



THE REPUBLIC OF CROATIA

Air, Maritime and Railway Traffic Accident Investigation Agency

Air Traffic Accident Investigation Department

Class: 343-08/25-02/10
No: 699-04/1-16
Zagreb, 12 October 2026

FINAL REPORT

ON THE ACCIDENT OF THE AIRCRAFT Air Tractor 802A, OR-2025

Krivi put, City of Senj, 13 November 2025



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OCCURENCE INFORMATION



Type of the occurrence:	Accident
Date:	13 November 2025
Local time:	16:37
Place:	Krivi put, near Senj
Type of the aircraft:	Aeroplane
Manufacturer / model:	Air Tractor 802A
Country of registration:	Republic of Türkiye
Registration:	OR-2025
Owner:	Ministry of Agriculture and Forestry of the Republic of Türkiye
Operator:	Ministry of Agriculture and Forestry of the Republic of Türkiye
Number of persons on board:	1
Injuries:	1 fatality
Damage to the aircraft:	Destroyed

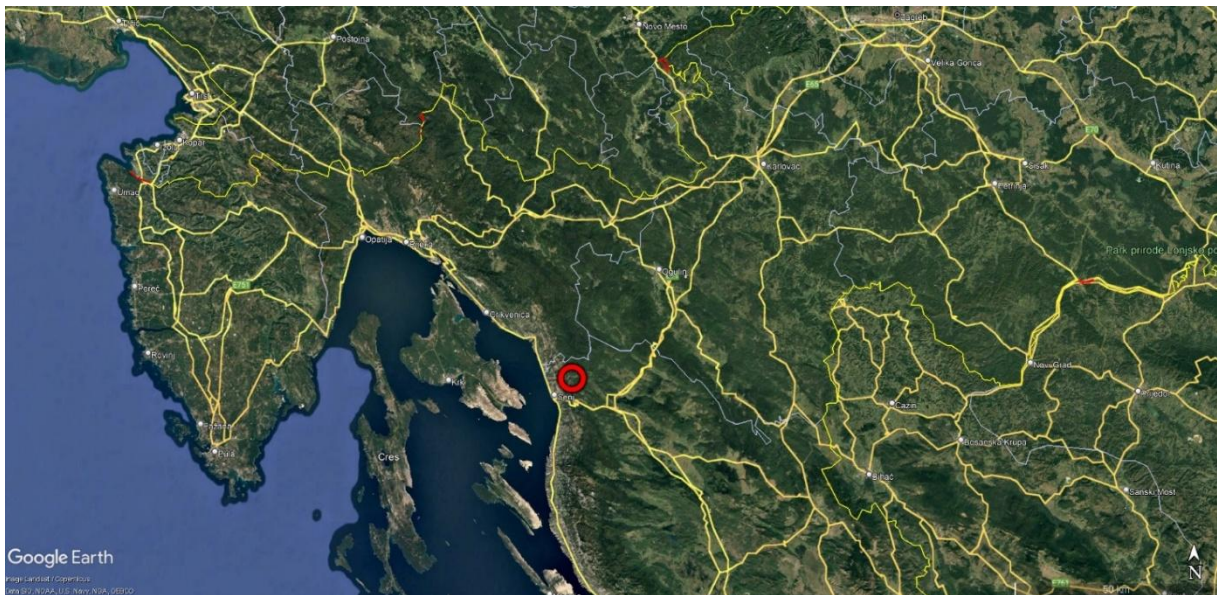


Figure 1 – accident site marked by a red circle

INVESTIGATION

AIA received notification of the missing aircraft from the Ministry of the Interior's Operational Communication Centre (OKC MUP) and from Croatia Control. A search and rescue operation was launched, and the aircraft wreckage was found later that evening.

The aircraft was destroyed by impact forces and the post-impact fire and the pilot was fatally injured.

AIA opened an investigation, and the on-site investigation was carried out the following day, i.e. on 14 November 2025.

On 15 November 2025, air accident investigators from the Turkish investigation authority arrived in Croatia. The accident site was inspected together with them, and in the following days, the details of



mutual cooperation during the further course of the investigation were agreed in accordance with international regulations.

Thirty days after the accident, in accordance with the provisions of ICAO Annex 13, AIA issued a 'Preliminary Report' outlining information on the occurrence and the findings from the early stages of the investigation.

