



TSB Recommendation A24-01

Recovery from inadvertent flight into instrument meteorological conditions

The Transportation Safety Board of Canada recommends that the Department of Transport require commercial helicopter operators to ensure pilots possess the skills necessary to recover from inadvertent flight into instrument meteorological conditions.

Air transportation safety investigation report	A21C0038
Date the recommendation was issued	15 February 2024
Date of the latest response	May 2024
Date of the latest assessment	August 2024
Rating of the latest response	Satisfactory Intent
File status	Active

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Summary of the occurrence

At approximately 1548 Central Daylight Time on 25 April 2021, the Great Slave Helicopters 2018 Ltd. Airbus Helicopters AS350 B2 (registration C-FYDA, serial number 4157) departed from a remote camp on Russell Island, Nunavut, on a day visual flight rules (VFR) flight to Resolute Bay Airport, Nunavut, located 87 nautical miles to the northeast. On board were the pilot, an aircraft maintenance engineer, and a biologist. The purpose of the flight was to return to Resolute Bay following 12 days spent conducting polar bear research for a client, given that poor weather was forecast in the area for the next several days.

At approximately 1633 Central Daylight Time, the helicopter impacted the snow-covered terrain on Griffith Island, Nunavut, approximately 12 nautical miles southwest of Resolute Bay Airport, on a near-reciprocal track to the intended route. The helicopter was destroyed, and a post-impact fire consumed much of the fuselage area. The emergency locator transmitter was

destroyed during the impact sequence and did not transmit a distress signal. There were no survivors.

In addition to the circumstances that most likely led to the collision with terrain resulting from a loss of visual references in flat light and whiteout conditions, the investigation examined the factors that likely influenced the pilot's decision-making process, the organizational defences in place at Great Slave Helicopters 2018 Ltd., and the regulatory environment.

The Board concluded its investigation and released report A21C0038 on 15 February 2024.

Rationale for the recommendation

Despite the prevalence of loss of visual reference accidents involving visual flight rules (VFR) helicopter operations, and even though some VFR helicopter pilots are authorized to fly in visibility as low as ½ statute mile, there is no requirement for Canadian commercial helicopter operators to ensure that company pilots possess the skills necessary to recover from inadvertent flight into instrument meteorological conditions (IIMC).

During this investigation, the TSB discovered that some Canadian commercial helicopter operators with pilots who possess instrument flight rules (IFR) flight experience place considerable importance on equipping their aircraft and training their VFR pilots for IIMC recovery when operating above the tree line during the winter months. However, other companies that only conduct VFR operations, including Great Slave Helicopters 2018 Ltd. (GSH), have adopted and rely on an “avoid-at-all-costs” approach to IIMC. This approach, which is permitted under *the Canadian Aviation Regulations* (CARs), relies on a pilot's ability to avoid IIMC and to fly solely by reference to outside visual cues.

As seen in this occurrence, and many others highlighted in Air transportation safety investigation report A21C0038,¹ it may be ineffective to rely on an approach predicated on intentionally avoiding something that is unintended. Given the number of IIMC accidents that have occurred, and that helicopter accidents are more than twice as likely to involve a loss of visual reference than are airplane accidents, it is apparent that the “avoid-at-all-costs” approach to IIMC is not effective when used in isolation. The reliance on this approach can place pilots and passengers at increased risk of IIMC accidents because that approach typically encourages pilots to fly lower and slower as the weather deteriorates until they determine it is no longer safe to do so. This approach typically puts helicopters at close proximity to the ground in a flight profile that could make it harder, if not impossible, to transition to flight instruments if visual references are lost.

¹ See Air Transportation Safety Investigation Report A21C0038, sections 1.18.8.2 *Previous investigations*, 1.18.8.3 *Australian Transport Safety Bureau Investigation AO-2013-216*, and 1.18.9 *TSB statistics on loss of visual reference accidents*, and Appendix F *TSB investigations involving loss of spatial awareness during commercial helicopter flights*.

When the occurrence pilot recognized the need to take evasive action, he lacked the skills necessary to safely transition to instrument flight and carry out a pre-determined IIMC recovery procedure, such as climbing straight ahead or conducting a 180° turn to return to visual meteorological conditions, before all external references were lost. Instead, the occurrence pilot most likely relied on the technique he was trained to use, which was to continue flying by reference to outside references, until inadequate visual cues existed. This technique resulted in the occurrence helicopter inadvertently impacting the terrain when the pilot likely encountered IMC due to flat light and whiteout conditions.

