

AVIATION OCCURRENCE REPORT

**VFR FLIGHT INTO IMC -
LOSS OF CONTROL**

**SOUTHERN INTERIOR FLIGHT CENTRE LTD.
CESSNA 172M C-GIWX
HOPE SLIDE, BRITISH COLUMBIA
24 APRIL 1994**

REPORT NUMBER A94P0074



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 Occurrence Report

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Southern Interior Flight Centre Ltd.

Cessna 172M C-GIWX

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Synopsis

While the pilot was attempting a west to east visual flight through the Coast Mountains of British Columbia, he entered a mountain pass that was blocked by low clouds at about the 2,100-foot elevation level. The aircraft entered the clouds, then re-appeared in a steep, nose-down attitude. It then crashed to the ground and burst into flames. The pilot and the two passengers were fatally injured; the aircraft was destroyed.

The Board determined that the pilot attempted to continue visual flight into instrument meteorological conditions. The weather conditions were unsuitable for the proposed VFR flight through the Hope Slide pass. After the aircraft entered the clouds, the pilot likely lost control. The aircraft stalled and crashed to the ground.

Ce rapport est également disponible en français.

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1.0 Factual Information

1.1 History of the Flight

On the day of the accident, the pilot flew the aircraft the short distance from Langley, British Columbia, to Abbotsford to refuel. The aircraft arrived in Abbotsford at 1128¹ Pacific daylight time (PDT)².

The pilot obtained a weather briefing from the Abbotsford Flight Service Station (FSS) and filed a visual flight rules (VFR) flight plan to Penticton. There was no known communication with the aircraft after it took off from Abbotsford at 1205 PDT.

The eastbound aircraft was subsequently seen flying at about 600 feet over the town of Hope. A few minutes later, the aircraft was observed flying adjacent to, and just above, Highway 3 in the narrow and steep mountain valley that leads over the Hope Slide. The pass was obscured by low clouds at about 2,100 feet above sea level (asl). The aircraft entered the clouds and then re-appeared in a steep, nose-down attitude. It then crashed to the ground and burst into flames. The pilot and the two passengers were fatally injured; the aircraft was destroyed.