Upon completion of the investigation, AIA issued this Final Report.

SUMMARY

On 13 November 2025, two Turkish Air Tractor aircrafts took off from Rijeka Airport (LDRI) on a VFR flight with the intention of landing at Zagreb International Airport (LDZA). There was one person – the pilot – on board each aircraft.

Due to fog in the Zagreb area, they were unable to land at Zagreb International Airport. They turned around before reaching Zagreb and headed back towards Rijeka Airport on the island of Krk.

The flight path led across Gorski Kotar and the mountain ridge separating inland Croatia from the coast, which was enveloped in a band of cloud. The aircraft entered the cloud band in order to fly through it. In conditions without the visibility required for VFR flight, one of the two aircraft struck the mountain ridge. The aircraft was destroyed by the impact and the fire that followed, and the pilot was fatally injured.

The cause of this accident was the aircraft entering conditions without the visibility required for VFR flight.

AIA did not issue any safety recommendations.

1. FACTS AND INFORMATION

1.1. HISTORY OF THE FLIGHT

On the day before the accident, 12 November 2025, two Air Tractor AT-802A aircrafts, registrations OR-2025 and OR-2024, flew from Türkiye to Tirana, Albania, and then from Tirana to Rijeka Airport (ICAO code – LDRI).

The operator of both aircraft was the Ministry of Agriculture and Forestry of the Republic of Türkiye, and the purpose of their arrival in Croatia was to undergo certain maintenance work at the Aircraft Technical Centre in Zagreb.

The following day, i.e. 13 November 2025, at approximately 15:35 local time (15:35 LT), both aircraft took off from Rijeka Airport on a VFR flight with the intention of landing at Zagreb International Airport (MZLZ). They came close to Zagreb International Airport but were unable to land due to fog, which prevented a visual landing. They turned around before reaching Zagreb and headed back towards Rijeka Airport.

The flight from Rijeka Airport towards Zagreb proceeded without difficulty, as did most of the return flight from Zagreb towards Rijeka Airport. They flew under visual flight rules, maintaining visual contact with each other and a separation of approximately half an NM. The aircraft in question was in the lead

and was followed by the second aircraft. The pilot of the aircraft in question maintained communication with air traffic control, while the pilots of the two aircraft communicated with each other by radio on a separate frequency.

The return flight proceeded without difficulty until the mountain ridge separating inland Croatia from the coast. The ridge was enveloped in cloud, and the pilots decided to fly through it and emerge from the cloud on the coastal side, where visual meteorological conditions again prevailed.

Thus, both aircraft briefly found themselves in conditions that did not meet the criteria for visual flight.

The pilot of the second aircraft stated that, upon emerging from the cloud on the coastal side, he did not see the aircraft in question, which should have been ahead of him. He contacted air traffic control at Rijeka Airport, which replied that the aircraft in question was no longer visible on radar and that only one of the two aircraft could be seen visually approaching the airport.

The second aircraft landed safely at Rijeka Airport at approximately 16:50 LT.

A search and rescue operation was launched, and the wreckage of the aircraft in question was found the same day in the mountainous area above the city of Senj.

