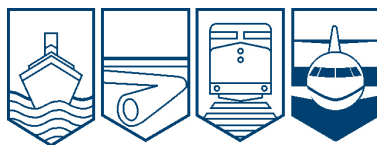


Transportation Safety Board  
of Canada



Bureau de la sécurité des transports  
du Canada

**AVIATION INVESTIGATION REPORT  
A10Q0148**



**LOSS OF VISUAL REFERENCE -  
COLLISION WITH TREES**

**CANADIAN HELICOPTERS LIMITED  
EUROCOPTER AS350 B-2 (HELICOPTER), C-GHVD  
CHIBOUGAMAU, QUEBEC 12 nm NW  
01 SEPTEMBER 2010**

**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

### Loss of Visual Reference - Collision with Trees

Canadian Helicopters Limited  
Eurocopter AS350 B-2 (Helicopter), C-GHVD  
Chibougamau, Quebec 12 nm NW  
01 September 2010

Report Number A10Q0148

### *Synopsis*

At 1529 Eastern Daylight Time, the Eurocopter AS350 B-2 (registration C-GHVD, serial number 1236), operated by Canadian Helicopters Limited, departed on the 85 nautical mile (nm) visual flight rules flight from a work site to the Hydro Quebec helicopter base near Chibougamau, Québec, with the pilot and 3 passengers on board. Approximately 20 nm northwest of the destination, the pilot deviated from the direct route to make a precautionary landing due to reduced visibility in heavy rain and thunderstorms. On final approach to land, and at approximately 70 feet above ground level, the pilot lost all visual reference. The aircraft collided with trees coming to rest on its left side. The pilot and the passenger seated in the front were seriously injured. The 2 passengers seated in the rear suffered minor injuries. The aircraft sustained substantial damage. There was no post-crash fire. The emergency locator transmitter activated on impact.

*Ce rapport est également disponible en français.*

## *Factual Information*

### *History of Flight*

Canadian Helicopters Limited (CHL) was contracted by Hydro-Québec (HQ) to transport workers involved in the repair of cement pylon foundations along several transmission lines located between Némiscau and Chibougamau, Quebec. The helicopter would normally depart the CHL base for the HQ helicopter base, located 2 nm from the CHL base and 10 nm east-northeast of the Chibougamau Airport (CYMT) thence to various work sites. Though the work would take several months to complete, it was on schedule and there were no pressing issues with the workday schedules or the contract as a whole.

On the morning of 01 September 2010, the pilot checked the weather on the internet at the company base, inspected the aircraft and prepared it for the visual flight rules (VFR) flight <sup>1</sup>. The pilot then flew to the HQ base to pick up 2 passengers; take-off was at 0707 <sup>2</sup>. Several sites were visited throughout the morning and the pilot returned to the CHL base at 1101 to refuel. The pilot then returned to the HQ base to pick up a third passenger. The helicopter took off from the HQ base at 1200 for various sites. All passengers had received pre-flight safety briefings pointing out important issues concerning the survival equipment, satellite phone, emergency locator transmitter (ELT) and first aid kit.

Visual meteorological conditions (VMC) <sup>3</sup> prevailed throughout most of the day. Heavy rain associated with a cold front that was heading in a southeasterly direction passed through the work site, 85 nm northwest of Chibougamau, sometime between 1430 and 1500. Although the work was completed, the pilot elected to remain on the ground and wait for the weather to improve. When the helicopter took off at 1529, the sky had cleared and the rain had stopped.

A portable satellite phone was available to the pilot at all times and could be used to call for weather information. As weather conditions were VMC at the work site, the pilot did not think it necessary to call for a weather update. The return flight to Chibougamau was expected to take approximately 50 minutes.

Using the on-board global positioning system (GPS), the pilot followed the direct route over mainly swampy, partially wooded, relatively flat land. Flying initially at 1000 feet above ground level, altitude and heading were relatively consistent throughout the flight until the pilot deviated south. The average ground speed along the route was 110 knots.

Between 40 and 20 nm from destination, the weather started to deteriorate. Visibility was reduced to approximately 2 to 3 miles in light rain. About 20 nm from destination, visibility decreased to approximately 1 mile in moderate rain.

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<sup>1</sup> Flight is conducted with visual reference to the ground or water.

<sup>2</sup> All times Eastern Daylight Time (Coordinated Universal Time minus 4 hours).

