MINISTRY OF INFRASTRUCTURE

AIR, MARINE AND RAILWAY ACCIDENT AND INCIDENT INVESTIGATION UNIT

Tržaška cesta 19, 1000 Ljubljana

T: 01 478 81 10

E: mzi.airsafety@gov.si

www.mzi.gov.si

Number: 37200-7/2024-2430-62
Date: 11. 5. 2026

unofficial translation

FINAL REPORT

ON THE INVESTIGATION OF THE AIRCRAFT

Cessna 172,

reg. mark S5-DLM,

in the settlement of Gančani, Municipality of Beltinci,

November 17, 2024

Republic of Slovenia

» 2024 «

TABLE OF CONTENTS

TABLE OF IMAGES

INTRODUCTION

The final aircraft accident investigation report contains the facts, analysis, causes, and safety recommendations of the air accident investigation commission based on the circumstances in which the accident occurred.

In accordance with point 3.1 of Chapter 3 of Annex 13 to the Convention on International Civil Aviation (12th edition, July 2020), Article 1 of Regulation (EU) No 996/2010 of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation, the second paragraph of Article 172 of the Aviation Act (Official Gazette of the Republic of Slovenia, No. 85/24 – ZLet-1), and Article 2 of the Regulation on the Investigation of Air Accidents, Serious Incidents and Incidents (Official Gazette of the RS, No. 72/03 and 110/05), **the purpose of the final report on the investigation of an air accident is not to establish guilt or responsibility.**

The final investigation report must undoubtedly benefit aviation safety.

It is important that the final investigation report be used to prevent aviation accidents or incidents. Using the final aircraft accident report for other purposes may lead to misinterpretation.

1 SUMMARY

Date and time of accident: 17 November 2024 at 11:31 local time

Place of the accident: Municipality of Beltinci, N 46°37'20,0" E 16°15'35,5"

Type of flight: VFR flight in VMC conditions[1]

Aircraft:

- **Aircraft manufacturer:** Textron Aviation Inc., USA
- **Manufacturer's mark:** Cessna 172 M
- **Aircraft registration:** S5-DLM (registered with the Slovenian Civil Aviation Authority - CAA)
- **Aircraft serial number:** 17263632
- **Airworthiness validity:** 5 July 2025 (ARC – Airworthiness Review Certificate[2])

Owner/operator: Športno društvo Letalski center Maribor, Jurčičeva 8, 2000 Maribor

Crew and passenger information:

- **Crew**: pilot (1)
- **Number of passengers**: 2
- **Total number**: 3

Consequences:

Injuries	*Crew*	*Passengers*	*Others*
Fatal	1	2	/
Major	/	/	/
Minor/None	/	/	

Aircraft and equipment:

The aircraft and equipment were 100 percent destroyed.

[1] VFR: Visual Flight Rules – flight conducted in accordance with visual flight rules in visual meteorological conditions (VMC – Visual Meteorological Conditions – https://skybrary.aero/articles/visual-meteorological-conditions-vmc).

[2] Certificate of Airworthiness issued by an approved organisation No. HR.MG.026 (in accordance with Part-ML).

2 FACTS

2.1 Flight information

The pilot, together with two passengers, planned to conduct a flight with an overflight of his home area east of Murska Sobota. He filed a flight plan with the competent air traffic control (Slovenia Control), which included overflying VFR reporting points ME2 and ME3, overflying the town of Lendava, and returning via points ME4 and ME1 to the departure aerodrome LJMB. The aircraft took off from Maribor Aerodrome in the direction of runway (RWY) 32 at 11:09 local time. The flight initially proceeded in accordance with the plan and without any particularities.

In communication with the air traffic controller, the pilot monitored information and reported his flight altitude. Prior to overflying the vicinity of Murska Sobota Aerodrome, the aircraft began to descend. At 11:25, the pilot reported passing VFR reporting point ME3. The Maribor ATC controller instructed him to report passing the Mura River on return.

During the continuation of the flight, the aircraft continuously decreased its altitude, such that between the settlements of Gančani and Lipovci it was flying straight and level at an altitude of 1,400 feet (426 m) QNH (the terrain elevation in this area is 560 feet or 170 m). After passing the settlement of Gančani, the pilot initiated a right turn. During the right turn manoeuvre, the aircraft continued to descend and impacted terrain approximately 950 m southeast of the settlement of Gančani. Upon impact with the terrain, all three occupants of the aircraft lost their lives.

Figure 1: Radar recording of the entire flight trajectory

2.2 Injuries to Persons

Injuries	*Crew*	*Passengers*	*Others*
Fatal	1	2	-
Serious	-	-	-
Minor/None	-	-	

2.3 Damage to Aircraft

Upon impact with the terrain, a small crater approximately 30 cm deep and about 70 cm long was formed along the crash path. Aircraft wreckage was distributed over a distance of approximately 90 m from the initial point of impact. Both wings separated from the fuselage upon impact. The propeller blades were surface-damaged and bent (see figure below).

The engine separated from its mounts upon impact and came to rest along the crash path near the tail section. The aircraft cabin structure was completely destroyed and unrecognisable along the crash path. The lower part of the cabin, together with the rear seats, remained beneath the fuselage, which was inverted. The remaining part of the fuselage was inverted and resting on the vertical stabiliser.

Along the crash path, parts of the landing gear, wings, cabin and equipment were found. Within the wreckage area, the ELT device was located; it did not activate.

Figure 2: Fractured propeller blades at the accident site

Figure 3: Aircraft wreckage along the crash path

2.4 Damage to Other Property

A minor quantity of oil and fuel was spilled onto cultivated agricultural land.

2.5 Pilot Information

The pilot, aged 33, a Slovenian national, held:

- a Private Pilot Licence – Aeroplane PPL(A), issued on 3 October 2019,
- a SEP(Land) rating, issued on 15 September 2023 by examiner No./Exam.SI No.154, valid until 30 September 2025,
- a Class 2 Medical Certificate, valid until 15 January 2028, and a LAPL medical certificate with the same validity, issued by an authorised medical examiner SI.MED.2777 on 10 January 2023.

The pilot's total flight time up to the date of the accident amounted to 93 hours and 35 minutes.

2.5.1 Pilot Licence Information

TYPE OF LICENCE:	PRIVATE PILOT LICENCE PPL(A)
State of issue:	Republic of Slovenia
Licensing authority:	Civil Aviation Agency of the Republic of Slovenia-CAA
Licence number:	SI.FCL.P.A.000963
Date of issue:	3 October 2019
Last SEP revalidation[3]:	15 September 2023 (valid until 30 September 2025)
Additional privileges:	CVFR valid until 25 September 2023
Remarks:	/

2.5.2 Pilot Medical Certificate Information

Type of medical certificate:	CLASS 2 MEDICAL CERTIFICATE
State of issue: Approved medical examiner number:	Republic of Slovenia SI.MED.2777
Date of examination and expiry date:	10 January 2023, valid until 15 January 2028
Limitations:	/

2.5.3 Pilot Experience

The pilot commenced training in 2018 at the aviation school LC Maribor, where the majority of practical training was conducted on the Cessna 152 aeroplane. During training, he also flew the Cessna 172, on which he accumulated 5 flight hours prior to the skill test. The pilot accumulated a total of 54 hours and 7 minutes during training prior to obtaining the PPL licence. He successfully passed the PPL skill test on 12 September 2019.

Pilot experience by aircraft type/variant:

After obtaining the PPL licence, the pilot accumulated 39 hours and 28 minutes, of which 8 hours and 32 minutes were flown under dual instruction (Dual Instruction – flight with an instructor on board). The pilot's total flight time up to the date of the accident amounted to 93 hours and 35 minutes.

- On the Cessna 152, the pilot accumulated a total of 70 hours and 26 minutes.
- In 2020, he completed 3 flights for conversion training on the Tecnam P2008 aircraft, VLA category (MTOM 650 kg), with a total of 2 hours and 24 minutes.

[3] SEP (Land) (Single Engine Piston Land) – Class ratings for single-engine piston aeroplanes (SEP) are valid for 2 years

- On the Cessna 172, he accumulated a total of 20 hours and 45 minutes (combined on S5-DLM and S5-DEB). On the accident aircraft (S5-DLM), he accumulated a total of 15 hours and 45 minutes. His last flight on the Cessna 172 was in August 2023.

Pilot experience in the last three years:

- Total flight time in 2022: 1 hour and 47 minutes
- Total flight time in 2023: 8 hours and 20 minutes
- Total flight time in 2024: 2 hours and 45 minutes (all on C-152)
- Total flight time in the last 90 days: 0 hours and 45 minutes (all on C-152)
- Total flight time in the last 30 days: /
- Total flight time in the last 24 hours prior to the accident: /

From the above data, it follows that the pilot was relatively inexperienced in relation to the complexity and circumstances of the flight. After obtaining the PPL licence, he accumulated a total of 39 flight hours over approximately five years. He maintained his qualifications for VFR flight in visual meteorological conditions with intermittent flying activity.

Based on a detailed review of the pilot's total flight time, including hours flown in the aerodrome traffic circuit, en-route, training circuits, and check flights, and based on data obtained from the aircraft owner and records from the pilot's file at the CAA, it was established that the pilot held a valid licence, was familiar with the aircraft performance and limitations, and was also familiar with the "Emergency Procedures" as defined by the aircraft manufacturer in the Pilot's Operating Handbook (POH).