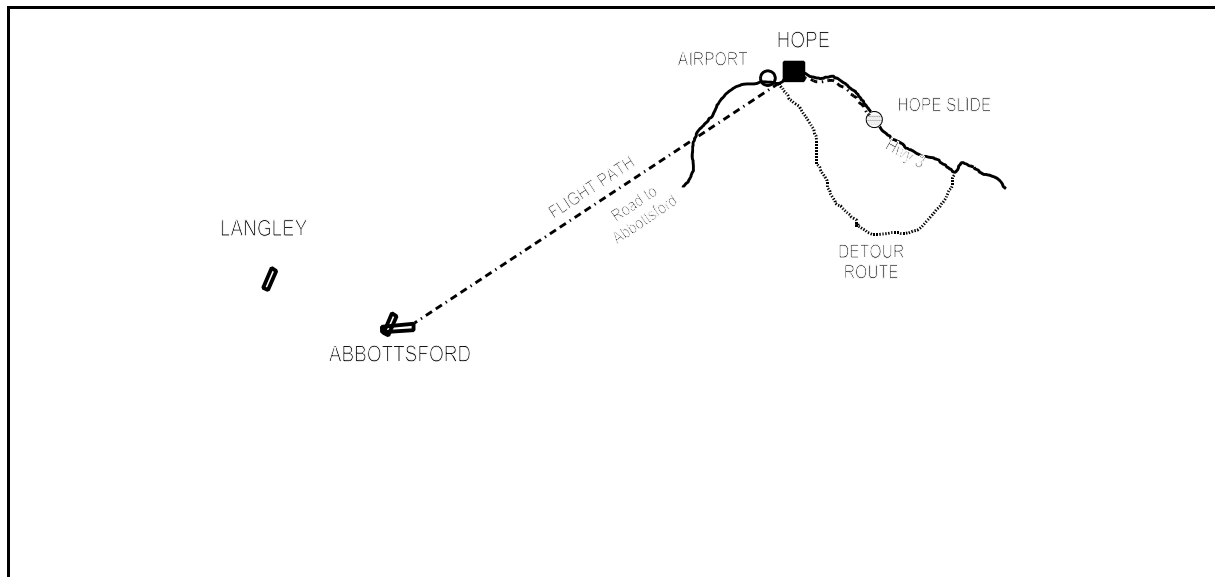


Figure 1 - Flight route

- 1 All times are PDT (Coordinated Universal Time (UTC) minus seven hours) unless otherwise stated.
- 2 See Glossary for all abbreviations and acronyms.

There was an intense post-impact, fuel-fed fire. The Hope Fire Service arrived at the accident scene at 1440 PDT, after the fire had burned itself out, and sprayed water over the wreckage to cool it down.

The location of the accident site is latitude 49°19'N, longitude 121°17'W³, at an elevation of 1,900 feet asl. The accident occurred at 1230 PDT, during daylight hours.

1.2 Injuries to Persons

	Crew	Passengers	Others	Total
Fatal	1	2	-	3
Serious	-	-	-	-
Minor/None	-	-	-	-
Total	1	2	-	3

1.3 Damage to Aircraft

The aircraft was destroyed by ground impact and the subsequent fire.

1.4 Other Damage

There was no other property damage.

1.5 Personnel Information

	Pilot-in-Command
Age	33
Pilot Licence	Private
Medical Expiry Date	01-01-96
Total Flying Time 250 hr	
Total on Type	N/A
Total Last 90 Days	N/A
Total on Type Last 90 Days	N/A
Hours on Duty Prior to Occurrence	2 hr
Hours off Duty Prior to Work Period	23 hr

3 Units are consistent with official manuals, documents, reports, and instructions used by or issued to the crew.

The pilot was certified and qualified for day VFR flight in accordance with existing regulations. He gained his private pilot licence in September 1992 in Alberta. The pilot had received 2.1 hours of dual instruction on mountain flying techniques in January 1993, but reportedly did not have a great deal of experience flying in the mountains. Most of his recent flying time had been gained flying skydivers.

1.6 Aircraft Information

	Particulars
Manufacturer	Cessna
Type	172M
Year of Manufacture	1976
Serial Number	17265949
Certificate of Airworthiness (Flight Permit)	Valid
Total Airframe Time	8,245 hours
Engine Type (number of)	Lycoming O-320-E2D (1)
Propeller/Rotor Type (number of)	McCaughey 1C160/DTM 7553 (1)
Maximum Allowable Take-off Weight	2,300 pounds
Recommended Fuel Type(s)	80/87, 100/130, 100 LL
Fuel Type Used	100 LL

The aircraft was certified, equipped, and maintained in accordance with existing regulations and approved procedures. A 50-hour maintenance inspection had been carried out on the aircraft two days before the occurrence. Eighty litres of 100 low-lead fuel (100 LL) were added to fill the aircraft tanks in Abbotsford before the flight. The weight and centre of gravity were within the prescribed limits.

1.7 Meteorological and Flight Planning Information

1.7.1 Weather Aftercast

A trough of low pressure over the southern interior of British Columbia was deepening. Meanwhile, a weak disturbance in the upper atmosphere was drifting eastward across the lower mainland. This pattern was generating a light but increasing southwesterly flow in the lower levels. Broken layers of stratocumulus based at 3,000 feet and topped at 6,000 to 8,000 feet asl and broken layers of altocumulus based at 8,000 feet covered the eastern Fraser Valley. There were additional stratus layers which formed local ceilings of 600 to 1,500 feet over the eastern Fraser Valley. Occasional light rain or drizzle locally reduced the visibility to two miles.

Near noon, the low level winds increased from the southwest and the low cloud over the eastern Fraser Valley drifted eastward and shrouded the mountains and valleys of the Coast Mountains.

1.7.2 Pilot Weather Briefing

When the pilot and the two passengers went into the Abbotsford FSS, they told the flight service specialist that they had flown into Abbotsford from Langley at an altitude of 1,500 feet and that they had often been in cloud en route.