<sup>3</sup> The flight was conducted in uncontrolled airspace during day time. As per *Canadian Aviation Regulations* (CARs) 602.115, where the aircraft is a helicopter and is operated at less than 1000 feet above ground level (agl), flight visibility should not be less than one mile and the helicopter must remain clear of cloud.

As the visibility deteriorated, the pilot diverted south with the intention to land in a blueberry field beyond a gravel road and wait out the weather. The pilot knew of the gravel road but it had narrowed over time as brush had grown in and was not large enough in all areas to accommodate the rotor.

Visibility deteriorated further as the helicopter approached the gravel road on which the pilot then decided to land. On final approach, while approximately 70 feet agl at low airspeed over trees, the pilot lost all visual reference with the terrain due to heavy rain. While in a hover over the trees, the helicopter descended without the pilot realizing it and struck the trees then the ground, coming to rest on its left side, approximately 75 feet from the side of the road. There was no post-crash fire. The occurrence took place at 1606, 12 nm northwest of the intended destination.

### *Wreckage*

The descent into the trees was vertical with little or no forward speed. Upon colliding with the trees, the main rotor blades shattered and ripped from the hub. One of the 3 main rotor blades wrapped itself around the mast as the engine continued to drive the transmission. The engine showed signs of foreign object damage (FOD) from ingestion of dirt and vegetation.

The space within the cabin remained relatively intact. The front cabin nose area and windscreen collided with a grouping of trees, shattering the windscreen and nose cone windows. The rear floor area buckled upward in the area of the rear right outboard seat. The tail boom, vertical fin and tail rotor remained together as one piece, but separated at the tail boom junction frame, forward of the tail boom attachment point.

All seats remained anchored to their floor attachment points. The pilot and the passenger in the front left seat were wearing a four-point, inertia reel type safety belt. The pilot was wearing a helmet and sustained serious facial injuries. The front passenger sustained a fracture to the left shoulder. The passengers seated in the rear cabin were wearing a three-point safety belt and shoulder harness and sustained minor injuries. Occupants exited via the opening of the shattered windscreen.

### *Aircraft*

Records indicate that the helicopter was certified, equipped and maintained in accordance with existing regulations and approved procedures. The weight and center of gravity were within the prescribed limits and there was sufficient fuel to complete the flight. There were no technical difficulties noted with the aircraft prior to the event.

As with most lightweight helicopters, this helicopter was not equipped with windshield wipers; however, this option is available if desired by the operator. At higher airspeeds, precipitation will flow off the windshield more easily because of the increased airflow. The heavy precipitation encountered during the final approach would have accumulated on the windshield, restricting the pilot's visibility. Wipers are useful while operating at low speed in

moderate to heavy precipitation. Most operators will not equip light helicopters with wipers as they will scratch the polycarbonate windshield if not used under the ideal conditions and generally do not work well for most utility applications.

The aircraft was not equipped with a cockpit voice recorder (CVR) or a flight data recorder (FDR); neither is required by regulation.

### *The Pilot*

The pilot was certified and qualified for the flight in accordance with existing regulations. The pilot had accumulated approximately 3000 hours flight time as a commercial fixed-wing pilot, approximately 12 940 hours on helicopters of which approximately 10 230 hours were flown on AS350 type helicopters. Employed by CHL and based in Chibougamau since 1989, the pilot knew the area and terrain well.

### *ELT, Emergency Response and Flight Following*

The KANNAD 406 MHz ELT <sup>4</sup> functioned after impact and could be heard by overflying aircraft. The pilot placed the ELT remote control panel switch in the cockpit from the ARM to the ON position after the accident. The LED light on the switch was flashing, indicating the unit was working.

Passengers accessed the survival equipment by climbing on top of the helicopter to reach the right side cargo compartment area. The left side cargo compartment was inaccessible as the helicopter was lying on its left side. A passenger called the CHL base via satellite phone at 1615 to report the accident. The base manager was advised and called 911 and search and rescue. Later, the pilot called CHL to advise them of the situation and their location. CHL dispatched a helicopter which arrived at the site within 40 minutes of the occurrence. Meanwhile, passengers made their way to the road and flagged down a truck driver who remained on site until ambulances arrived at 1705. All occupants were transported to hospital.

