

AVIATION OCCURRENCE REPORT

COLLISION WITH TERRAIN

**NIAGARA HELICOPTERS LTD.
BELL 206L-3 LONGRANGER III (Helicopter) C-FLYO
MONTREAL INTERNATIONAL (MIRABEL) AIRPORT,
QUEBEC 20 mi SW
02 NOVEMBER 1995**

REPORT NUMBER A95Q0218

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.

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Summary

Two helicopters departed from Niagara Falls, Ontario, on a flight to the Bell Helicopter Textron factory at Mirabel, Quebec. At the start of the trip, the aircraft flew in formation in visual meteorological conditions. Helicopter C-FLYO, with the pilot and one passenger on board, followed the aircraft flown by the formation leader. En route, the weather deteriorated; the distance between the helicopters was reduced to 200 feet and the flight continued at low altitude and at a reduced speed. While in hovering flight above an electrical transmission line running across a highway, the C-FLYO pilot made a sudden manoeuvre to avoid a wire, then attempted to land. The helicopter touched down sideways and rolled over onto its right side. The pilot sustained minor injuries; the passenger was uninjured.

Ce rapport est également disponible en français.

Other Factual Information

By arrangement between the pilots, the two skid-equipped Bell 206L-3 helicopters departed Niagara Falls in formation flight. The formation leader, flying the lead helicopter, was in charge of radio communications and navigation. The helicopters stopped at Toronto, Ontario, where one passenger boarded each aircraft, and again at Kingston, Ontario, in order to refuel. The two helicopters took off from Kingston around 1321 eastern standard time for a flight to Bell Helicopter Textron in Mirabel.

The C-FLYO pilot was certified and qualified for the flight in accordance with existing regulations. He had been flying for the company for eight years. Previously, he had flown helicopters for the Philippine armed forces, where he gained his experience in formation flying. The pilot was responsible for the safety of the aircraft and the passengers on board. Accordingly, he had ultimate authority with respect to the operation of the aircraft during the flight. He reported to the chief pilot.

The formation leader was the company owner, who was also chief of operations and chief pilot. The chief of operations is responsible for ensuring that flights are conducted safely, in accordance with government laws and regulations, and in accordance with the standards, practices, procedures, and specifications prescribed in the company operations manual.

The two pilots obtained the meteorological information available on actual and forecast conditions along the route prior to the flight. The aerodrome forecast for the Mirabel and Dorval airports indicated a partially obscured sky condition with a ceiling of 300 feet above ground level (agl) and visibility of one mile in rain and haze. At the time of the accident, Mirabel reported a partially obscured sky condition with a ceiling of 300 feet agl, and visibility of one and one-half miles in light rain, light drizzle, and haze.

Along the way from Kingston to Mirabel, the meteorological conditions deteriorated. The flight continued at low altitude to about two thirds of the way where, with poor visibility in rain, the C-FLYO pilot landed in a field after losing sight of the formation leader. About 25 minutes later, the pilot of the lead helicopter located the second helicopter and landed beside it. The pilots discussed flight procedures for the remainder of the journey and agreed on the route to be followed to destination. They followed a railway, then a highway, in a northwesterly direction at altitudes between 700 and 100 feet agl.

A short time later, the helicopters, at 100 feet agl, crossed a lake 20 miles southwest of Bell Helicopter Textron. The radars stopped receiving the altitude of the lead helicopter when the formation leader switched off his transponder. The aircraft followed a highway to a point about two kilometres east of Saint-Eustache, Quebec, where three electrical transmission lines intersected the flight path. The first two lines were close together at a height of 120 feet; the third line, at a height of 270 feet, was 100 metres further east

and was obscured by low cloud. To continue the flight, the formation leader flew over the towers of the first two lines, then hovered to the left and descended before flying under the cables of the third line.