The specialist briefed them on their intended route to Penticton. He started with the significant weather, which included, "low ceiling and visibility observed in the Fraser

valley"; he specifically included the comment from the Hope actual report, "ceiling lower in valley to the east"; he emphasized the comment "occasional marginal VFR in western

section", and told them that he did not recommend VFR flight in the Hope Slide area.

The specialist also read them a pilot weather report (PIREP) given by the pilot of another Cessna 172 which had taken off about an hour and a half earlier to fly the same proposed route. The pilot had been unable to proceed into the Hope Slide valley because of the existing low cloud, and had detoured to the south through Ross Lake, rejoining the route further east. This detour follows the valleys of the Silverhope Creek and the Skagit River, and allows an aircraft to bypass Hope Slide and rejoin Highway 3 ten miles east of the Slide at an elevation of 2,000 feet.

The pilot of the accident aircraft was also shown the actual weather conditions at Hope on a television monitor connected to a remote video camera located at the Hope Airport (elevation 128 feet asl). The video image clearly showed extensive low clouds along the proposed flight route. When the pilot left the FSS, he said that he would go as far as Hope and reassess the situation, and that he might try the Ross Lake detour. The specialist later found that the pilot had not taken the weather briefing package that had been printed for him.

1.7.3 Observed Weather

The 1100 PDT Hope Airport actual weather report given to the pilot was as follows: "1,200 scattered, 1,800 overcast, visibility 6 miles in very light rain and fog." These conditions deteriorated, and at 1200 PDT the observation was: "1,000 scattered, estimated ceiling 1,800 broken, 3,000 overcast, visibility 5 miles in very light rain and fog." About a half-hour after the accident, the Hope 1300 PDT observation was: "600 scattered, estimated ceiling 1,800 broken, 3,000 overcast, visibility 5 miles in very light drizzle and fog."

In the immediate vicinity of the accident site, the clouds were described as becoming progressively closer to the road as the altitude increased along Highway 3 to the west of Hope Slide, until the clouds were at road level prior to reaching the top of the hill. The width of the valley that leads to the Hope

Slide does not allow an aircraft to reverse its course. The elevation of the Viewpoint at Hope Slide is 2,432 feet asl.

1.8 Wreckage and Impact Information

The aircraft struck the ground in a vertical, nose-down attitude about 60 feet south of Highway 3, and 70 feet below the level of the highway. The direction of flight was 120 degrees magnetic and the elevation was 1,900 feet asl. The aircraft was destroyed by the impact forces and the subsequent fire. Continuity of the flight control cables was established and the position of the flap bellcrank indicated that the flaps had been up at impact.

The damaged engine tachometer indicator was recovered from the wreckage and sent to the TSB Engineering Branch Laboratory for examination. The laboratory report concludes that the tachometer was indicating in the range of 2,200 to 2,400 rpm at the time of impact.

After the wreckage was removed from the scene, the engine was examined by TSB investigators. No pre-impact failure or malfunction was found that would have prevented the engine from developing power. The propeller was badly scratched and gouged. The damage was consistent with that found when a propeller under power strikes hard ground.

1.9 Medical Information

Neither the pilot's medical records nor the post-mortem examination revealed evidence that incapacitation or physiological factors affected the pilot's performance.

1.10 Survival Aspects

The impact forces were such that the accident was not survivable. Witnesses quickly reached the accident site but were driven away from the wreckage by the intense heat. No transmission from the emergency locator transmitter (ELT) was reported; however, the ELT was quickly consumed by the fire.

1.11 Additional Information

1.11.1 Flights on the Preceding Days

The pilot had rented the aircraft in Kelowna, British Columbia, for the weekend. On the Friday afternoon (22 April 1994), the pilot successfully flew a one-hour check flight on the accident aircraft with Southern Interior Flight Centre's chief flying instructor in Kelowna, and then flew the aircraft to Penticton. On the Saturday, under clear skies, the pilot and the two passengers flew to Langley and parked the aircraft for the night. The following morning, the day of the accident, the pilot telephoned the fuel supplier at Abbotsford to confirm that fuel was available there, because he was unable to obtain fuel at Langley.