The aircraft owner used a revision of the Pilot's Operating Handbook issued by the manufacturer in 1975/1976, with the supplement "Pilot Safety and Warning Supplements" issued on 1 June 1998. The pilot did not hold an IR(A) rating for flight in reduced visibility conditions and did not have practical experience in flying under Instrument Flight Rules (IFR).

2.6 Aircraft Information

The Cessna 172 Skyhawk is a single-engine, four-seat light aeroplane manufactured by the Cessna Aircraft Company, now known as Textron Aviation Company. The dimensions of the Cessna 172 Skyhawk are: length 8.28 m, wingspan 11 m, and height 2.72 m. The high-wing configuration provides improved downward visibility of the terrain.

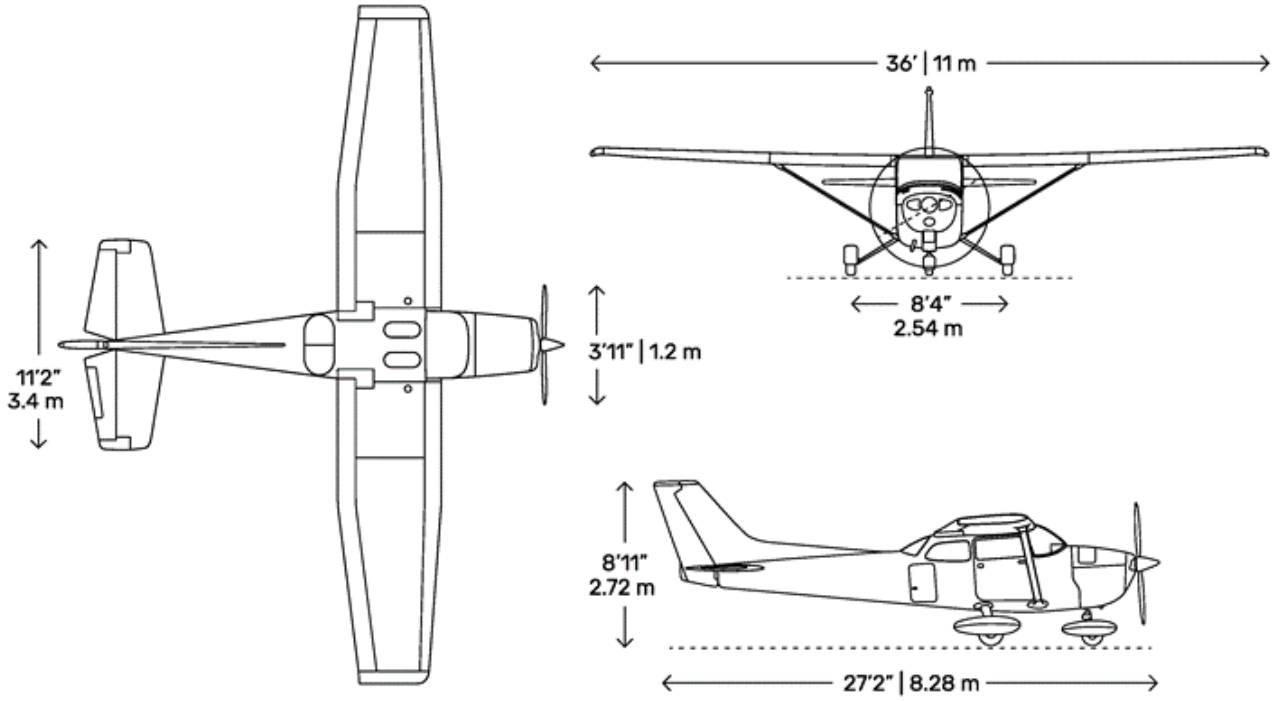

Figure 4: Aircraft dimensions

- Aircraft type: four-seat powered aeroplane manufactured by Textron Aviation Company, USA
- Type: Cessna 172M; serial number: 172-63632; year of manufacture: 1975
- Maximum take-off mass – MTOM: 1,043 kg
- Operator/Owner: Letalski center Maribor, sports association
- Date of entry into the register: 12 January 2017
- Registration: S5-DLM; register number: 1173; date of registration: 12 January 2017
- Airworthiness Review Certificate (ARC): valid
- Last ARC renewal: 5 July 2024 (valid until 5 July 2025)[4]
- Total time in service: 7,190 hours and 58 minutes (as of 16 October 2024)[5]

2.6.1 Engine Information

- Manufacturer: Lycoming
- Type: O-320-E2D, four-cylinder engine, 150 HP at 2,700 RPM
- Serial number: L-24349-27E
- Last inspection: 10 October 2024; total time: 7,185 hours; time remaining to overhaul: 873 hours

[4] Issued by an approved organisation under Part-ML No. HR.MG.026

[5] Based on maintenance documentation review, work order No. WO/117/24

2.6.2 Propeller Information

- Manufacturer: McCauley
- Serial number: 723654
- Type: 1C160/DTM7553
- Time since overhaul: 1,823 hours and 34 minutes (inspection dated 10 October 2024)

2.6.3 Other Aircraft Information

The aircraft, previously registered with the Croatian aviation authorities under registration 9A-DVT, was acquired in 2016 for the purpose of aviation activities within the club and for training within the LCM flight school. In practice, the aircraft entered service in January 2017, when it was entered into the Slovenian aircraft register by decision of the CAA.

The aircraft owner ensured regular maintenance through an approved maintenance organisation and enrolled the aircraft in a CAMO organisation for continuing airworthiness management[6]. Following the registration of the aircraft in the Slovenian register, the CAA issued a decision authorising the owner (LCM) to use the aircraft for private operations and for flight training. Commercial air transport operations were not permitted with this aircraft.

For the use of the aircraft, the owner established internal procedures defining the conditions for conducting introductory flights [7]and flights for the purpose of maintaining pilot qualifications.

Analysis of the aircraft maintenance data established that the aircraft was not in use from 5 October 2023 until the end of June 2024. During this period, following a “hard landing” event, a major inspection and repairs to the aircraft landing gear were required.

Following the analysis of records of scheduled and unscheduled maintenance, additional review was conducted of the documentation related to the engine overhaul performed in 2021. The documentation was consistent with the engine inspection data (identification number L-24349-27E), the data from work orders of the approved maintenance organisation, and the documentation held by the CAMO organisation.

Minor administrative errors were identified in the transcription of data within maintenance organisations, such as the recording of the engine identification number. These errors did not affect

[6] https://www.caa.si/zacetna-in-stalna-plovnost.html

the traceability of data in the documentation relating to the aircraft, engine, propeller, and equipment.

2.6.4 Maintenance Information

National and international aviation regulations for the general aviation category require that the aircraft owner ensures proper record-keeping of technical maintenance and airworthiness documentation[8]. Based on documentation obtained from the owner, it was established that the aircraft was maintained under a previously concluded contract with an approved maintenance organisation, which maintained the aircraft in accordance with the manufacturer's instructions and the maintenance manual.

Scheduled periodic inspections of the aircraft for the years 2023 and 2024 are presented in the table below (inspections of the Cessna 172M, registration S5-DLM).

No.	Date	Type of Inspection (50, 100 or 100/200 hrs)	Aircraft Total Time (hrs)
1	10 Oct 2023	100-hour inspection	6743
2	15 Mar 2023	50-hour inspection	6785
3	4 May 2023	100/200 hrs / Annual	6835
4	14 Jun 2023	50 hrs	6891
5	12 Jul 2023	100 hrs	6942
6	18 Avg 2023	50 hrs	6986
7	15 Sep 2023	100/200 hrs / Annual	7039
8	5 Jul 2024	Hard landing inspection, Annual difference, 50 hrs, out-of-phase items (work order No. WO 144/235SDLM-10)	7039
9	15 Avg 2024	100 hrs	7135
10	27 Avg 2024	Shimmy damper servicing	7151
11	10 Oct 2024	50 hrs	7185
12	16 Oct 2024	Nose landing gear (NLG) tire replaced	7190

[7] LCM established an Operations Manual for the conduct of introductory flights – latest revision No. 027 dated 29 May 2023

[8] Maintenance is the process of ensuring that a system continuously performs its intended function at the planned level of reliability and safety.

From the aircraft documentation (Journey Logbook, Technical Logbook, engine logbook and propeller logbook), it was established that, up to the date of the accident, the aircraft had accumulated a total time of 7,204 hours and 41 minutes. Cross-checking of the documentation confirmed that the data were accurate and properly maintained.

2.6.5 Aircraft journey Logbook Information

A review of the aircraft Journey Logbook[9] data, showing the use of the aircraft in the 30 days prior to the occurrence, was conducted.