Flight following is provided by HQ when a helicopter is contracted. The pilot forwarded a flight plan to the HQ flight follower prior to departure in the morning. The pilot also communicated with the flight follower via radio at every take-off and landing from each pylon site. Most of the flights were less than 30 minutes. The last position report made on the return flight was at 1552 with the next report expected at 1611. When the pilot had not made the expected position report, the flight follower called the CHL helicopter base at 1621.

### *Weather Information*

Pilots operating in the Chibougamau area will refer to the aviation routine weather report (METAR) and the aerodrome forecast (TAF) <sup>5</sup> for CYMT. However, since the CHL and HQ helicopter bases are outside the 5 nm TAF coverage, pilots will also refer to other forecast

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<sup>4</sup>

The KANNAD 406 MHz ELT also transmits on the 121.5 MHz and 243 MHz frequencies.

products such as the graphical area forecast (GFA) to obtain a broader weather picture. There are no TAFs issued for the Némiscau (CYHH) station; METARs however are available.

At the TSB's request, Environment Canada completed a weather study for the Chibougamau area for the day of the occurrence. At 1600, a line of thunderstorms was traversing the centre of Quebec, passing directly over Chibougamau. This line was associated with a cold front moving southeast at 10 knots. The thunderstorms were noticeable over a period of several hours on satellite imagery, the Canadian Lightning Detection Network (CLDN) and radar images. Due to the distance from the nearest weather radars, the Chibougamau area falls outside the coverage area of those radars and any thunderstorms within 40 statute miles (sm) of the Chibougamau airport would not appear on the weather radar imagery.

The following weather forecast information products were issued for 01 September 2010:

The GFA issued at 0131 covered a 12-hour period (from 0200 to 1400) in 6-hour snapshots forecast a possibility of thunderstorms for the Chibougamau area in the afternoon. The forecast weather was for broken cloud layers from 3000 feet above sea level (asl) to 18 000 feet asl, plus 6 sm visibility, isolated <sup>6</sup> altocumulus cloud to 24 000 feet asl, 3 sm visibility in light rain showers, mist. Isolated cumulonimbus cloud to 40 000 feet asl, 2 sm visibility in heavy thunderstorms, rain and mist, ceilings 400 feet agl (see Appendices A and B).

Normally there are no TAFs available for CYMT between 2000 and 0800. Therefore there was no valid TAF for CYMT at the time the pilot would have been flight planning early in the morning. The first TAF issued on 01 September 2010 for CYMT was at 0749 after the pilot had taken off and was valid from 0800 to 2000 for an area within 5 nm of the CYMT airport. This TAF did mention a temporary period of light rain showers between 1300 and 2000 and a ceiling at 3000 feet agl. No thunderstorms or heavy rain were forecast in this TAF, which was consistent with the mention of isolated thunderstorms in the GFA and the TAF content rules.

Upon returning to the CHL base at 1101 to refuel, the CHL base manager advised the pilot of the passage of the cold front forecast for approximately 1600. The pilot did not check the weather on the internet or call for a weather update or briefing at this point. The most current GFA remained unchanged from the one viewed in the morning before departing and the valid TAF for CYMT did not indicate thunderstorms. It is not known if a weather briefing would have given the pilot a better idea of the weather forecast or not. However a weather update would have been possible throughout the afternoon via satellite phone. The weather at the CHL base was VMC on departure for the work site at 1200.

The GFA issued at 1331 and valid at 1400 forecast the weather for the Chibougamau area to be overcast cloud layers from 3000 feet asl to 24 000 feet asl, with numerous ACC <sup>7</sup> to 24 000 feet asl, 5 to plus 6 sm visibility in light rain showers and patchy ceilings to 1200 feet agl, isolated

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<sup>5</sup> A METAR is an hourly weather observation taken at a specific aerodrome. A TAF gives a weather forecast for a 5 nm radius around a specific aerodrome.

<sup>6</sup> Isolated indicates less than 25% spatial coverage. Patchy indicates between 25% and 50% spatial coverage. Numerous indicates greater than 50% spatial coverage.

<sup>7</sup> Altocumulus Castellanus clouds.

cumulonimbus cloud to 40 000 feet asl, 2 sm in moderate thunderstorms and ceilings to 500 feet agl (see Appendix C). This area of weather had been on the GFA issued at 0131 but was now considerably further northeast and moving faster than previously forecast.