1.11.2 Aircraft Rental Conditions

The aircraft rental agreement contract signed by the pilot stipulated that, "All cross country flights must have a weather minimum of 4,000 feet agl and 10 miles visibility at all reporting stations along the intended route, with Terminal Forecasts predicting weather to remain above minimums for the duration of the flight."

2.0 *Analysis*

2.1 *Introduction*

There was no evidence found of any engine or airframe failure, or system malfunction prior to or during the flight. The engine rpm, flaps position, and prop damage are all consistent with the aircraft being in cruise configuration and the engine developing power at impact. The vertical, nose-down attitude of the aircraft at impact is consistent with control having been lost and the aircraft having stalled during flight in cloud.

2.2 *Flight into Unsuitable Weather Conditions*

During his briefing prior to taking off from Abbotsford, the pilot had been made aware of the prevailing low ceiling and visibility, and had been told that an earlier VFR flight had to detour around the Hope Slide because of poor weather conditions. The fact that the pilot continued the flight to the township of Hope, thereby passing the entry point for the Ross Lake detour, suggests that he may have rejected the detour as an option.

The weather at Hope had deteriorated between 1100 PDT, the time of the weather observation that the pilot received during his briefing, and 1200 PDT. The ceiling conditions of 1,800 broken observed at 1200 PDT were lower than the altitude of the Hope Slide (2,432 feet asl).

The pilot was certified for day VFR flight only. Although the weather was suitable for the VFR flight to Hope, the conditions were unsuitable for the proposed VFR flight through the

Hope Slide pass. Nonetheless, the pilot attempted to continue visual flight into the instrument meteorological conditions (IMC) that prevailed through the pass.

When the pilot began to encounter the low clouds, the valley was too narrow to permit the aircraft to reverse its course. After the aircraft entered the clouds, it is likely that the pilot lost control of the aircraft, which stalled and crashed to the ground.

3.0 *Conclusions*

3.1 *Findings*

1. The pilot was certified and qualified for the proposed day VFR flight in accordance with existing regulations.
2. There was no evidence found of any engine or airframe failure or system malfunction prior to or during the flight.
3. The weather conditions were not suitable for the proposed VFR flight through the Hope Slide pass.
4. After the aircraft entered the clouds, it is likely that the pilot lost control of the aircraft, which stalled and crashed to the ground.

3.2 *Causes*

The pilot attempted to continue visual flight into instrument meteorological conditions. The weather conditions were unsuitable for the proposed VFR flight through the Hope Slide pass. After the aircraft entered the clouds, the pilot likely lost control. The aircraft stalled and crashed to the ground.

4.0 *Safety Action*

4.1 *Action Taken*

An Aviation Notice concerning flight operations in mountainous areas was distributed to pilots in the Pacific Region. It is intended that the next issue of the Hope-Princeton and Hope-Lytton 1:500,000 VFR charts (to be available 1 April 1995) will contain a caution box which will state: "ROUTE SUBJECT TO RAPID WEATHER CHANGES - ALTITUDE SHOULD PERMIT COURSE REVERSAL - MINIMUM RECOMMENDED ALTITUDE 5,500 FEET ASL."

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board, consisting of Chairperson John W. Stants, and members Gerald E. Bennett, Zita Brunet, the Hon. Wilfred R. DuPont and Hugh MacNeil, authorized the release of this report on 22 December 1994.

Appendix A - List of Supporting Reports

The following TSB Engineering Branch laboratory report was completed:

LP 70/94 - Tachometer Indicator Analysis.

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

Appendix B - Glossary

agl	above ground level
asl	above sea level
ELT	emergency locator transmitter
FSS	Flight Service Station
hr	hour(s)
IMC	instrument meteorological conditions
PIREP	pilot weather report
PDT	Pacific daylight saving time
rpm	revolutions per minute
TSB	Transportation Safety Board of Canada
VFR	visual flight rules
100 LL	low-lead aviation gasoline, 100 octane