Date	Number of Flights	Purpose of Flight	Total Time
15 Oct 2024	2 (15+50 min)	Schooling 2x	1 hour 10 min
19 Oct 2024	1 (30 min)	Local (aerodrome traffic zone)	0 hours 30 min
20 Oct 2024	3 (21+25+30 min)	Local, navigation flight	1 hour 16 min
21 Oct 2024	2 (35+35 min)	En-route, traffic circuits	1 hour 10 min
22 Oct 2024	4 (12+60+18+17)	Navigation flight, en-route	1 hour 47 min
23 Oct 2024	1 (49 min)	Local, traffic circuits	0 hours 49 min
26 Oct 2024	3 (20+20+30 min)	Local	1 hour 10 min
27 Oct 2024	1 (30 min)	Local	0 hours 30 min
28 Oct 2024	1 (50 min)	Schooling	0 hours 50 min
29 Oct 2024	3 (80+65+35 min)	En-route, SEP, schooling	3 hours 00 min
30 Oct 2024	2 (43+30 min)	En-route, introductory flight	1 hour 13 min
31 Oct 2024	3 (15+30+30 min)	Local, introductory flights	1 hour 15 min
3 Nov 2024	/	Planned flight: En-route	/
15 Nov 2024	1 (60 min)	Schooling	1 hour 00 min
17 Nov 2024	1 /	Planned flight: En-route	/

The review of the aircraft logbooks did not reveal any errors or discrepancies regarding the proper maintenance of records, which include data entered during pre-flight preparation and data recorded after completion of the flight. In the 30-day period prior to the accident, the aircraft performed 27 flights with a total flight time of 15 hours and 40 minutes.

In the aircraft Journey Logbook (page No. 0094118) dated 3 November 2024, the pilot involved in the accident recorded that the flight had been cancelled. During pre-flight preparation, the pilot assessed that the Garmin device in the aircraft was not functioning properly and that it prevented

[9] Aircraft Journey Logbook for aircraft S5-DLM, logbook No. 19

radio communication. In the Journey Logbook, under remarks on 3 November 2024, the pilot noted: "Garmin reset every 20 seconds, also switching frequencies, and we had to cancel the flight."
The aircraft owner was informed of the recorded remark in the aircraft logbook. According to the statement of the person responsible for aviation safety at LCM, no fault was identified on the aircraft and therefore no corrective action was required. Between 3 November 2024 and 15 November 2024, there were no findings confirming the reported issue by the owner or the maintenance organisation, nor were there any records of maintenance actions carried out in this regard. It was also not established that any radio communication malfunctions occurred.
The next flight was conducted two days before the accident, on 15 November 2024. The flight, carried out for the purpose of practical training, lasted 60 minutes. The instructor (pilot) and the student did not report any issues related to the malfunction previously noted on 3 November 2024. Radio communication operated normally.

2.6.6 Weight and Centre of Gravity

In the aircraft Pilot's Operating Handbook (POH), the manufacturer specified the method for calculating the maximum permissible take-off mass for the "normal"[10] category, with the warning that the MTOM (maximum take-off mass) must not be exceeded. The maximum take-off mass (MTOM) for aircraft S5-DLM is 2,300 lb (1,043 kg).

A review of the documentation from the last aircraft weighing shows that the empty weight of the aircraft was 1,468.28 lb (666.15 kg). If the weight is multiplied by the distance from the reference datum (arm), the moment is obtained[11].

The aircraft owner established, in the operational documentation, the method for calculating W&B in accordance with the instructions in the aircraft manufacturer's operating handbook, taking into account the values from the last aircraft weighing performed by the maintenance organisation on 9 January 2018.

Weight and Balance Calculation

A review of the refuelling documentation showed that, two days before the occurrence, on 15 November 2024, the aircraft fuel tanks contained a total of 100 litres of fuel before flight. After

[10] The aircraft is certified in both the normal and utility categories. The normal category applies to aircraft intended for non-aerobatic operations, including manoeuvres associated with normal flight, stalls, and turns with a bank angle not exceeding 60°.

completion of a one-hour flight (average fuel consumption 36 litres/hour), approximately 60 litres of fuel remained in the tanks.

On the day of the accident, during pre-flight preparation, the pilot added 80 litres of fuel and entered in the aircraft Journey Logbook that the tanks were full = 150 litres LL (150 litres × 0.72 = 108 kg).

For the calculation of persons' mass, a value of 75 kg per person is used, which in this case amounts to a total of 225 kg.

Input data for the Weight and Balance calculation:

- Empty Weight = 666.15 kg
- Pilot front seat = 75 kg
- Two passengers rear seats = 150 kg
- Fuel (AVGAS 100LL) total 150 litres (108 kg)
- No baggage

Item	Mass (kg)	Arm (in)	Moment (kg.in)
Empty Weight	666.15	39.5	26,286
Pilot (front seat)	75	37.0	2,775
Rear seats (two passengers)	150	73.0	10,950
Fuel (150 l = 108 kg)	108	48.0	5,184
Total	999.15 kg	-	45,195

Calculation of the centre of gravity (CG): the value of the total moment (45,195) is divided by the total mass (999.15), resulting in a CG position of 45.2 in.

Findings:

- The maximum permissible mass was not exceeded.
- The CG was within the range of 35–47.3 in.
- The flight was permitted in the "normal" category.
- The CG value (in inches from the datum plane) was within the permitted envelope.

[11] Moment is a measure of the gravitational force that causes rotation about a point or axis and is expressed in inch-pounds (in-lb).

2.7 Meteorological Information – Description of Weather Conditions on 17 November 2024[12]

An area of low pressure was present over northern Europe, while central Europe and the local region were under a field of relatively uniform pressure. In the lower layers, more humid air was advected into the area by south-westerly winds.

Weather conditions in the vicinity of Gančani around 12:00 local time

East of the approximate line Mureck (Austria) – Ormož, fog was present, which did not extend fully to the far northeast of Slovenia, while west of this imaginary line conditions were mostly clear with good visibility. Based on imagery from nearby cameras and meteorological model calculations, the fog layer was estimated to extend up to approximately 1,000 ft AGL (about 300 m above ground level).

Based on data from the automatic weather station Murska Sobota (microlocation Rakičan), the horizontal visibility was estimated at approximately 300 m, and the vertical visibility at approximately 200 ft AGL (about 60 m above ground level). The surface temperature was –0.2 °C. Surface wind was variable in direction with a speed of 3 to 5 kt.

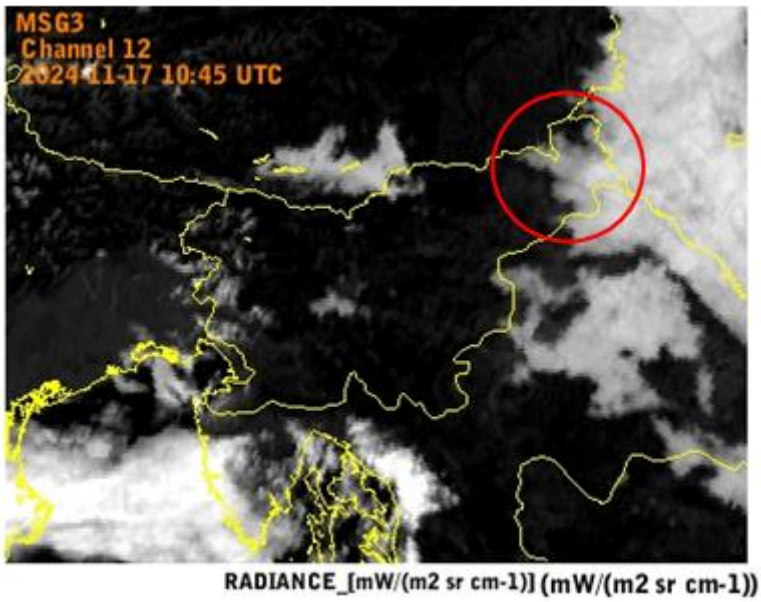

Figure 5: Satellite image (EUMETSAT) in the visible spectrum at 11:45 LT

[12] Data provided by the Slovenian Environment Agency (ARSO)

Figure 6: View from the Murska Sobota meteorological station (Rakičan) towards the southwest at 11:50 local time

Figure 7: View from the Jeruzalem meteorological station (elevation 335 m AMSL) towards the southeast. It can be seen that the top of the fog layer is only slightly above the location

The METAR from Edvard Rusjan Maribor Aerodrome indicates that weather conditions west of the fog-affected area were without significant phenomena:

METAR LJMB 171100Z 05003KT 020V090 CAVOK 06/00 Q1013=

The GAFOR forecast, issued at 06:00 UTC[13], indicated poor expected conditions for VFR flight on route 40 across Prekmurje, with an expected improvement in the afternoon. In the time window from 10:00 to 12:00 local time, **the forecast conditions for VFR flight were marked as X**.

The forecast issued at 10:00 UTC no longer indicated improvement, but rather poor conditions for the entire day. In both forecasts, the expected weather conditions at the time of the accident were unfavourable.