The TAF for CYMT issued at 1348 and valid for the time between 1400 and 2000 indicated plus 6 sm visibility, scattered cloud at 3000 feet, ceiling broken at 7000 feet. Temporarily from 1400 to 1600, plus 6 sm visibility in light rain showers, ceiling broken 3000 feet agl. From 1600 it indicated plus 6 sm visibility in light rain showers, scattered cloud at 2000 feet agl, ceiling broken at 4000 feet agl. Temporarily from 1600 to 1900 5 sm visibility in light rain showers and mist, ceiling broken cloud at 2000 feet agl. Again, no thunderstorms or heavy rain were forecast in this TAF which remained consistent with the isolated thunderstorms mentioned in the GFA issued just previously at 1331.

At 1454, an amendment to the CYMT TAF was issued, this time indicating that there was a 30% probability of thunderstorms between 1600 and 1900.

A new amendment to the CYMT TAF was issued at 1606, the time of the occurrence, indicating moderate thunderstorms, possibly giving 1 sm visibility in heavy rain and winds gusting up to 25 knots.

The METAR taken each hour for CYMT showed little change throughout the day from 0600 to 1500. The hourly report for 1600 and the special report issued at 1615 reported the following:

- METAR CYMT at 1600, wind from 220° T at 13 knots gusting 25 knots, visibility 12 sm, few clouds at 3000 feet, few clouds at 3500 feet towering cumulus, broken clouds 4000 feet cumulonimbus, temperature 28.5°C, dew point 18.8°C, altimeter setting 29.66 inches of mercury (in/Hg.).
- SPECI CYMT at 1615, winds from 280° T at 23 knots gusting 38 knots, visibility 5/8 of a sm in heavy thunderstorms and rain, clouds 4000 feet broken.

These reports demonstrate that in fifteen minutes time, visibility at the CYMT airport, 10 nm from occurrence site, decreased from 12 sm to 5/8 sm in heavy thunderstorms and rain. Although the aircraft could be flown above 1000 feet agl and clear of cloud, visibility decreased rapidly to less than 1 mile.

A significant meteorological report (SIGMET), intended to provide short-term warnings of certain potentially hazardous weather phenomena such as organized lines of thunderstorms, was issued at 1440 for the southwest area of Chibougamau. This SIGMET indicated that a 40 nm wide southwest to northeast line of thunderstorms was moving to the northeast from Matagami area at a speed of 25 knots. This displacement would have kept the thunderstorms well to the west of Chibougamau airport. The thunderstorms moved more quickly through the area than had been predicted by the SIGMET. SIGMETs are broadcast on the appropriate instrument flight rules (IFR) and VFR ATS frequencies upon receipt. An update to this SIGMET was issued

at 1610, 4 minutes after the occurrence and indicated a line of thunderstorms moving through the areas of Némiscau and Chibougamau. SIGMETs for scattered, unorganized thunderstorms are not issued.

A pilot report (PIREP) was issued for CYMT at 1530 indicating that there were two north-south lines of thunderstorms and rain with cumulonimbus cloud tops at 25 000 feet to 30 000 feet asl and building. Pilot weather reports pertain to current weather conditions encountered in flight. They are designed to provide other pilots, dispatchers and forecasters with current weather information. PIREPS are important to aviation meteorologists because they either confirm an existing forecast or indicate that an amendment to a forecast is necessary.

## *Decision Making*

Decision making is an ongoing process. It involves gathering information, processing that information, making a decision based on possible options, and then acting on that decision. This process is replayed over and over again as the flight progresses and information or cues gathered change and are reassessed. The decision to continue in poor weather is often based on perception of the situation, motivation and experience. <sup>8</sup>

The TSB investigation did not identify any overt pressure on the pilot to fly in adverse weather or complete the flight within a certain time frame on the day of the accident. Research into VFR-into-IMC occurrences has shown that VFR pilots can be overly optimistic on the probability of having to fly from VFR-into-IMC, and on their own abilities to fly out of IMC if encountered. Sometimes, a pilot's intimate knowledge of the local topography and operating area may encourage continued operation in deteriorating weather conditions. Research has also shown that pilots are motivated to complete their flights as planned, which brings on self-induced pressure. <sup>9</sup> The pilot was aware that the rain was intensifying as the aircraft approached its destination; however, the pilot was surprised by the suddenness in the decrease in visibility as it had been gradual over the last 20 to 30 nm. The helicopter was flown above 1000 feet agl and clear of cloud.