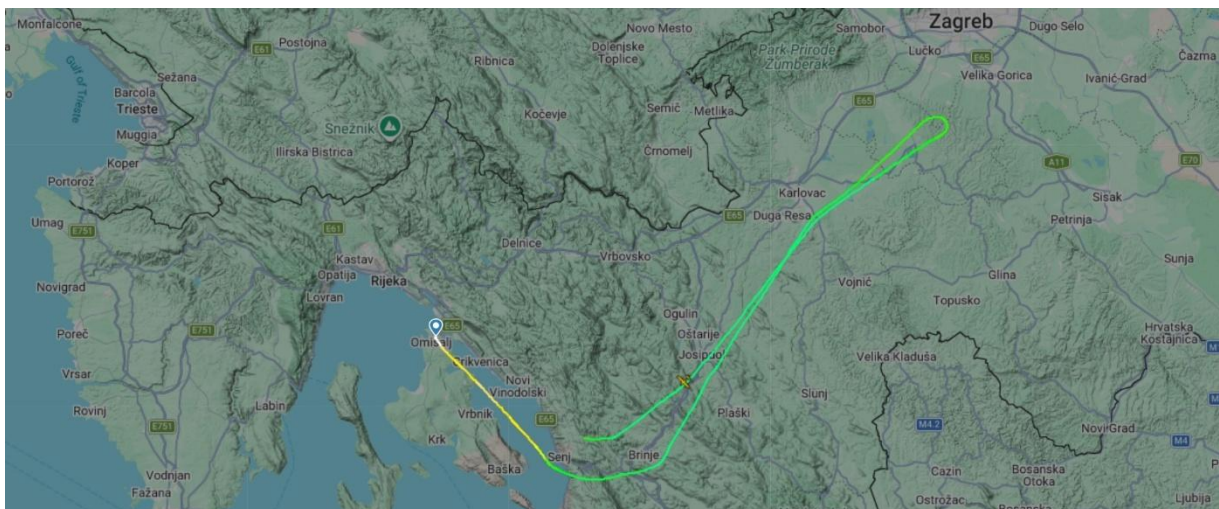


Figure 2 – flight path

1.1.1. Flight details

Based on the radar recording and the recording of communications between the pilot and air traffic control, the elements describing the flight in greater detail are set out below in chronological order. The first part of the flight, from take-off at Rijeka Airport at 15:35 LT until the start of the descent towards Zagreb International Airport, proceeded normally, without any elements of relevance to this investigation. The call sign of the aircraft in question was 'Orman 25', and that of the second aircraft was 'Orman 24'.

15:35 LT – Both aircraft took off from Rijeka Airport towards Zagreb International Airport

15:58 LT – Pilot 1 (the pilot of the aircraft in question – Orman 25) established communication with air traffic control at Zagreb International Airport. The controller provided information on the pressure and runway in use and asked the pilot about his intentions. The pilot replied that he intended to land at



Zagreb International Airport, whereupon the controller provided information on the meteorological conditions at the airport – mist and cloud at 200 ft – and requested and received confirmation from the pilot that the flight was being conducted under VFR

16:02 LT – 'Orman 25' began descending towards Zagreb International Airport

16:02 LT – the controller informed Pilot 1 that visibility at Zagreb International Airport was deteriorating and that a visual landing could not be approved, and asked whether the pilot could switch to IFR flight

16:04:35 LT – the controller repeated that Zagreb Tower could not approve the landing and asked the pilot about his further intentions. Pilot 1 replied that he would continue towards the airport for approximately another 5 miles and that, if they could not see the runway, they would turn back. The controller instructed him not to descend below 3,000 ft

16:07 LT – the controller asked the pilot to confirm that he was in VMC, to which Pilot 1 replied in the affirmative and stated that he had visual contact with the ground. The pilot further stated that, if they could not see the runway, they would turn back towards the airport from which they had taken off (Rijeka Airport)

16:10 LT – the controller instructed Pilot 1 to turn towards the 'Kotor' point (back) and asked which altitude he requested for the return to Rijeka. An altitude of 7,500 ft was requested and approved

16:11 LT – 'Orman 25' made a right 180° turn and headed back. At that point, he was at 3,025 ft and began climbing

16:21 LT – 'Orman 25' reached an altitude of 7,000 ft and maintained approximately that altitude until the start of the descent towards Rijeka Airport

16:27 LT – Zagreb Radar transferred communication to Pula Radar

16:29 LT – 'Orman 25' began descending. At that point, it was above the city of Josipdol, which lies at an elevation of 340 m.

16:31 LT – Pilot 1 established contact with Pula Radar and reported that he was beginning the descent

16:34 LT – 'Orman 25' began a steeper descent. At that point, it was at an altitude of 6,075 ft above the village of Vodoteč, which lies at an elevation of approximately 590 m (1.936 ft). The average rate of descent over the following 3 minutes was 950 ft/min (4.826 m/s).

