

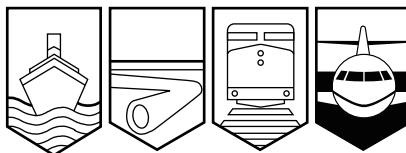
Transportation Safety Board
of Canada



Bureau de la sécurité des transports
du Canada

AVIATION INVESTIGATION REPORT

A00P0107



COLLISION WITH TERRAIN

TRANS NORTH TURBO AIR LIMITED
BELL 206L-3 LONGRANGER (HELICOPTER) C-FJAL
LLEWELLYN GLACIER, BRITISH COLUMBIA
22 JUNE 2000

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

Collision with Terrain

Trans North Turbo Air Limited
Bell 206L-3 Longranger (Helicopter) C-FJAL
Llewellyn Glacier, British Columbia
22 June 2000

Report Number A00P0107

Summary

The pilot of a Bell 206L-3 Longranger helicopter, serial number 45295, was conducting filming operations at the Llewellyn Glacier for a television commercial depicting extreme sports. The helicopter, equipped with a nose-mounted camera, was occupied by the pilot, the film director, and two camera persons. At about 1715 Pacific daylight time, the helicopter was flying at a high speed in a crevasse among seracs on the glacier when its main rotor struck a serac. The main rotor broke, and the helicopter careened into the ice wall of a perpendicular crevasse, broke apart, caught fire, and tumbled into the crevasse. The impact forces were not survivable, and the remains of the main fuselage area were not recognizable. Rescue and recovery personnel determined that there were no survivors and that recovery would present high risk to personnel. There was no recovery.

Ce rapport est également disponible en français.

Other Factual Information

The area of northern British Columbia (B.C.) where the accident occurred was experiencing a high-pressure weather system. The sky was clear, and the wind was light to moderate.

The helicopter was employed for filming to make a television commercial depicting extreme outdoor sports.

The accident pilot had flown in the area for many years and was the chief pilot for Trans North Turbo Air Limited and had flown 8.7 hours in June, most of which was in the accident helicopter. He had no apparent abnormal personal stresses and was happy to do the job. He had experience in many helicopter operations, including operations for the local film industry. The pilot who had done the flying for the earlier film shoots, recognized by the international film industry as a film pilot, was in the area to complete the filming. However, complications with equipment and training presented additional cost and some uncertainty with regard to timing, so the accident pilot and helicopter were chosen for this film shoot.

At about 0730 Pacific daylight time,¹ the pilot departed Whitehorse, Yukon, flew to Atlin, B.C., and from there he flew to the Llewellyn Glacier staging area. Other filming and preparatory work were being completed before aerial filming began at about 1640. The helicopter took off with the pilot, the film director, and two camera persons on board. An ice climber was dropped off on a serac by another helicopter and was to be filmed by the nose-mounted camera on the accident helicopter.² The film director was seated in the front, left seat next to the pilot, with the camera controls in front of him. A few passes were made over the ice climber at a height of about 50 feet. The helicopter then landed, and the camera lens was changed to a 10-millimetre, wide-angle lens. This lens allowed the camera to capture the surrounding scenery but required that the helicopter fly close to the terrain and actor. On a filming fly-pass just before the accident, the actor/ice climber complained that the helicopter was uncomfortably close, about five feet over his head, at a high speed.

The accident fly-pass was intended as a set-up pass for the camera. The actor was looking at the helicopter, coming at him this time from a different heading. It was flying below the serac tops, in the crevasses, at a high speed. The main rotor struck a serac about 100 metres away from the serac on which the actor was standing. One of the main rotor blades broke, and the helicopter careened into the ice wall of a perpendicular crevasse about 50 metres from the initial blade impact. The helicopter broke apart explosively, caught fire, and tumbled into the crevasse below. Debris, mostly ice, showered the actor, but he was not injured.

Within minutes another helicopter arrived at the accident site. It was evident that no one had survived the impact. The next day recovery personnel determined that recovery would present

¹ All times are Pacific daylight time (Coordinated Universal Time minus seven hours).

² Seracs are castle-like masses into which a glacier is divided at steep points by crossing crevasses.

high risk to personnel. The ice in the crevasse was shifting continually, there were few identifiable pieces of the helicopter, and remains of the main fuselage area were not recognizable. Therefore, there was no recovery.

Investigators surveyed the site from the air. The mark on the serac, where the main rotor first made contact, was consistent with what would be expected by an advancing main rotor blade, in level flight, at a constant speed or accelerating. The marks made by the helicopter in the ice wall, two seracs farther along the flight path, demonstrated features of a main rotor blade bending abnormally. These marks were at a height not much lower than the first contact mark. The disabled helicopter flew over a serac between the two marks. In the crevasse below the second impact mark there were a few engine cowling pieces, the engine, which appeared to be intact, the tail-rotor, and some tail section and skid gear pieces. The main rotor assembly was attached to the mast, but it was apart from the main transmission. What appeared to be a full-length main rotor blade was stabbed into the ice. The opposing blade, except for about two feet from the grip, was missing.

A number of pilots specialize in aerial filming and recognize that pilots can get caught up in the filming and be pressured, or pressure themselves, to operate with little or no room for error. Pilots often become consumed by the work objective when they are conducting aerial work; operating the helicopter can become secondary. As an example, when a pilot is flying in a narrow valley, his or her effective awareness is about 100 degrees on either side of the nose; however, when trying to keep a nose-mounted camera focussed on an object in the valley, the pilot's effective awareness is concentrated about 45 degrees on either side of the nose. Aerial filming pilots are often asked to juggle the creative and technical aspects of filming with the creative and technical aspects of flying. They are often asked to do things that are unconventional in flying to achieve certain images. Pilots with knowledge of filming techniques can reduce risk by flying slowly. When filming from a helicopter, the effect of speed can be created by adjusting camera filming speed.

Analysis

By focussing on the image in front of him and flying close to the seracs at a high speed, the pilot likely was unable to identify the impending serac, assess its proximity, and alter the helicopter's course in time to avoid it.

Based on the height and angle of the mark left on the serac by the main rotor and the height of the mark left by the helicopter when it collided with the ice wall, which were at relatively the same height, it is concluded that the helicopter was in powered flight when its main rotor first hit the serac. When the blade broke, the main rotor system would have become severely out of balance, and control would have been lost. Even with power, the pilot would not have been able to manoeuvre the helicopter to avoid the ice terrain ahead.

Findings as to Causes and Contributing Factors

1. The pilot was operating the helicopter at a height and speed that left no room for error in dimensional judgement.
2. The pilot lost control of the helicopter when the main rotor struck the ice and broke.

Other Findings

1. The pilot was certificated within the standards set for aerial work operations.
2. No mechanical malfunction was reported on the aircraft, nor was anything learned during the investigation that would suggest mechanical malfunction.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board authorized the release of this report on 4 January 2001.