Following a series of flat light and whiteout condition accidents involving commercial VFR helicopters in the United States (U.S.), the U.S. National Transportation Safety Board issued several safety recommendations in 2002 aimed at reducing these types of occurrences. As a result of these recommendations, the U.S. Federal Aviation Administration made changes to the *Federal Aviation Regulations*. One of the most notable changes was an initial and recurrent requirement for commercial helicopter pilots to demonstrate that they possess the skills necessary to recover from an IIMC encounter.² The Helicopter Association International has also recognized the need for action and has developed a comprehensive approach to IIMC that includes training on both avoidance of, and recovery from, IIMC situations. This approach is endorsed by the United States Helicopter Safety Team and the Helicopter Association of Canada.

In Canada, the flight test to obtain the private and then the commercial helicopter licence requires that pilots demonstrate several skills such as hovering, steep turns, and autorotations. Additionally, a pilot must demonstrate the ability to maintain control by reference to flight instruments during simulated IIMC.³ This shows that helicopter pilots with limited instrument flying experience can be trained to carry out an IIMC recovery procedure solely by reference to flight instruments.

Once pilots obtain their commercial licence, several of these flight test requirements (e.g., autorotations) must be demonstrated during annual pilot proficiency checks. However, despite the number of helicopter IIMC accidents and associated fatalities, there is no requirement for commercial VFR helicopter pilots to demonstrate during pilot proficiency checks that they retain the skills necessary to recover from IIMC. Since there is no requirement to maintain this skill set, there is no requirement for commercial VFR helicopter operators to provide their pilots with IIMC recovery training. Without recurrent training, either in the aircraft or through other means, skill erosion will occur. The more time that has elapsed since pilots were last tested on the ability to recover from IIMC, the less likely they will have both the skill and

² Federal Aviation Administration (FAA), *Code of Federal Regulations*, Title 14, Part 135, paragraph 135.293.

³ Transport Canada, TP 3077, *Flight Test Guide – Private and Commercial Pilot Licence (Helicopter)*, Third Edition (February 2013), Item Ex. 30 – Instrument Flying.

confidence to carry out such a manoeuvre under real-life conditions.^{4,5} Therefore, the current regulations allow VFR helicopter pilots to operate in environmental conditions conducive to a loss of visual references, without any assurances that they possess the skills necessary to recover from an IIMC encounter.

In 1990, the TSB issued Recommendation A90-81 calling for Transport Canada (TC) to require verification of proficiency in basic instrument flying skills for commercially employed helicopter pilots during annual pilot proficiency flight checks. After a lack of action by TC over several years, the Board considered TC's response to this recommendation to be **Unsatisfactory** and changed the recommendation status to dormant.⁶

Because there is no requirement for commercial helicopter operators to ensure that pilots possess the skills necessary to recover from IIMC, the pilots and passengers who travel on VFR helicopters are at increased risk of collision with terrain following a loss of visual references.

Therefore, the Board recommended that

The Department of Transport require commercial helicopter operators to ensure pilots possess the skills necessary to recover from inadvertent flight into instrument meteorological conditions.

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Previous responses and assessments

N/A

Latest response and assessment

May 2024: response from Transport Canada

Transport Canada (TC) agrees in principle with the Transportation Safety Board (TSB)'s recommendation. We recognize the importance of equipping pilots with the proficiency required to handle and effectively recover from inadvertent flight into instrument meteorological conditions (IIMC), increasing the odds of survival in such conditions.

TC will take the time to study the regulatory requirements that the Federal Aviation Administration (FAA) has implemented for initial and recurrent demonstration of skills to

⁴ TSB Aviation Safety Study 90-SP002, *Report of a Safety Study on VFR flight into adverse weather* (13 November 1990).

⁵ Australian Transport Safety Bureau, AR-2012-122, *Avoidable Accidents No. 7: Visual flight at night accidents: What you can't see can still hurt you*, (17 December 2013).

⁶ The assessment determines that there is a residual risk, but no further action is planned to be taken, and continued assessment will not likely yield further results. Dormant recommendations will not be assessed on a regular basis. However, occasional reviews will be conducted to see if any dormant recommendations should be reactivated. The Board may also reactivate a dormant recommendation at any time if actions that significantly reduce the residual risk have been taken.

recover from IIMC encounters and the comprehensive approach that Helicopter Association International (HAI) developed to IIMC that includes training on avoidance and recovery. Following this review, TC will explore the viability of enhancing instrument training prerequisites for Commercial Helicopter licenses, as well as integrating training requirements into Part VII operations, which encompass fixed-wing aircraft operations as well. TC will be in a better position in the next update to the TSB to provide details on a course of action.