16:36 LT – Pula Radar transferred communication to Rijeka Airport air traffic control

16:36:39 LT – Pilot 1 informed Rijeka Airport air traffic control that they were approaching at approximately 20 miles from the airport and were descending

16:36:48 LT – the controller issued landing instructions for runway 32, but received no reply

16:36:56 LT – last radar record: altitude 2,800 ft (853 m); speed 114 kt; heading 265

16:42 LT – the controller called Orman 25 again, without response. The pilot of the second aircraft – Orman 24 – responded and stated that he had lost visual contact with the first aircraft and was unable to establish radio contact with it. The controller replied that he could see Orman 24 but could not see the first aircraft, Orman 25. Orman 24 was then approximately 16 miles from the airport.

16:46 LT – the controller informed Orman 24 that the first aircraft was no longer visible on radar and asked whether he could return towards its presumed position to check what had happened. Pilot 2

replied that he had lost Orman 25 in the cloud, where he could not see it. Pilot 2 and the controller exchanged several further sentences considering the possible reasons for Orman 25's disappearance. At that point, Orman 24 was 6 miles from the airport, and both Pilot 2 and the controller focused on the landing.

16:48 LT – Orman 24 was on final approach, and the controller issued landing instructions – runway 32, no wind

16:50 LT – Orman 24 landed

16:52 LT – Pilot 2 and the controller continued communicating about the disappearance of Orman 25 and attempted to contact Pilot 1 by mobile phone. Pilot 2 provided the approximate coordinates of Orman 25's presumed disappearance location

16:56 LT – the controller forwarded the available information to the relevant services

1.2. INJURIES

Injuries	Crew	Passengers	Other
fatal	1	0	0
serious	0	0	0
minor / none	0	0	0

1.3. DAMAGE TO THE AIRCRAFT



Figure 3 – wreckage at the accident site

Following the impact with the ground, the aircraft in question was completely destroyed by mechanical forces and fire.

The rear part of the fuselage, the floats and the wings were destroyed by mechanical forces. The vertical stabilizer remained almost undamaged.

The front part of the fuselage, including the cockpit, engine compartment and the parts of the wings adjacent to the fuselage, was destroyed not only by mechanical forces but also by fire.



Figure 4 – front part of the wreckage

Three blades of the five-blade propeller were found beneath the front part of the fuselage, detached, deformed and covered in soot.

The hub with one propeller blade was found approximately twenty metres to the right of the aircraft's direction of arrival. The blade remained attached to the hub. It showed deformation indicating that the propeller had been rotating.



Figure 5 – hub with one propeller blade

1.4. OTHER DAMAGE

The accident site is located on a slope covered with low deciduous forest. A narrow paved road runs immediately below the aircraft crash site.

As a result of the fire in the front part of the aircraft, vegetation in the immediate vicinity of the fire was burned. Several smaller trees were broken at the impact site itself. The fire did not spread.

1.5. PERSONAL INFORMATION

The information on the pilot who was on board the aircraft in question (Pilot 1), together with the information and relevant points from the statement of the pilot operating the second aircraft (Pilot 2), is set out below:

1.5.1. Pilot 1

A male person, a Turkish citizen born in 1986. He held a valid CPL(A) licence issued in 2013 by DGCA Turkey. His medical certificate was also valid.

In 2023, Pilot 1 completed AT-802 SET SEA type rating training for firefighting operations. The training took place in Spain and included theoretical instruction, simulator training and flight training. Part of the flight training was carried out in an actual firefighting operation.

During his flying career, Pilot 1 flew the following aircraft: Diamond DA-20; Diamond DA-42; Airbus 319/320; Embraer 170/190; and Cessna 208.



By the date of the accident, he had accumulated 3,583 flight hours, of which 545 hours were on the AT-802 type.

1.5.2. Pilot 2

A male person, a Turkish citizen born in 1977. He flies for the Ministry of Agriculture and Forestry of the Republic of Türkiye in firefighting operations and previously flew as a military pilot.

Statement

For the purposes of this investigation, he described the course of the flight in question. He stated that, after taking off from Rijeka Airport, they climbed to 6,500 ft and flew above the clouds enveloping the mountain ridge. The conditions above Gorski Kotar were good, and they did not lose visual contact with the ground. Near Zagreb, they were at 3,000 ft. They approached Zagreb International Airport to within approximately 8 NM and could see the runway lights through the fog. The horizontal visibility at the airport was 400 m at that time, and air traffic control instructed them to return.