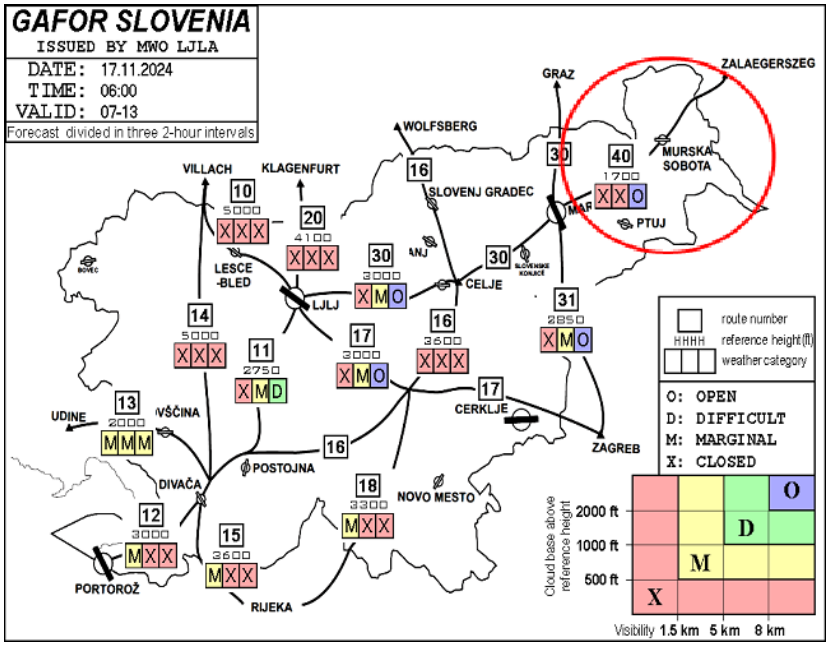

Figure 8: GAFOR forecast issued at 07:00 local time: in the time window from 10:00 to 12:00 local time, the forecast conditions for VFR flight on route 40 were marked as X

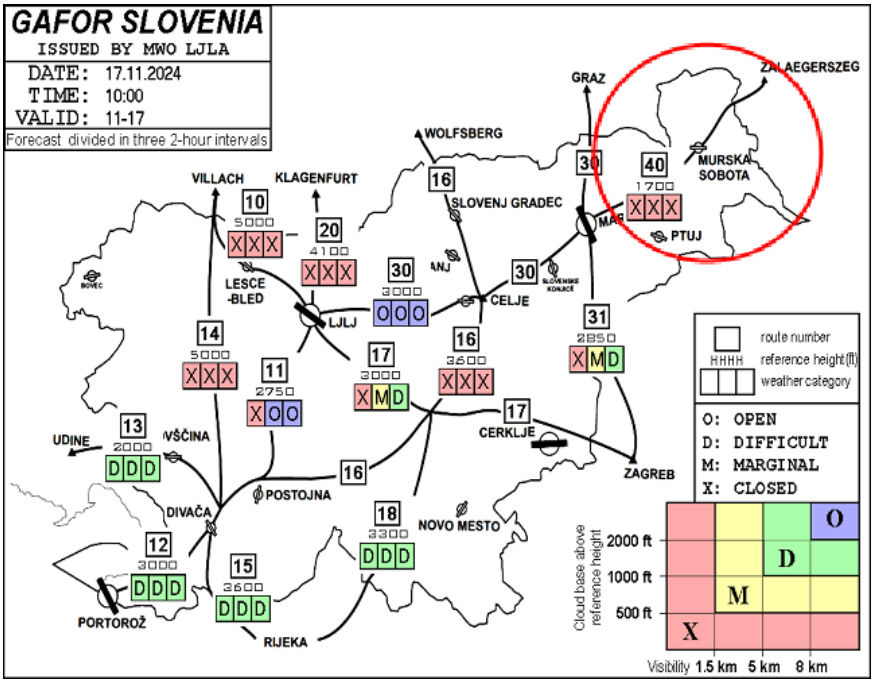

Figure 9: GAFOR forecast issued at 11:00 local time. In all time windows, the forecast conditions for VFR flight on route 40 were marked as X

[13] Coordinated Universal Time (UTC). Local time is UTC +1.

Weather Summary

On 17 November 2024, at approximately 11:50 local time, the following weather conditions prevailed in the vicinity of Gančani:

- air temperature −0.2 °C;
- estimated horizontal visibility approximately 300 m;
- estimated vertical visibility approximately 200 ft AGL;
- the fog layer extended to an estimated height of approximately 1,000 ft AGL;
- surface wind was variable in direction with a speed of up to 5 kt.

The **GAFOR**[14] forecast is determined based on horizontal visibility and cloud base height above the reference altitude of the route. Cloud coverage must be five octas or more. The more restrictive condition is used for the classification.

GAFOR classes:

➤ **X – CLOSED**: horizontal visibility less than 1.5 km or cloud base below 500 ft above the reference altitude.

➤ **M – MARGINAL**: horizontal visibility less than 5 km or cloud base below 1,000 ft above the reference altitude.

➤ **D – DIFFICULT**: horizontal visibility less than 8 km or cloud base below 2,000 ft above the reference altitude.

➤ **O – OPEN**: horizontal visibility greater than 8 km or cloud base above 2,000 ft above the reference altitude.

2.8 Navigation Aids

The aircraft was equipped with a GARMIN GNS 430 navigation unit, which operates as a GPS device intended for navigation during departure and arrival to/from a selected point, and enables the display of information on individual aerodromes and frequencies.

According to statements obtained from pilots who had flown aircraft S5-DLM, the device was not used in practice due to the poor display resolution. There is no evidence that the pilot used, or had the possibility to use, mobile GPS navigation. No VFR chart (map) was found at the accident site.

[14] Instructions for reading the GAFOR chart – https://www.caa.si/upload/editor/file/file7985fab0262395d.pdf

2.9 Communications

The Aeronautical Information Publication[15] (AIP) specifies that the frequency 119.205 MHz is used for radio communication at LJMB Aerodrome. On the day of the occurrence, radio communication was available on the stated frequency.

Prior to the flight, the pilot checked the operability of the aerodrome radio frequency and established radio communication with the air traffic controller. For the purpose of the investigation, audio recordings and transcripts of the voice communication were provided by the competent Slovenia Control.

A partial transcript of the communication between S5-DLM and the air traffic controller is presented below. During this time, other aircraft were also on the frequency, but they were not in the vicinity of the occurrence.

Source of recording	Ricochet recording system
Recording location	FTP server
Recording date	17 November 2024
Recording time interval	From 10:00 to 11:10 UTC (local time = UTC +1)
Type of voice communication	119.205 MHz, Frequentis

Time (UTC)	ATC/ACFT	Communication on Frequentis
10:00:03	S5-DLM	Maribor approach S5-DLM…[nerazumljivo] request taxi for line up for VFR flight to Murska and back
	TWR MB	S5-DLM Maribor approach dober dan QNH1014 taxi to holding point runway 32 via B, follow Evektor
	S5-DLM	QNH1014 em taxi to holding point via B runway 32 S-LM
	TWR MB	S-LM squawk 3373
	S5-DLM	Squawk 3373 S-LM
	TWR MB	And S-LM report requested altitude
	S5-DLM	1000 AGL S-LM
	TWR MB	1000ft AGL approved, report ready for departure
	S5-DLM	Will report ready for departure S-LM
10:08:38	S5-DLM	S-LM ready
	TWR MB	S-LM line up runway 32
	S5-DLM	Lining up runway 32 S-LM

[15] https://aim.sloveniacontrol.si/aim/

10:09:10	TWR MB	S-LM runway 32 clear for take off wind 090deg 2kts
	S5-DLM	Clear for take off runway 32 S-LM…
10:11:53	TWR MB	S-LM traffic formation of 3 Cessnas in zone Duplek on 2500ft
	S5-DLM	Will look out for traffic S-LM
10:12:54	S5-DLM	Request climbing out to 3500ft S-LM
	TWR MB	S-LM 3500ft approved
	S5-DLM	3500ft is approved S-LM
	TWR MB	S-LM traffic formation now on your 2 o clock 2300ft
	S5-DLM	Traffic insight S-LM
10:19:11	S5-DLM	Overhead ME2, ME3 next S-LM
	TWR MB	S-LM roger continue
	S5-DLM	Continuing S-LM
10:25:34	S5-DLM	Abeam ME3 S-LM
	TWR MB	S-LM roger, report crossing Mura river on your way back
	S5-DLM	Will report crossing Mura river on the way back S-LM
10:46:17	TWR MB	S5-DLM report position
11:00:44	TWR MB	S5-DLM Maribor approach
11:01:05	TWR MB	S5-DLM Maribor approach report position
11:02:37	TWR MB	S5-DLM Maribor approach…
…		

2.10 Aerodrome Information

N/A

2.11 Flight Recorders

Aviation regulations for this category of aircraft do not require flight recorders. No flight data or cockpit voice recorders were installed on the aircraft.

2.12 Radar and Sensor Data

Radar recordings and flight track data were obtained during the investigation from Slovenia Control and the Flightradar24 application. Data from Slovenia Control, obtained via the aircraft transponder, were further analysed for the purpose of flight reconstruction.