TSB data show that continued VFR flight into adverse weather represents a significant threat to aviation safety. While VFR into IMC accidents account for 10% of all reported accidents, 55% of those VFR into IMC accidents were fatal, compared to 10% of all other accidents.

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<sup>8</sup> Goh, J. and Wiegmann, D., "An Investigation of the Factors that contribute to Pilots' Decisions to Continue Visual Flight Rules Flight into Adverse Weather", in *the Proceedings of the 45th Annual Meeting of the Human Factors and Ergonomics Society*, 2001.

<sup>9</sup> J. Goh and D.A. Wiegmann, "Visual Flight Rules (VFR) Flight into Instrument meteorological Conditions (IMC); A Review of the Accident Data "In *Proceedings of the 11th International Symposium on Aviation Psychology*, 2011.



## *Operation Specifications*

Regulations specify that in uncontrolled airspace, helicopter day operations should not take place when visibility is less than 1 sm. <sup>10</sup> CHL has within its air operator certificate authorization to operate at no less than ½ sm visibility. <sup>11</sup> The pilot had completed all conditions by which an operator will allow a pilot to operate with visibility of no less than ½ sm, which includes pilot decision making training.

CHL experienced a fatal helicopter occurrence in July 2009 (TSB occurrence report A09Q0111). The investigation into the occurrence concluded that the pilot had flown in low visibility conditions, resulting in a collision with terrain. As safety action following the July 2009 occurrence, CHL issued a memorandum which was later incorporated into the Company Operations Manual. This memo addressed CHL weather policy for VFR operations, setting restrictions for VFR operations in low visibility conditions so as to mitigate the risk of an occurrence. The company memo outlined certain conditions to be respected;

- No flights shall depart a company base or an airport when reported weather conditions are below ceiling 600 feet and 3 miles visibility (weather equivalents are ceiling 700 feet and 2 miles visibility or ceiling 800 feet and 1 mile visibility).
- No new operations are to be started when the visibility is below 1 mile.
- Operations Specifications <sup>12</sup> which allow for flight in less than 1 mile visibility shall only be used to recover personnel to base, camp or for emergency flights approved by management.

This VFR occurrence flight undertaken and flown, with the objective to return personnel to base, was within the approved company procedures and Transport Canada Operations Specifications. Regulations also state that a pilot must maintain visual references with the ground while conducting a flight under VFR. <sup>13</sup>

## *Hydro-Québec*

HQ owns and privately operates 3 Dash 8 aircraft for transporting its employees and contract workers to and from various work locations throughout the province. On average, HQ completes 3600 hours total flight time on fixed-wing aircraft, carrying 60 000 passengers per year. HQ Air Transport Unit takes care of aircraft contract needs, flight following, operator maintenance audits and flight safety.

Work needing the use of helicopters is contracted out to various Quebec helicopter operators. HQ flight operations statistics for the period from 1992 to 2010 show a total of 299 000 hours of helicopter flight time, with an average of 15 736.8 hours of helicopter flight time per year.

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<sup>10</sup> Canadian Aviation Regulations (CARs) 602.115 (d)

<sup>11</sup> CARs 703.28 - Ops Spec 005

<sup>12</sup> CARs Standard 723.28

<sup>13</sup> CARs 602.115

The following TSB laboratory report was completed:

LP 131/2010 – GPS & SkyTrac Downloads

This report is available from the Transportation Safety Board of Canada upon request.

## *Analysis*

As no TAF for CYMT was available when the pilot was flight planning early in the morning, the GFA was consulted. The GFA available to the pilot at the time of planning did mention the probability of isolated cumulonimbus clouds with tops to 40 000 feet asl, 2 sm visibility in thunderstorms, rain and mist. The pilot was aware that the cold front was expected to move through the Chibougamau area around 1600.

Except for the line of thunderstorms that passed through the worksite at approximately 1430, visual meteorological conditions prevailed throughout most of the day between Chibougamau and the work site. The pilot did not feel it necessary to obtain a weather update during the day though there were opportunities to do so: at the time of refueling at 1101 or anytime using the satellite telephone. Obtaining a weather update before departing or while en route for the return flight at 1530 would have made the pilot aware of the SIGMET issued at 1440 indicating the presence of thunderstorms in the Chibougamau area.

