was not crucial to their plans and, if necessary, they would stop and wait for better weather. The helicopter could be landed in any suitable area if they encountered weather below VFR limits.

At 1449, the junior pilot contacted Edmonton FIC on the Swift Current mandatory frequency (MF) and advised that their position was 10 miles east of Swift Current at an altitude of 2800 feet above sea level (approximately 150 feet above ground level) and that they would like to pass overhead the Swift Current airfield en route to Medicine Hat. Edmonton FIC advised C-FIHL that the flight would have to stay outside the Swift Current control zone because the vertical visibility was 100 feet, the ground visibility was 1/4 mile, and the weather was below minima for VFR operations. The junior pilot acknowledged the weather and replied that they would deviate to the south of the control zone. At this point the crew had the option to divert around the poor weather or make a precautionary landing. The pilots later reported that the weather at their position was still suitable for VFR operations. The pilots had purportedly mistaken the actual reported station weather for the forecast weather and did not expect the weather in the Swift Current area to be as bad as that which they encountered.

Shortly after the pilots received the weather report, the visibility deteriorated, and the chief pilot assumed control of the aircraft. The weather continued to deteriorate, below VFR weather minimums, and the accident occurred seven or eight minutes later, when they encountered whiteout conditions.

Whiteout is a meteorological phenomenon in which a person is unable to discern clouds and horizon from the surrounding surface terrain features. Whiteout conditions occur when natural sunlight is diffused by clouds or other obscuring phenomena such as fog, snow, or ice crystals. Flight in reduced visibility greatly increases the workload of VFR pilots. Studies have shown that non-instrument rated pilots are likely to lose control of an aircraft within 3-7 minutes after entering IMC conditions.<sup>2</sup>

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<sup>1</sup> All times are central standard time (Coordinated Universal Time [UTC] minus six hours) unless otherwise noted.

<sup>2</sup> Reference Transport Canada publication TP 2228 E , *178 Seconds*

The pilots were using a global positioning system (GPS) in conjunction with topographical maps as a means of VFR navigation in areas of reduced visibility and featureless terrain along the route of flight.

Examination of the wreckage and surrounding area indicated that the damage to the main rotor and transmission mounts was consistent with a power-on, high-rpm impact with the ground. There was no information to suggest that any type of aircraft equipment malfunction occurred or that there were any pre-existing mechanical faults.

The *Canadian Aviation Regulations* for VFR flight are as follows:

Minimum Visual Meteorological Conditions for VFR Flight in Controlled Airspace

- 602.114 No person shall operate an aircraft in VFR flight within controlled airspace unless
- (a) the aircraft is operated with visual reference to the surface;
  - (b) flight visibility is not less than three miles;
  - (c) the distance of the aircraft from cloud is not less than 500 feet vertically and one mile horizontally; and
  - (d) where the aircraft is operated within a control zone,
    - (i) when reported, ground visibility is not less than three miles, and
    - (ii) except when taking off or landing, the distance of the aircraft from the surface is not less than 500 feet.

Minimum Visual Meteorological Conditions for VFR Flight in Uncontrolled Airspace

- 602.115 No person shall operate an aircraft in VFR flight within uncontrolled airspace unless
- (a) the aircraft is operated with visual reference to the surface;
  - (b) where the aircraft is operated at or above 1,000 feet AGL
    - (i) during the day, flight visibility is not less than one mile,
    - (ii) during the night, flight visibility is not less than three miles, and
    - (iii) in either case, the distance of the aircraft from cloud is not less than 500 feet vertically and 2,000 feet horizontally;
  - (c) Not relevant
  - (d) where the aircraft is a helicopter and is operated at less than 1,000 feet AGL
    - (i) during the day, flight visibility is not less than one mile, except if otherwise authorized in an air operator certificate or a flight training unit operator certificate - helicopter,
    - (ii) during the night, flight visibility is not less than three miles, and
    - (iii) in either case, the aircraft is operated clear of cloud.

## *Analysis*

The pilots of C-FIHL were operating in VFR weather conditions when they were advised of IMC in the Swift Current area. The chief pilot chose to continue rather than divert or make a precautionary landing, and his decision to proceed toward an area of IMC resulted in the crew's loss of visual reference and collision with terrain. After the decision to continue, the pilots passed a point where their actual weather conditions changed to IMC. The use of the GPS assisted the crew in navigating in the deteriorating conditions beyond the point at which they could safely fly the helicopter. As a result, they lost control and the helicopter struck the ground.

The fact that the pilots had earlier encountered and now anticipated less severe weather than was reported for Swift Current influenced the chief pilot's decision to proceed into IMC. Financial and personal considerations resulting from a late arrival in Calgary may have contributed to the pressure felt by the chief pilot to reach Calgary.

## *Findings as to Causes and Contributing Factors*

1. The chief pilot's decision to continue a visual flight into instrument meteorological conditions resulted in his inability to maintain control of the helicopter, and as a result, the helicopter was inadvertently flown into the snow-covered terrain.
2. The chief pilot's decision to continue into deteriorating weather conditions was influenced by a mistaken expectation that the weather at Swift Current was better than the reported conditions and the pressure to reach Calgary on the day of the occurrence.
3. The pilots disregarded the safe limits with regard to VFR flight, as described in Canadian Aviation Regulations.

## *Findings as to Risk*

1. The pilots' use of GPS assisted them in navigating into weather conditions in which they could not safely fly the helicopter.

*This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board authorized the release of this report on 22 December 2004.*

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