Figure 10: Last radar return of S5-DLM prior to impact with terrain at 10:31 UTC

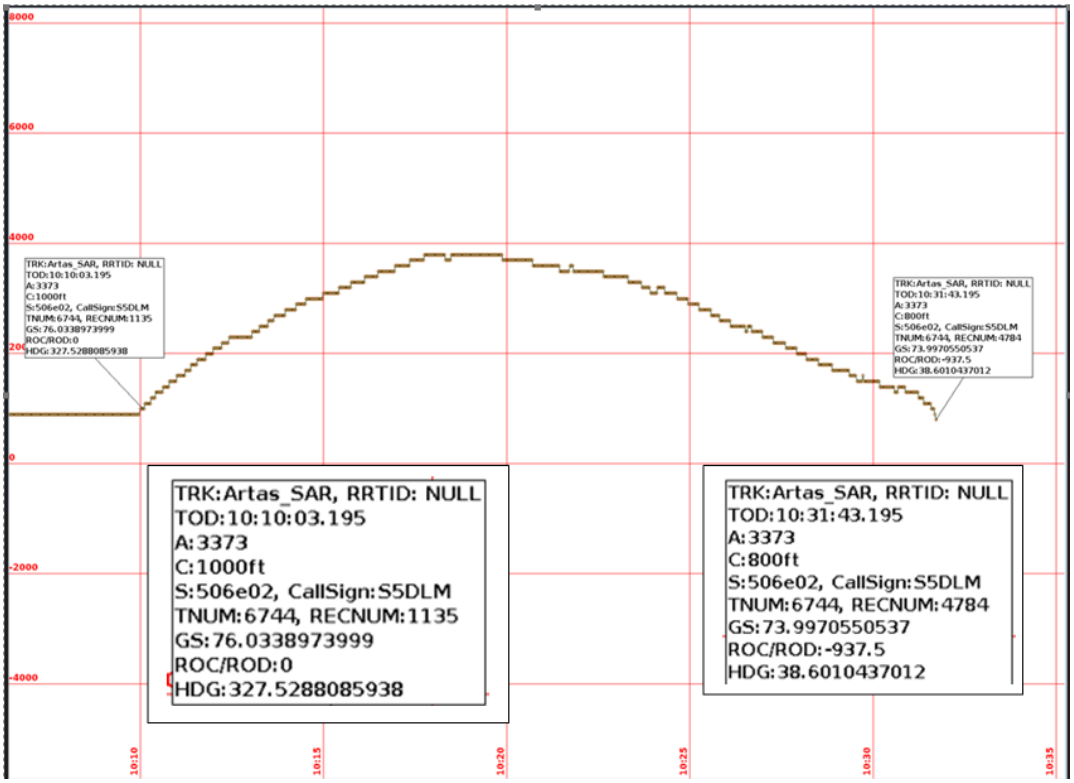

Figure 11: Profile of altitude changes of S5-DLM from take-off to the time of the accident

2.13 Accident Site Information

The investigator of the Air Accident Investigation Service was notified of the accident a few minutes after the occurrence by the Emergency Response Centre (OKC) Murska Sobota and subsequently by LC Maribor. The police secured the accident site prior to the arrival of the investigator-in-charge.

The investigator-in-charge conducted an on-site investigation on the same day. Prior to his arrival, representatives of emergency medical services, firefighters, police officers and representatives of the criminal police (SKP PU Murska Sobota) were present at the accident site.

At the time of the site inspection, fog was present, visibility was reduced, humidity was 100%, and the air temperature was 2 °C. The aircraft wreckage was concentrated along the crash path over a length of approximately 90 m from the initial ground impact and a width of approximately 20 m. There was no post-impact fire.

The bodies of the deceased were, after documentation at the site, transferred to the Institute of Forensic Medicine (ISM) Ljubljana. The site inspection was conducted jointly with the police investigation and continued until the late evening hours.

After completion of the on-site investigation, the aircraft wreckage was, in the presence of the investigator, transported to a secured facility at Maribor Aerodrome (LJMB).

Figure 12: Accident site of S5-DLM (photo: Police Directorate Murska Sobota)

2.14 Medical and Pathological Information

A review of the pilot's medical documentation established that there were no medical conditions or limitations that could have contributed to the accident. The pilot was in an appropriate state of health. Toxicological analysis conducted by the Institute of Forensic Medicine (ISM) was negative.

Analysis of the recorded flight path data indicates that the aircraft was being controlled up to the moment of impact with the terrain. There were no indications that the pilot was incapacitated or unable to safely operate the aircraft. The investigation concludes that the pilot's medical condition did not contribute to the accident.

2.15 Fire

There was no fire.

2.16 Survivability

There were no survivable conditions in this case.

2.17 Investigation Process

On the day of the occurrence, the investigator-in-charge conducted an on-site investigation together with representatives of the police. Following completion of the site inspection, the aircraft wreckage and evidentiary material were transported to secured facilities at Edvard Rusjan Maribor Aerodrome.

Documentation relating to the aircraft, the pilot, and operational documents of LC Maribor were obtained from the aircraft owner. During the investigation, additional examinations of the aircraft wreckage, engine, propeller, and control linkages were carried out.

Slovenia Control provided radar recordings, flight data obtained via the radar transponder, and data on voice communications conducted on the LJMB frequency.

Documentation relating to the pilot, the aircraft, the owner, and records of administrative and inspection oversight were obtained from the CAA.

Interviews were conducted with responsible personnel within the organisational structure of LC Maribor, as well as with individuals involved in aviation activities at the time of the occurrence.

In the initial phase of the investigation, preliminary safety recommendations were issued concerning the conduct of introductory flights in the Republic of Slovenia. The investigation was completed in January 2026. The draft final report was submitted to the relevant parties in March 2026.

2.18 Additional Information

Based on statements obtained in the initial phase of the investigation, it was established that the purpose of the flight was a gift, in the form of a voucher for a sightseeing flight[16], which had been given to one of the passengers for his birthday in 2023. The pilot and the passenger who received the voucher from his friends had known each other for a longer period. The costs of the flight were paid by bank transfer directly to the LCM account, and the amount was recorded by LCM as a payment by the pilot for aircraft rental.

It was established that the sightseeing flight had been presented by the pilot on two occasions. According to witness statements, it was first planned in October 2024 but was cancelled due to unsuitable weather conditions. The second flight was planned for 3 November 2024; however, it was not conducted due to technical issues, as decided by the pilot (details provided in section 2.6.5 of this report "Aircraft Journey Logbook Information").

In the initial phase of the investigation, an analysis was conducted of the regulations governing commercial and non-commercial operations in the general aviation (GA) category in the Republic of Slovenia, an analysis of the practical implementation of introductory flights[17] by providers and certificate holders authorised to conduct such flights in Slovenia, and an analysis of the conduct of introductory flights by aviation entities in EU Member States.

Based on the findings of the analysis of the legal framework and the practical implementation of introductory flights in the Republic of Slovenia, the investigation issued preliminary safety recommendations in the initial phase, addressed to the aviation supervisory authority (CAA). Further details are provided in section 3.3 of this report.

[16] The term "sightseeing flight" is derived from the wording used on the gift voucher presented to one of the passengers.

[17] Introductory flights may be conducted by private law entities established in accordance with the Associations Act and by training organisations established in accordance with Commission Regulation (EU) No 1178/2011.
Link: https://www.caa.si/uvodni-leti-nco.html

2.19 Investigation Techniques

Standard investigation techniques were applied. An additional analysis of documentation relating to scheduled and unscheduled aircraft maintenance inspections was conducted at the approved maintenance organisation.

Cross-checking of data was carried out using documentation relating to the aircraft, engine, propeller, and equipment, maintained by the owner (LC Maribor), the maintenance organisation, the approved CAMO organisation, and the aviation supervisory authority (CAA).

During the process of data collection and inquiry, assistance was provided to the investigator by the police. In the part of the investigation relating to the acquisition of radar recordings and data from the S5-DLM transmitter (transponder), assistance was provided by Slovenia Control.

3 ANALYSIS

3.1 General

The investigation did not identify any evidence of malfunction of the aircraft systems, engine, propeller, or equipment. Following examinations of the aircraft wreckage, engine, and propeller, no evidence of malfunctions or mechanical failures was found that would indicate irregularities in engine or propeller operation during the flight.

Based on radar recordings and data obtained from Slovenia Control via the aircraft transponder, a detailed analysis of the flight and of the manoeuvre performed prior to the crash was conducted during the investigation.

At the accident site, the flight instruments and engine indication instruments were completely destroyed. The barometric pressure setting on the altimeter, which was recovered from the wreckage, was set to QNH 1014 hPa, corresponding to the pressure information provided to the pilot by the air traffic controller prior to the flight.

The terrain elevation at the accident site is 178 m (590 ft). The aircraft was flying at an altitude of 1,400 ft (approximately 250 m above ground level) in the vicinity of the settlement of Gančani.

3.2 Flight Preparation

Prior to the flight, weather forecasts were available indicating that conditions were suitable for VFR flight; however, they were not suitable for the segment of the planned route submitted by the pilot to the competent ATC, particularly with regard to the planned flight altitude of 1,000 ft AGL. This was especially relevant as part of the flight was to be conducted in an area with low cloud and fog, which are typical for this time of year.

Meteorological forecast data were available on the ARSO[18] website, where aviation weather information is published. The investigation could not determine whether the pilot had reviewed the available meteorological information provided by ARSO during pre-flight preparation.

Weather assessment was particularly important for the area where the pilot planned to fly at an altitude of approximately 300 m above ground level. Analysis of the available data, particularly photographs taken from the air a few minutes prior to the accident, indicated that the area northeast of the Mura River was significantly covered by low cloud.

3.3 Analysis of Regulations and Events Prior to the Flight

The investigation established that the flight was based on a gift in the form of a voucher for a sightseeing flight in a Cessna 172, which had been presented to one of the passengers for his birthday. The voucher included the option to select the destination of the sightseeing flight, the pilot's contact details, and a signature on behalf of the aircraft owner, LCM.

The background and purpose of the flight conducted by the pilot involved in the accident were initially identified as an "introductory flight", for which the pilot did not have authorisation from the aircraft owner and did not meet the minimum experience requirements specified in the LCM Operations Manual[19] for conducting introductory flights.