The pilot delayed departure from the work site until approximately 30 minutes after the passage of the thunderstorms and associated heavy rain. The speed of the helicopter, however, allowed it to catch up with the front between 40 and 20 nm from destination, where the visibility started to decrease, first in light rain, then in moderate rain and, finally, in heavy rain.

When the visibility decreased to approximately 1 mile in moderate rain, the pilot elected to deviate from the direct GPS route toward a blueberry field to execute a precautionary landing and wait for better conditions. At no time prior to this did the pilot think it necessary to change course and fly out of the line of thunderstorms. The pilot knew the terrain well and, therefore, at that point in the flight, did not perceive any risk in continuing. When the visibility decreased further in heavy rain, the pilot was compelled to land immediately on the gravel road. The pilot was aware that the rain was intensifying as the aircraft approached its destination; however, the pilot was surprised by the suddenness of the decrease in visibility as the decrease in visibility had been gradual over the last 20 to 30 nm and the cloud ceiling had remained VMC. Visual reference with the ground and trees was lost while manoeuvring at low speed, on final approach to the road. While in a hover, over the trees, 75 feet from the road side, the helicopter descended vertically without the pilot realizing it, and struck the trees and then the ground. The helicopter was not equipped with windshield wipers which may have been useful in this phase of flight and weather conditions encountered. The decision to deviate out of the weather and land was taken too late.

Some aviation weather forecast products mentioned the thunderstorms in the Chibougamau area but did not specify their location and displacement. This is noticeable in the lack of information on the probability of thunderstorms in the CYMT TAF of 1400 and on the

displacement of the line of thunderstorms in the SIGMET issued at 1440. Notwithstanding, the line of thunderstorms associated with the passage of the cold front was noticeable over a period of several hours on the satellite imagery, CLDN and weather radar images. Chibougamau area falls outside the coverage area of those radars and any thunderstorms within 40 sm of the Chibougamau airport would not appear on the weather radar imagery.

Although injuries sustained by the 2 front occupants were serious, they were not life threatening. Rapid rescue response is essential to survivability, especially when occupants are injured. The safety briefings received by passengers prior to flying was useful in providing them with essential information on the ELT, survival equipment, satellite phone and first aid kit. The passengers' ability to quickly communicate with CHL allowed both the company and first responders to react rapidly; a company helicopter was on site within 40 minutes of the occurrence and 2 ambulances were on site within an hour.

### *Findings as to Causes and Contributing Factors*

1. Although the pilot was aware of the passage of a cold front forecast for the time of the return flight, a weather update was not obtained as weather at the work site was visual meteorological conditions throughout most of the day.
2. The pilot had not anticipated catching up with the line of thunderstorms which had previously passed over the worksite. The decision to deviate and/or land prior to encountering conditions of reduced visibility in heavy rain was made too late.
3. While attempting to execute a landing on a gravel road to wait for the weather to improve, the pilot lost all visual references in conditions of reduced visibility in heavy rain; consequently, the helicopter collided with the trees and ground.

### *Other Finding*

1. The pre-flight safety briefings received by the passengers allowed them to quickly communicate their situation and location to the company and first responders. They made use of the survival equipment, satellite phone and first aid kit. The pilot was able to ensure the emergency locator transmitter was ON. Rapid response is crucial to survivability.

### *Safety Action Taken*

#### *Hydro-Québec*

1. Following this occurrence and another fatal occurrence (TSB A10Q0132) involving HQ employees and flight in poor weather, HQ's flight safety department conducted a risk assessment of its overall flight operations. The review of its occurrence data

highlighted 4 main safety concerns in its contracted helicopter flight operations. These are:

- Flight in poor weather;
  - Flight within the Height - Velocity curve;
  - Take-offs in overweight configuration; and
  - Operating at less than 11 meters from structures
2. HQ has organized information sessions at various HQ locations in order to address the 4 concerns raised during its risk assessment exercise. These concerns will be addressed with contract helicopter operators as well as HQ users (employees). The objective is not only to discuss HQ's concerns but also to educate the users by emphasizing their role as passengers and how they may negatively or positively influence the safe outcome of a flight. The first information sessions were held the 21 April 2011 and the 13 July 2011. More sessions will be organized in the future.

