AVIATION OCCURRENCE REPORT

COLLISION WITH PERSON

VIKING HELICOPTERS LTD.
AS350 BA (Helicopter) C-GDLY
SEPT-ÎLES, QUEBEC 160 nm NW
12 DECEMBER 1995

REPORT NUMBER A95Q0236

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

The helicopter, an Astar AS350 BA, registration C-GDLY, was engaged in aerial work and transporting passengers from the Gabriel relay to a generator site located about a 20-minute flight away, 160 nautical miles (nm) north of Sept-Îles, Quebec. The site was just off the Kay Subdivision of the railway owned by the Cartier Railway Company and leading from Port-Cartier to Fermont. The aircraft was carrying two passengers and hand luggage in addition to the pilot. Shortly after the aircraft landed on sloping ground, the passenger sitting on the right, behind the pilot, left the aircraft to go to a shelter located on the left side. As the passenger was proceeding towards the front of the helicopter, the main rotor touched his head. The passenger was taken immediately to the Sept-Îles hospital where he was declared dead.

The occurrence took place in daylight under visual meteorological conditions.

Ce rapport est également disponible en français.

Other Factual Information

The pilot was licensed and qualified for the flight according to current regulations. He underwent his last annual proficiency test on 24 January 1994 with a check pilot. The pilot had accumulated 7,750 hours on helicopters over a period of 20 years in the industry. The aircraft was certified, equipped, and maintained in accordance with existing regulations and approved procedures. The helicopter was configured with high skids and Airglass skis.

The weather conditions, as reported by the pilot, were a ceiling of 3,000 feet with visibility of five miles; temperature -28°C; and winds from the west at 20 knots.

The occurrence flight was the fourth trip the pilot had made that day to the same location. The pilot slung cargo on the first two trips, and had two passengers with hand baggage on board during the last two. On the first of the two passenger flights, the pilot set the helicopter down in front of the generator shack, with the aircraft's longitudinal axis on the alignment of a small road with an upslope of 8.5 degrees, covered with six to eight inches of snow. The passengers left the aircraft, one by the left door, on the opposite side from the pilot, and the other by the right door. The latter passenger walked round the aircraft to the front and then proceeded 90 degrees to the left of the aircraft towards the generator shack, as recommended by the pilot before the flight.

The pilot then returned to the Gabriel relay to refuel and pick up two other passengers. On the ground, prior to departure, he noticed that one of the passengers seemed to be more apprehensive and disoriented around the helicopter than the other. The pilot therefore gave them a second safety briefing in which he stressed the procedures to be followed on boarding and disembarking, including lowering the head, not passing behind the aircraft, and remaining in view of the pilot.

On boarding the aircraft, the apprehensive passenger decided to sit behind the pilot, saying that he felt better if he did not see in front. The flight duration was 20 minutes. At destination, the pilot set the aircraft down in the tracks of the previous landing, lowered the collective, and advised passengers that they could exit the helicopter. The passenger sitting in the left front seat got out and proceeded to the shack. The passenger sitting behind the pilot left the aircraft and walked towards the front, as had the other passenger before him, following more or less in the same tracks.

Meanwhile, the pilot had lowered full down the collective pitch control, centred the cyclic and was preparing to shift to the ground idle detent when he heard a thud which seemed to come from the rear of the aircraft. At that time, the departing passenger was about 30 degrees to the right of the aircraft's longitudinal axis, coming round to the front, as suggested in the briefing. The pilot then turned his head back and felt the aircraft tilt back. To get out of that position, the pilot pulled on the collective pitch and pushed on the cyclic pitch control.

The aircraft left the ground, but the pilot had trouble controlling it. The pilot then noticed someone caught on the tip of the HF antenna, without, however, realizing what was happening. The aircraft was in an excessively nose-down attitude, and it was only when the HF antenna, which projects in front of the aircraft, broke that the pilot actually regained control of the aircraft. The HF antenna projects in front of the aircraft to a distance approximately one foot less than the main rotor diameter.

The pilot set the aircraft down. He then noticed that someone was lying on the ground and had been hit by the main rotor about 10 inches from the tip. Nobody had seen what had happened. The pilot, assisted by the passengers, administered first aid to the victim before transporting him to the hospital by helicopter. He was declared dead on arrival.

Eurocopter mentioned that, when the helicopter is at full rotor rpm, the clearance between the ground and the tip path plane may be between ten and eight feet when the cyclic control is being moved from neutral to full forward. The AS350 flight manual states that the nose-up attitude of the aircraft should not exceed 10 degrees when the aircraft is resting on the ground; the purpose of this requirement is to avoid tilting backwards. Because the skids are aligned with the direction of the slope, the requirement also serves to decrease the possibility of slipping. It is hard to judge the distance between the ground and the main rotor because it is a function of, among other things, the slope and the position of the cyclic pitch control.

According to TSB statistics, helicopter flying hours in Canada have averaged 433,000 hours per year over the past 10 years. During those 10 years, there have been six deaths due to either a main rotor or a tail rotor strike, making for one fatal accident of this kind about every 720,000 flying hours. Figures are not available, however, for the number of passengers carried and the number of times they entered or left the aircraft during those flying hours.

Analysis

The aircraft was maintained in accordance with existing regulations. The pilot was qualified for the flight.

It is common practice for helicopter pilots to take on and drop off passengers with the rotor running after an appropriate briefing has been given, as set out in Air Navigation Orders (ANO) Series VII. The practice is widespread in the industry and is accepted by both companies and passengers even though it involves some risk. To further decrease the risk on this occasion, the pilot had given this group of passengers a second briefing.

Shortly after the pilot's attention was attracted by a noise behind him, he felt the aircraft tilt. He acted by reflex to try to regain control of the aircraft and thus prevent it from tipping over. At all stages of training, instructors stress that the pilot must react quickly and effectively when the aircraft tilts in one direction or the other. In general, helicopters do not tolerate strong tilts. They result in a static or dynamic rollover, often with serious consequences. Slipping backwards could be perceived in the same way and cause the same reactions.

When the last passenger to disembark passed in front of the aircraft, he was struck by the main rotor. Since nobody saw what happened, it is difficult to determine whether the passenger was hit solely because of the slope, the slip or the tilt, or whether he did not follow the safety precautions given by the pilot. It is just as likely that the accident was caused by a combination of these events.

Findings

1. The pilot was qualified on the aircraft.

2. All the passengers received a safety briefing.

3. The landing ground sloped up at a grade of 8.5 degrees.

4. The flight manual for the aircraft specifies that the maximum slope for landing and stopping the aircraft is 10 degrees in a nose-up attitude.

5. Other passengers were disembarked at the same place earlier.

6. On the ground, the pilot felt the aircraft tilt back and immediately regained control of it.

7. The last passenger to exit the aircraft was hit on the head by the main rotor.

8. Disembarking passengers while the aircraft is running is a common practice accepted by the industry and the authorities, but involves some risk.

Causes and Contributing Factors

One of the passengers was hit by the main rotor while passing in front of the aircraft; it was impossible, however, to determine the exact moment and circumstances of the occurrence.

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 19 March 1997.