In the initial phase of the investigation, the Commission conducted several inquiries and analyses related to the conduct of introductory flights in the Republic of Slovenia. Based on analyses of information regarding holders of approvals for introductory flights, results of CAA inspection oversight, witness statements, inquiries with certified aviation entities and individuals, and analysis of online marketing and promotion of introductory (in practice often referred to as sightseeing)

[18] https://www.meteo.si/met/sl/aviation/

[19] Operational Manual for the Conduct of Introductory Flights LCM – latest revision No. 027 dated 29 May 2023.

flights in Slovenia, the Commission, following publication of the preliminary report, assessed that there was a risk of recurrence of a similar accident.

The Commission identified deviations from the intended purpose and objectives of introductory flights in Slovenia, including inconsistencies in the interpretation of the legal framework governing such operations. This framework was based on the CAA Operational-Technical Requirement (OTZ) for introductory flights (Official Gazette of the RS, No. 16/21) and on Regulation (EU) No 965/2012, as amended. The primary purpose of introductory flights conducted by aviation organisations (aeroclubs, flight schools, aviation associations) is to promote their activities and attract new students and members.

The OTZ in force at the time, in the opinion of the Commission, primarily focused on meeting technical airworthiness requirements for conducting introductory flights, while placing less emphasis on operational requirements, including the purpose, limitations, and information provided to individuals wishing to fly and become acquainted with aviation activities of the organisation offering such flights. In addition, the OTZ[20] did not define the duration and geographical scope of the flight corresponding to the definition of a “short flight”, which is more precisely regulated in some other EASA Member States, where introductory flights are limited to the aerodrome vicinity.

Aviation organisations holding approvals for conducting introductory flights in Slovenia were left to define independently the scope and duration of individual introductory flights. This enabled the marketing and sale of flights offering competitive overflights of various tourist destinations across Slovenia, which the investigation authority assessed as a deviation from the intended purpose of introductory flights and as an activity more closely resembling commercial air transport.

The investigation further established that providers of introductory flights in Slovenia frequently deviated from the intended purpose and conditions defined in Part-NCO (Regulation (EU) No 965/2012, Annex VII, Part-NCO). Furthermore, the Commission assessed that aviation organisations and their contractual partners marketed so-called sightseeing flights with the option of selecting multiple destinations for operators authorised to conduct introductory flights, which constituted a misleading practice and an activity exceeding the scope of introductory flights, approaching commercial air transport services provided by AOC[21] operators.

[20] https://pisrs.si/pregledPredpisa?id=DRUG4876

[21] https://www.caa.si/aoc.html

Based on these findings, the air accident investigation authority, in accordance with the provisions of Article 5(4) and Articles 17 and 18 of Regulation (EU) No 996/2010 of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation, issued preliminary safety recommendations addressed to the CAA.

Subsequently, the CAA published a new Operational-Technical Requirement[22], which entered into force on 6 April 2025.

On 10 March 2025, the CAA stated:

> We inform you that on 7 March 2025, a revised Operational-Technical Requirement for the conduct of introductory flights was published in the Official Gazette of the Republic of Slovenia No. 14/25. It is available at the following links:
> https://pisrs.si/pregledPredpisa?id=ANJP149
> https://www.caa.si/operativno-tehnicne-zahteve.html

The CAA provided the following explanation for the revised Operational-Technical Requirement for the conduct of introductory flights:

> The Civil Aviation Agency of the Republic of Slovenia received, on 30 January 2025, a letter from the Air, Maritime and Railway Accident and Incident Investigation Service containing preliminary safety recommendations relating to the accident of a Cessna 172 aircraft, registration S5-DLM, which occurred on 17 November 2024 in the settlement of Gančani.
>
> The safety recommendations addressed to the Civil Aviation Agency were as follows:
> **SI-SR003-2025**
> From the date of receipt of this safety recommendation, the CAA shall, within 15 days, temporarily revoke, withdraw or prohibit the conduct of introductory flights in the Republic of Slovenia. The prohibition shall remain in force until 30 April 2025, but not longer than six months from the receipt of this safety recommendation.
> **SI-SR004-2025**
> Within 60 days of receipt of this safety recommendation, the CAA shall carry out a revision of the existing Operational-Technical Requirement (published on 20 February 2021), in order to more precisely define the rules and conditions for conducting introductory flights in the Republic of Slovenia. These conditions must be consistent with the purpose defined in Regulation (EU) No 965/2012, Annex VII, Part-NCO, and must be reasonable for both the provider of introductory flights and potential users, with the aim of ensuring the purpose, quality and safety of introductory flights in the Republic of Slovenia.
>
> It is understood that safety recommendations SI-SR003-2025 and SI-SR004-2025 are substantively and purposefully interconnected; therefore, the Agency adopted a comprehensive approach in defining measures and addressed them jointly. In accordance with safety recommendation SI-SR004-2025, the Agency immediately initiated a revision of the existing Operational-Technical Requirement (OTZ), published on 20 February 2021.
> A significant substantive change compared to the previous regulation is the provision that introductory flights may be conducted with a total flight time limited to 45 minutes and within the vicinity of the aerodrome. The vicinity of the aerodrome is defined as the aerodrome traffic zone and designated training areas. Although Regulation (EU) No 965/2012 and the previously applicable Operational-Technical

[22] https://www.caa.si/informacija-za-javnost-operativno-tehnina-zahteva-za-izvajanje-uvodnih-letov.html

Requirement already clearly stipulated that introductory flights may only be conducted as an ancillary activity of a club or training organisation for promotional purposes and to attract new students or members, the additional provisions on flight duration and location further limit potential misinterpretation of the concept of introductory flights. Introductory flights could therefore not, and cannot in the future, be conducted as "sightseeing flights."
At the same time, the existing Operational-Technical Requirement was revised, particularly in the sections relating to conditions for persons responsible for safety in the conduct of introductory flights (Article 6), pilot licences, experience, training and checks, as well as recent experience (Article 9), and by introducing, as an age-related requirement, the obligation to hold a valid Class 1 or Class 2 medical certificate. In addition, a number of editorial amendments were introduced, mainly to reflect updates to EU regulations, and the forms for approvals to conduct introductory flights (former Annexes 1 and 2) were removed.

The Operational-Technical Requirement entered into force on the thirtieth day following its publication in the Official Gazette of the Republic of Slovenia, i.e. on 6 April 2025. Upon its entry into force, the previous Operational-Technical Requirement for the conduct of introductory flights (Official Gazette of the RS, No. 16/21) ceased to apply.

During the investigation, the Commission assessed that the CAA's response to the preliminary safety recommendations was acceptable and subsequently monitored the progress of the implementation of the measures. At the conclusion of the investigation, the investigation authority assessed that the CAA's measures had been fully implemented.
Following the publication of the new Operational-Technical Requirement, the CAA conducted awareness-raising activities aimed at aviation organisations and their responsible personnel, in the form of safety lectures presenting the regulatory framework for introductory flights and cost-sharing flights[23].

3.4 Analysis of the Purpose of the Flight

In the initial phase of the investigation, considering that the aircraft was owned by the aviation operator LCM, which also holds a CAA approval for conducting introductory flights, communication between responsible personnel of LCM and the pilot was examined in relation to the operational procedures established by the aircraft owner for the conduct of introductory flights in its Operations Manual, last amended by revision No. 27 dated 29 May 2023.

The investigation established that the accident flight was not related to introductory flights conducted by LCM. The pilot did not meet the experience requirements specified in Chapter 3 of the Operations Manual, did not hold authorisation to conduct introductory flights, and did not have an approved flight assignment, which must be obtained from the designated responsible person of LCM during pre-flight preparation (Form No. 3), as required by the Operations Manual.

[23] https://www.caa.si/upload/editor/file/file0bdad734bd17b89.pdf

As a member of LCM, the pilot was entitled, in accordance with prescribed procedures, to rent the aircraft for the purpose of maintaining his pilot qualifications as a holder of a PPL licence.

A further analysis was conducted comparing the accident flight with "cost-sharing flights". Recommendations[24] for the conduct of cost-sharing flights were issued by the CAA in early 2023. These recommendations are no longer applicable, as the CAA has since regulated this area through an Operational-Technical Requirement[25] for cost-sharing flights (Official Gazette of the RS, No. 106/24), which was published after the accident.

Based on the analysis of the CAA recommendations for cost-sharing flights applicable at the time of the occurrence, it can be concluded that the accident flight was not conducted as a cost-sharing flight, as not all required conditions were met, nor was the EASA Code of Conduct[26] complied with, under which both the pilot and all passengers must be informed prior to the flight.

In the case of an aircraft rented by the pilot, the owner or lessor must also be informed (the performance of a cost-sharing flight must be defined as the subject or purpose of the rental agreement), which, according to statements obtained from LCM as the aircraft owner, was not the case in this instance.

3.5 Flight Analysis

Analysis of radar recordings and flight parameter data transmitted by the aircraft transponder at 2-second intervals showed that, by 11:18:17 local time, the aircraft had reached an altitude of 3,800 ft at a position south of the town of Lenart in Slovenske gorice.

At 11:24:49 local time, the flight altitude (abeam the town of Radenci) was 3,100 ft. The aircraft was in level flight with a cruise speed of 95 kt.

A few minutes later, at 11:27:47, the aircraft was flying in the immediate vicinity of Murska Sobota Aerodrome at an altitude of 2,100 ft, with a descent rate of approximately 2 m/s.