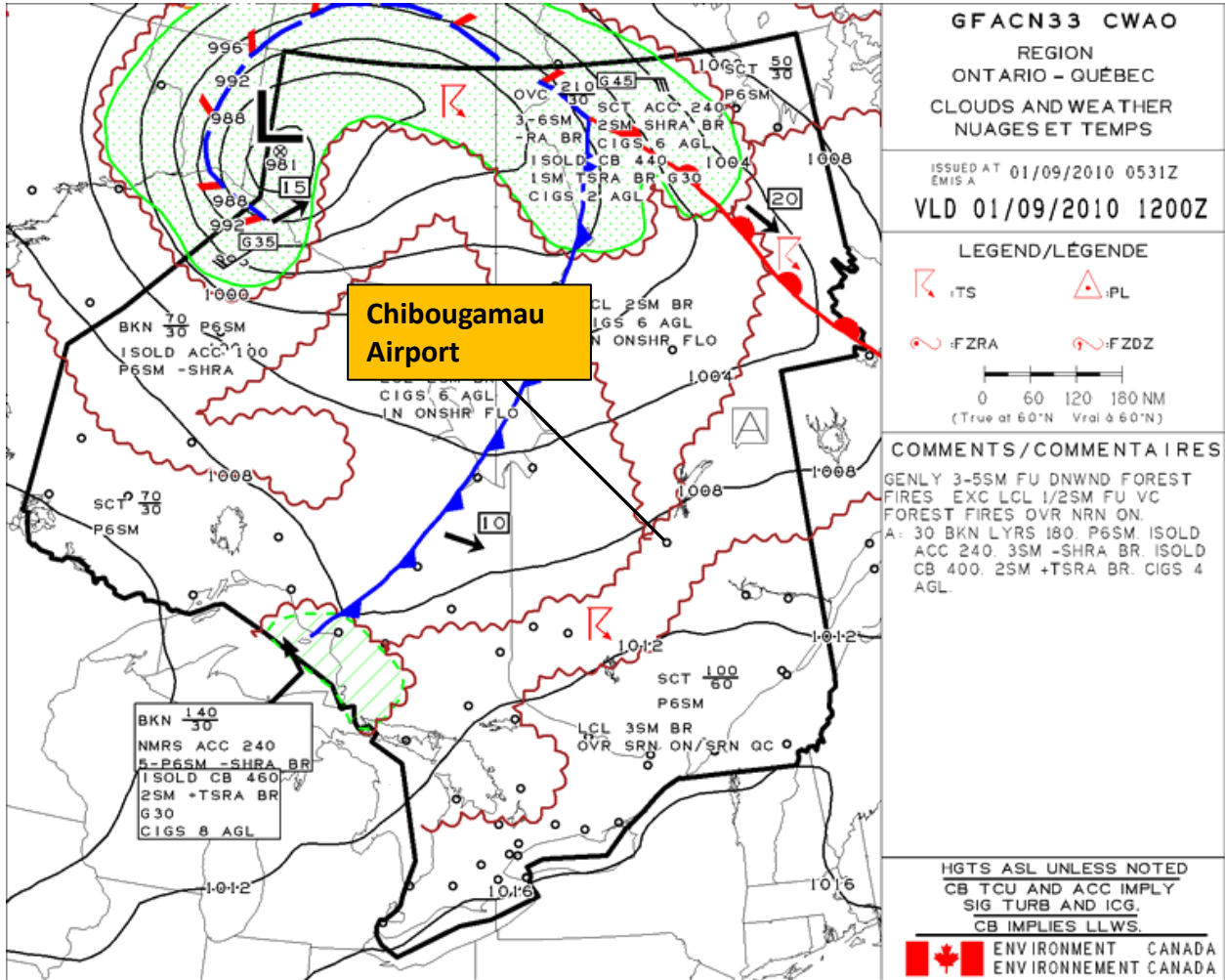
### *Canadian Helicopters Limited*

1. CHL has modified the content of the annual pilot training syllabus in order to address safety with regard to Pilot Decision Making training and Inadvertent IMC/Low Visibility training.