Wanting to maintain separation between the two helicopters, the C-FLYO pilot hovered above the first set of cables and watched as the lead helicopter manoeuvred between the power lines about 50 metres ahead of him. At that time, the passenger noticed that the aircraft was moving left and losing altitude. He promptly told the pilot that they were in danger of colliding with the wires. The pilot immediately backed up the helicopter, entered a right-hand turn, and descended for a landing. The aircraft touched down while it was moving sideways to the right. The helicopter bounced twice on the right skid, the main rotor blades sliced through a metal road sign, and the aircraft rolled over on its right side at the edge of the highway congested with rush-hour traffic. The accident occurred in uncontrolled airspace between the Mirabel and Dorval control zones.

A helicopter can fly in uncontrolled airspace when the visibility exceeds one-half mile, provided that it flies at a sufficiently reduced speed to allow the pilot to see obstacles in time to avoid them. When the weather is adverse and the pilot must fly at low altitude, he is required to comply with the Air Regulations. Section 534 provides that no person shall fly an aircraft over any open air assembly of persons at an altitude less than 1,000 feet above the highest obstacle within a radius of 2,000 feet from the aircraft or elsewhere than over the built-up area of any city, town, or other settlement or over any open air assembly of persons at an altitude of less than 500 feet above the highest obstacle within a radius of 500 feet from the aircraft.

Analysis

The pilots departed when the meteorological forecast gave reason to believe that, in order to reach their destination, the helicopters would have to fly in adverse weather conditions, at low altitude, and over an urban area traversed by electrical transmission lines.

As it is difficult to read a chart and identify obstacles and reference points when flying at low altitude, the formation led by the company owner had to follow a highway congested with rush-hour traffic. The fact that the formation leader was the company owner may have influenced the decision of the C-FLYO pilot to continue the flight in adverse weather conditions and to contravene the regulations.

Company management was responsible for controlling the operation of its aircraft and for ensuring that the pilots abided by existing regulations. However, for undetermined reasons, the lead pilot chose to guide the formation in adverse weather conditions at an altitude that compromised the safety of the aircraft and its occupants, and persons and property on the ground.

While in hovering flight above the first set of cables, the C-FLYO

pilot was using the lead helicopter as a visual reference to determine his position in relation to the ground. It was difficult to perceive changes in aircraft attitude because he was hovering high above ground, his field of view was reduced, and the visual reference was moving. The pilot appears to have inadvertently caused the helicopter to drift slightly and lose altitude. When the pilot realized that the aircraft was moving toward the wires, he made a sudden avoidance manoeuvre which culminated in the aircraft landing sideways and rolling over.

Findings

1. The pilot was certified and qualified for the flight in accordance with existing regulations.
2. The flight was initiated when the meteorological forecast indicated that, to arrive at their destination, the helicopters would have to fly in adverse weather.
3. The formation leader was the owner of the company, chief of operations, and chief pilot.
4. The formation followed a highway at low altitude, over an urban area.
5. The flight was conducted partially at an altitude lower than that prescribed by regulation.
6. The pilot hovered above an electrical transmission line, at a height where it was difficult to perceive changes in aircraft attitude.
7. The pilot lost control of the aircraft after making a sudden manoeuvre to avoid a wire.

Causes and Contributing Factors

While in hovering flight high above the ground, the pilot lost control of the aircraft after executing a manoeuvre to avoid colliding with a wire. Contributing to the accident were the pilot's decision to continue the flight in adverse weather conditions and the pilot's inadequate visual references while he was hovering above the electrical transmission line.

Safety Action Taken

Transport Canada is developing guidance material for the interpretation of Canadian Aviation Regulations 702 and 703 (Aerial Work and Air Taxi) which will include the suggestion that operators appoint dedicated Operations Managers and Chief Pilots, separate from the corporate or financial arm of the company.

Transport Canada will be reviewing the issue of formation flying through the Canadian Aviation Regulation Advisory Council (CARAC) with a view to establishing further regulatory parameters for this

activity. Additionally, hazards associated with formation flying will be the focus of a feature article in the Aviation Safety Newsletter Vortex.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board, consisting of Chairperson Benoît Bouchard, and members Maurice Harquail, Charles Simpson and W.A. Tadros, authorized the release of this report on 23 January 1997.