[24] https://www.caa.si/upload/editor/file/fileb9d283aeba67c8f.pdf

[25] https://www.uradni-list.si/glasilo-uradni-list-rs/vsebina/2024-01-3339/operativno-tehnicna-zahteva-za-izvajanje-letov-z-deljenimi-stroski

[26] https://www.easa.europa.eu/en/domains/general-aviation/operations-general-aviation/charter-promote-safety-non-commercial-general-aviation

The aircraft then continued to descend steadily, and at 11:29:29, at the point of crossing the A5 motorway between the towns of Rakičan and Lipovci, it was flying in level flight at an altitude of 1,600 ft. Taking into account the terrain elevation of 550 ft, the flight at that location was conducted at approximately 300 m above ground level.

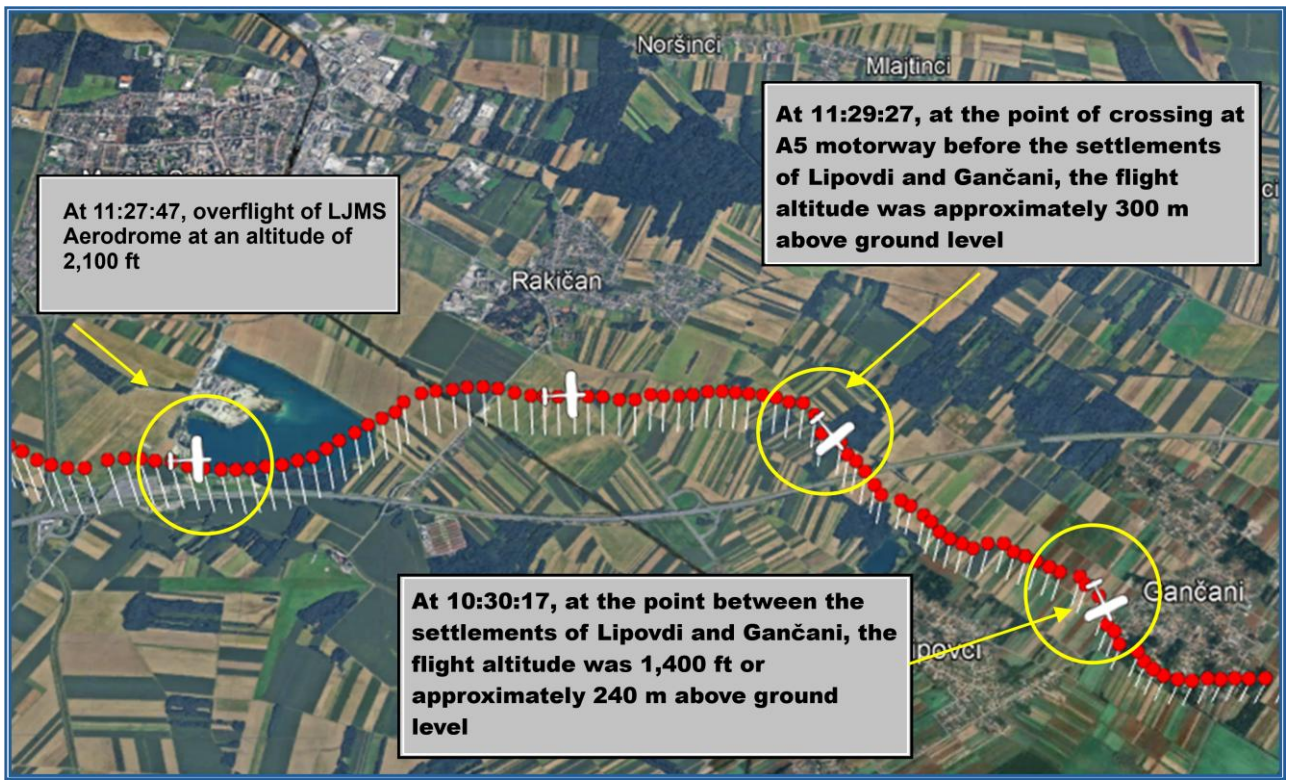

Figure 13: Altitude profile along the route prior to the accident

During the descent, at 11:30:17 the aircraft overflew the western part of the settlement of Gančani in a south-easterly direction of approximately 120°, and then continued for a few seconds in level flight on a heading of 090°, as shown in Figure 13.

At 11:31:05, the aircraft was at an altitude of 1,300 ft, or approximately 250 m above ground level, with a ground speed of approximately 90 kt. After passing the settlement of Gančani, considering the terrain and the vertical and horizontal visibility, the pilot most likely directed his attention in the direction of flight and assessed that he no longer had external visual reference by which to determine the aircraft's position in space.

The terrain over which the aircraft was flying consisted of flat, cultivated agricultural land without infrastructural features. Due to fog and low cloud, the pilot no longer had visual contact with the ground over which he was flying.

At that moment, the pilot most likely decided to return to the area where visual reference with the ground had been available and initiated a 180° turn manoeuvre.

The pilot's decision was most likely based on the guidance provided by the manufacturer in Section 3 of the Pilot's Operating Handbook, which includes instructions for inadvertent entry into clouds and execution of a standard 60-second 180° turn.

3.6 Analysis of the 180° Turn Manoeuvre

The figure below shows flight parameters obtained from the aircraft transponder (radar responder), which transmits data on altitude and speed, position, and aircraft identity to the air traffic controller.

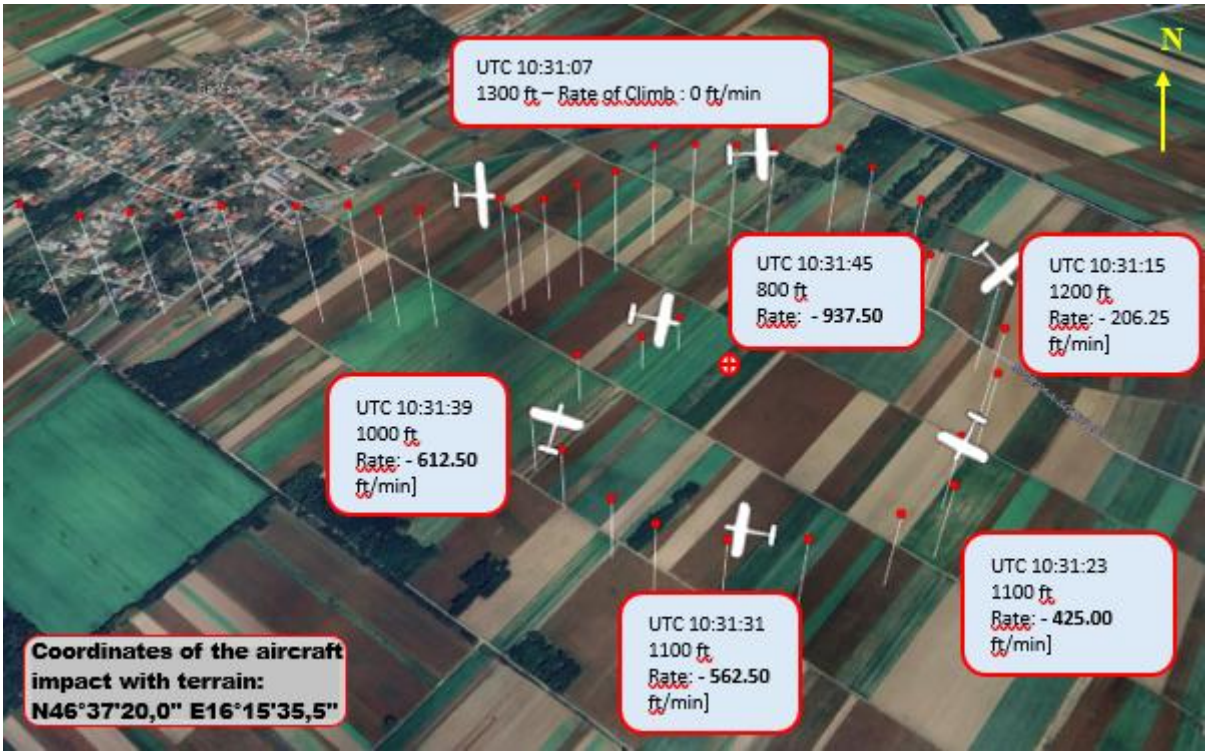

Figure 14: Flight data during the right turn manoeuvre prior to impact with terrain

From the altitude data during the execution of the right turn manoeuvre, it is evident that the rate of descent increased, such that during the 180° turn the aircraft lost approximately 100 m of altitude in 22 seconds.

At 11:31:39 local time, at the last transponder signal point prior to impact with terrain, the aircraft had a ground speed of approximately 90 kt and an increasing rate of descent. At an altitude of 800 ft, or approximately 70 m above ground level, the rate of descent was 937.50 ft/min, which corresponds to approximately 5 m/s. A few seconds after the last transponder signal, the aircraft impacted the terrain.

Analysis of the aircraft trajectory showed that the initiation of the right turn was performed as a coordinated level turn with a bank angle of approximately 30° at a speed of approximately 170 km/h, corresponding to a turn with a radius of approximately 880 m.

Under these flight conditions, the aircraft would complete a full 360° turn in approximately 55 seconds, maintaining a load factor of 1.15 G, with a turn rate of approximately 6.5°/s.
Analysis of flight parameter data and distance travelled indicates that, from the initiation of the right turn, the aircraft changed heading by approximately 180° within 30 seconds and then continued descending in a right turn with a bank angle of 30° to 35° for an additional approximately 7 to 10 seconds before impacting the terrain.