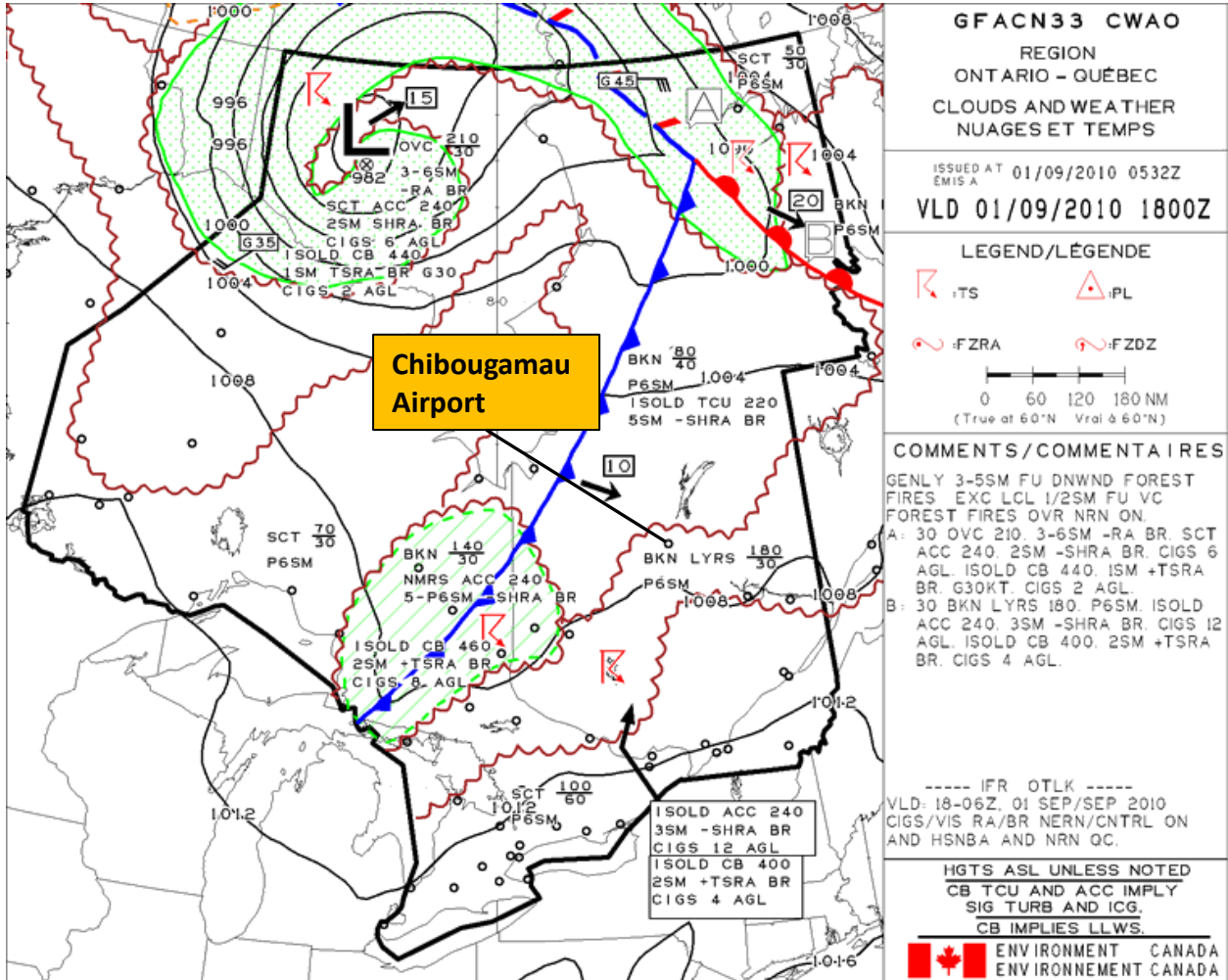
*This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board authorized the release of this report on 12 December 2011.*

*Visit the Transportation Safety Board's website ([www.bst-tsb.gc.ca](http://www.bst-tsb.gc.ca)) for information about the Transportation Safety Board and its products and services. There you will also find links to other safety organizations and related sites.*

*Appendix A – Graphical Area Forecast (GFA), issued  
01 September 2010 at 0531Z (0131 EDT), valid at 1200Z  
(0800 EDT)*



Appendix B – Graphical Area Forecast (GFA), issued  
 01 September 2010 at 0532Z (0132 EDT), valid at 1800Z  
 (1400 EDT)



Appendix C- Graphical Area Forecast (GFA), issued  
01 September 2010 at 1715Z (1351 EDT), valid at 1800Z  
(1400 EDT)