In the meantime, in 2023, TC published Notice of Proposed Amendment (NPA) 2023-005-*Minimum Visual Meteorological Conditions for VFR flight in Controlled and Uncontrolled Airspace – Parts I, IV, VI, VII of the CARs and Associated Standards*⁷ for consultation on the Canada Aviation Regulation Advisory Council (CARAC). The purpose of this NPA is to amend Sections 602.114 and 602.115, along with other areas in Parts I, IV, VI, VII of the *Canadian Aviation Regulations* (CARs) and associated Standards to facilitate the introduction of Night Vision Imaging Systems (NVIS) and to increase the requirements to obtain a Night VFR rating and maintain its currency. These enhancements encompass augmented criteria for instructor and pilot training and qualification within Part IV, specifically pertaining to night VFR operations, and both Part VI and VII have been identified as regulations to be reinforced with heightened training and currency prerequisites. For example:

- **CAR 702.17** – Increased equipment requirements and qualifications for VFR flight in Minimum Flight Visibility - Uncontrolled Airspace to be equipped with the equipment required for night VFR flight under section 605.16 of the CARs.

Due to a reorganization of priorities driving TC's Forward Regulatory Plan⁸, the amendment is yet to be scheduled for publication in the *Canada Gazette*, Part I. Once the new regulations come into force, TC intends to assist flight schools, general aviation, and commercial operators in adapting to these changes. It is anticipated that these proposed modifications will yield a discernible enhancement in aviation safety, leading to a significant mitigation of accident risks.

August 2024: TSB assessment of the response (Satisfactory Intent)

In its response, Transport Canada (TC) indicated that it agrees in principle with the recommendation.

The Board is pleased that TC acknowledges the importance of ensuring pilots are equipped with the skills to effectively recover from inadvertent flight into instrument meteorological conditions (IIMC). The Board is encouraged that TC will be reviewing the regulatory

⁷ Transport Canada (2023). NPA 2023-005 - Minimum Visual Meteorological Conditions for VFR flight in Controlled and Uncontrolled Airspace – Parts I, IV, VI, VII of the CARs and Associated Standards. Available on the CARAC website at: <https://tc.canada.ca/en/corporate-services/acts-regulations/list-regulations/canadian-aviation-regulations-sor-96-433/canadian-aviation-regulation-advisory-council-carac> (last accessed on 14 June 2024).

⁸ Transport Canada (2024). *Forward Regulatory Plan*. Available at: <https://tc.canada.ca/en/corporate-services/acts-regulations/forward-regulatory-plan?pedisable=false&wbdisable=true> (last accessed on 14 June 2024).

requirements that the Federal Aviation Administration of the United States has implemented for initial and recurrent demonstration of skills to recover from IIMC encounters, along with the Helicopter Association International's approach to IIMC, which includes training on avoidance and recovery. TC stated that following this review, it will explore the viability of enhancing instrument training prerequisites for commercial helicopter licences, as well as integrating training requirements into *Canadian Aviation Regulations* (CARs) Part VII operations, which encompass fixed-wing aircraft operations as well.

Additionally, in 2023, TC published Notice of Proposed Amendment (NPA) 2023-005: *Minimum Visual Meteorological Conditions for VFR flight in Controlled and Uncontrolled Airspace – Parts I, IV, VI, VII of the CARs and Associated Standards* for consultation on the Canada Aviation Regulation Advisory Council. The NPA aims to amend regulations to introduce night vision imaging systems and increase the requirements for obtaining a night visual flight rules (VFR) rating and maintaining its currency. Other proposed amendments include increased equipment requirements and qualifications for VFR flight in minimum flight visibility in uncontrolled airspace. While the NPA is yet to be scheduled for publication in the *Canada Gazette*, Part I, once the regulations come into effect, TC intends to support flight schools, general aviation, and commercial operators in adapting to these changes.

TC's response demonstrates a commitment to ensuring pilot proficiency in IIMC recovery and shows progress through planned regulatory reviews and proposed amendments. However, the Board is concerned about the absence of timelines and lack of a detailed action plan to address the safety deficiency identified in this recommendation. Although no timeline for this initiative was provided, TC indicated that the Board could expect a more detailed action plan when it provides its next response to this recommendation. Should TC advance with these regulatory changes, it is likely that, when fully implemented, the changes will substantially reduce or eliminate the safety deficiency associated with this recommendation. Therefore, the Board considers the response from TC to Recommendation A24-01 to be **Satisfactory Intent**.

File status

The TSB will monitor TC's progress, as described above, and looks forward to future updates on actions taken to address this safety deficiency.

This deficiency file is **Active**.