3.7 Human Factors

Statistics[27] on accidents in the general aviation (GA) category show that flights conducted under Visual Flight Rules (VFR) which inadvertently or intentionally enter Instrument Meteorological Conditions (IMC) represent a significant safety risk, resulting in a fatal outcome in approximately 75% of cases. These events are typically associated with loss of control (LOC[28] – Loss of Control) or controlled flight into terrain (CFIT[29] – Controlled Flight Into Terrain).

Pilots who are not trained for instrument flight or do not have sufficient and recent practical experience in instrument flying may face a significantly increased risk of loss of control when entering IMC conditions, as such conditions require flight solely by reference to instruments.
Research and accident analyses indicate that VFR pilots attempt to continue VFR flight into IMC conditions for various reasons, such as:

- Focusing on factors such as time pressure or additional costs due to diversion or delay, often referred to in the literature as “get-home-itis” or “go-home-itis”;
- Limited situational awareness, typically associated with a lack of pilot experience in interpreting changing weather conditions after take-off;
- Overestimation of their ability to control the aircraft in deteriorating weather conditions or underestimation of the risks associated with IMC flight. In some cases, pilots believe that limited instrument training obtained during PPL training is sufficient to manage such conditions;

[27] https://skybrary.aero/articles/inadvertent-vfr-flight-imc

[28] https://skybrary.aero/articles/loss-control

[29] https://skybrary.aero/articles/controlled-flight-terrain-cfit

- Internal (personal) or external (social) pressures that may influence the decision to continue the flight. For example, the presence of passengers may create a sense of responsibility in the pilot to reach the destination on time.

3.7.1 Pilot Decision-Making

The collected information and data do not allow for a complete reconstruction of all facts and circumstances that may have influenced the pilot's decision to conduct the flight at low altitude and in conditions of significantly reduced visibility.

It was established that the pilot had, over a longer period, coordinated the execution of a "sightseeing flight" with the passengers, which had been intended as a gift for one of them. The extended planning period and several previous unsuccessful attempts to carry out the flight, together with the expectations of the passenger's friends—who, on the day of the occurrence, were informed via social media about the potential arrival and overflight of the aircraft above the planned location—may have represented additional factors influencing the pilot's decision-making during the pre-flight phase.

During the continuation of the flight, with the gradual descent from departure towards the home area, the same factors may have influenced the pilot's assessment of the conditions and subsequent decision-making.

In the final phase of the flight, immediately prior to the accident, based on the available data it cannot be reliably determined whether effective options were available to alter the course of events.

3.7.2 Human Factors Context

The environment in which the flight was planned and conducted was demanding and variable. The combination of all factors – including:

- meteorological changes (differences in weather conditions between departure and arrival at the planned location);
- geographical characteristics of the area (overflight of a specific area with dense fog);
- time-related circumstances and the nature of the flight (a sightseeing flight with an overflight of the home area)

may have represented additional circumstances that influenced the course of events and decision-making during the flight.

It should be emphasised that this was an interplay of multiple factors, some of which were not directly under the pilot's control. The combination of these circumstances created conditions in which continued management of the situation was significantly more difficult.

4 CONCLUSIONS

4.1 Findings

- The aircraft had a valid airworthiness status and all required approvals for flight;
- The pilot held a valid PPL licence – authorising flight with single-engine aeroplanes in visual meteorological conditions (VMC);
- The privileges of the licence were exercised with a valid Class 2 medical certificate. Based on the available data, the pilot's medical condition did not influence the course of events;
- The investigation did not identify any evidence of malfunction of the aircraft, engine, propeller, or control system. There were also no indications of any pre-impact system failure or limitations affecting normal operation;
- Meteorological conditions on the day of the occurrence were suitable for VFR/VMC flight, but not in the area where the planned flight altitude was up to 1,000 ft above ground level. Weather conditions, due to dense fog below 300 m above ground level in the area of flight, contributed to the accident;
- During the gradual descent, the aircraft entered an area of low cloud and fog where external visual reference was not available;
- The pilot did not hold an instrument rating (IR) and had no experience in flying in IMC conditions;
- The pilot's authorisation for flight in controlled airspace (CVFR) had expired on 25 September 2023;
- The pilot conducted a right turn manoeuvre at low altitude without external visual reference, which resulted in loss of control of the aircraft's attitude and subsequent impact with terrain;
- The last radar contact (secondary surveillance radar position return) with the aircraft was at 11:31:57 local time (10:31:57 UTC);
- The pilot had previously coordinated and arranged the flight with friends. The aircraft owner was not informed about the circumstances of the preparation and execution of the flight;
- It was established that the aircraft owner did not systematically familiarise club members with all rules and responsibilities regarding aircraft rental and the intended use of aircraft.

4.2 Causes of the Accident

4.2.1 Direct Cause

Impact of the aircraft with terrain following loss of control of the aircraft's attitude during a manoeuvre at low altitude in conditions without external visual reference.

4.2.2 Contributing Causes

Intentional or unintentional entry into an area of low cloud base at low altitude, which was not sufficiently assessed in relation to the desire to reach the intended objective. This led to the flight being initiated and continued despite the lack of both legal and practical conditions for conducting flight under visual flight rules.

4.2.3 Contributing Factors

The accident occurred in circumstances where the pilot exceeded his own capabilities. Lack of experience and the assumption of responsibility in the role of pilot-in-command, with passengers who had their own expectations, may have caused significant stress for the pilot and difficulties in situational awareness and management.

5 SAFETY RECOMMENDATIONS

In the initial phase of the investigation, safety issues related to the conduct of introductory flights were identified. Safety recommendations were issued (see section 3.3 of this report for details), which were fully implemented by the CAA during the course of the investigation.

The hazards associated with conducting flights under Visual Flight Rules (VFR) in Instrument Meteorological Conditions (IMC) are already subject to professional consideration and awareness activities within aviation organisations and aeroclubs in the Republic of Slovenia. Based on the findings of the investigation and the measures already implemented, the Commission does not issue additional safety recommendations.

Notwithstanding the above, aviation organisations and other relevant stakeholders may continue to carry out preventive safety activities aimed at reducing risks associated with inadvertent entry into IMC during VFR flights.

During the investigation, the Commission also identified a broader safety aspect addressed by certain national aviation authorities within the European Union, namely the occurrence of illegal or improperly organised activities related to flights with light aircraft in general aviation (GA), which may exhibit characteristics of commercial operations. There is a fine line between commercial

operations for remuneration and cost-sharing flights; therefore, it is important that passengers are adequately informed about the nature of such flights and the rights associated with them.

As part of awareness-raising activities concerning the safety of non-commercial general aviation operations, EASA has published the informational document *EASA Leaflet 02* (2017, updated 2018), addressing European rules for non-commercial air operations with aeroplanes and helicopters under Commission Regulation (EU) No 965/2012.

EASA has also published a Charter for the promotion of safety in non-commercial general aviation flights with light aircraft, aimed at increasing awareness of safety risks in general aviation. The promotion and use of such safety initiatives may contribute to further improvement of the safety culture in general aviation.

Toni STOJČEVSKI
Head of Unit
Investigator in Charge

ANNEXES

Annex 1: Chapter 3 of the Operations manual for the Conduct of Introductory Flights – LC Maribor

Operator requirements for personnel conducting introductory flights

3. OSEBJE, KI OPRAVLJA UVODNE LETE IN ODGOVORNE OSEBE

3.1. Pilot

3.1.1 Vodja letala pri uvodnem letu je lahko pilot, ki izpolnjuje naslednje pogoje:.

- imeti mora veljavno dovoljenje pilota LAPL,PPL ali višjega ranga,
- imeti mora veljaven rating za ustrezen tip / razred zrakoplova,
- član Letalskega centra Maribor
- izpolnjuje naslednje zahteve glede naleta na letalih tipa general aviation:

Licenca	LAPL, PPL	CPL ali ATPL in FI(A)
Skupni nalet	200 ur	200 ur
PIC	100 ur	100 ur
Preletov kot PIC	20 ur	20 ur
Izkušnje na določenem tipu zrakoplova	10 ur in 10 vzletov	10 ur in 10 vzletov
Nalet v zadnjih 12 zaporednih mesecih	10 ur	10 ur
Osnovno usposabljanje in preverjanje	Vsaj en let v skladu z zahtevami NCO Uredbe komisije (EU) št. 965 / 2012 in letenje z max. št. potnikov, ter ostala področja, ki vključujejo usposabljanje za CPL licenco v skladu z Uredbo komisije (EU) št. 1178/2011)	Vsaj en let v skladu z zahtevami NCO Uredbe komisije (EU) št. 965 / 2012 in letenje z max. št. potnikov, ter ostala področja, ki vključujejo usposabljanje za CPL licenco v skladu z Uredbo komisije (EU) št. 1178/2011)
Praktično preverjanje	Vsako leto	Vsako leto ali vsaki 2 leti na podlagi skupnega naleta vsaj 20 ur na predmetnem razredu ali tipu zrakoplova v preteklem letu in vsaj 10 izvedenih uvodnih letih v preteklem letu.
Prekinitve letenja več kot 90 dni	Praktično preverjanje	Praktično preverjanje
Starost	Manj kot 70 let	Manj kot 70 let

Annex 2: Altitude profile of flight S5-DLM during the final minutes prior to the accident