They turned the aircraft back along the same route and climbed to 7,500 ft. He stated that they intended to reach the coast and then begin descending. They saw a 'gap' in the band of cloud enveloping the mountain ridge above the coast and concluded that they would pass through it. At that point, they were 5 to 6 NM from the coast.

Before entering the clouds, they descended to approximately 5,000 ft, while continuing to maintain visual contact with each other. The first aircraft (the aircraft in question) was approximately half an NM ahead. They entered the clouds at approximately 16:25 – 16:30 LT and flew through them for approximately 2 minutes. There was some turbulence. As expected, upon entering the clouds they lost visual contact with each other. Pilot 2 stated that, when he emerged from the clouds, he was above the sea at an altitude of 3,000 ft. He did not see the first aircraft (the aircraft in question), which should have been in front of him. He attempted to contact it by radio but received no reply.

At 16:42, he contacted air traffic control at Rijeka Airport and informed them of the situation. Air traffic control replied that they could not see the aircraft in question either. He reported the last point at which he had seen the first aircraft. He landed at Rijeka Airport at 16:50 LT.

1.6. AIRCRAFT INFORMATION

1.6.1. Air Tractor 802A

Manufacturer:	Air Tractor (USA)
Type:	AT-802A
Aircraft S/N:	802A-0997
Year of manufacture:	2023
Engine:	Pratt & Whitney PT6A-67F (<u>turboprop</u>)
Engine S/N:	PCE-RZ0332
Propeller:	Hartzell HC-B5MA-3D/M11681NS
Registration:	OR-2025
Owner:	Ministry of Agriculture and Forestry of the Republic of Türkiye



Operator:	Ministry of Agriculture and Forestry of the Republic of Türkiye
Crew:	one pilot
Passengers:	none
Empty weight:	3.062 kg
MTOW:	7.257 kg
Maximum fuel capacity:	961 L (254 US gal)
Payload:	4.195 kg
Tank capacity:	3.028 L (800 US gal)

Maximum speed:	181 kt (335 km/h)
Cruise speed:	166 kt (308 km/h) at 8.000 ft (2.438 m)
Stall speed:	79 kt (146 km/h) (flaps down)
Climb rate:	780 ft/min (3,96 m/s) at full load
Range:	1.300 km (700 NM)
Maximum altitude:	13.000 ft (4.000 m)
Take-off ground roll:	2.000 ft (610 m) at full load
Landing roll:	400 m

Aircraft dimensions:	length – 10,95 m
	wingspan – 18,06 m
	height – 3,89 m
	wing area – 37,25 m ²

Total flight time:	201 hours
Number of take-offs and landings:	1.067

The Air Tractor AT-802A is a utility aircraft intended for agricultural and firefighting purposes and can also be used for military purposes. It is an all-metal, low-wing aircraft with a tailwheel. It is powered by a single turbine engine and a five-blade propeller. It has been manufactured in the USA since 1990.

For firefighting purposes, it can be equipped with amphibious floats allowing take-offs and landings on both water and hard surfaces (the 'Fire Boss' variant). As a utility aircraft, the Air Tractor has no passenger-carrying capacity. It is produced in single-seat and two-seat versions. The aircraft in question was a single-seat aircraft designed to accommodate only the pilot.

The aircraft in question was properly maintained and met all prescribed requirements for operational use. None of the findings from this investigation indicate any possible technical factors that could have contributed to this accident.



Figure 6 – Air Tractor AT-802A Fire Boss, registration OR-2025 (*photograph used with the author's permission – Kayra Duyan*)

1.7. METEOROLOGICAL INFORMATION

1.7.1. Description of the meteorological situation

At the time of the accident, south-eastern Europe was under the influence of a broad anticyclone that supported prolonged stable weather without precipitation. In such circumstances, fog and low cloud can be expected in continental Croatia during winter and late autumn.

This situation had persisted for days and changed very little. Fog formed in low-lying areas and could dissipate during the day, only to form again in the afternoon as solar radiation weakened. The mountain ridge forming a natural barrier between inland Croatia and the coast had for days been enveloped in low cloud extending to an altitude of approximately 1.500 m ASL.

The satellite image (Figure 7) shows cloud cover over Croatia at the time of the accident. This situation had persisted for days. A band of cloud is visible along the mountain ridge near the coast. The red dot marks the accident site. Fog formed in some inland areas.

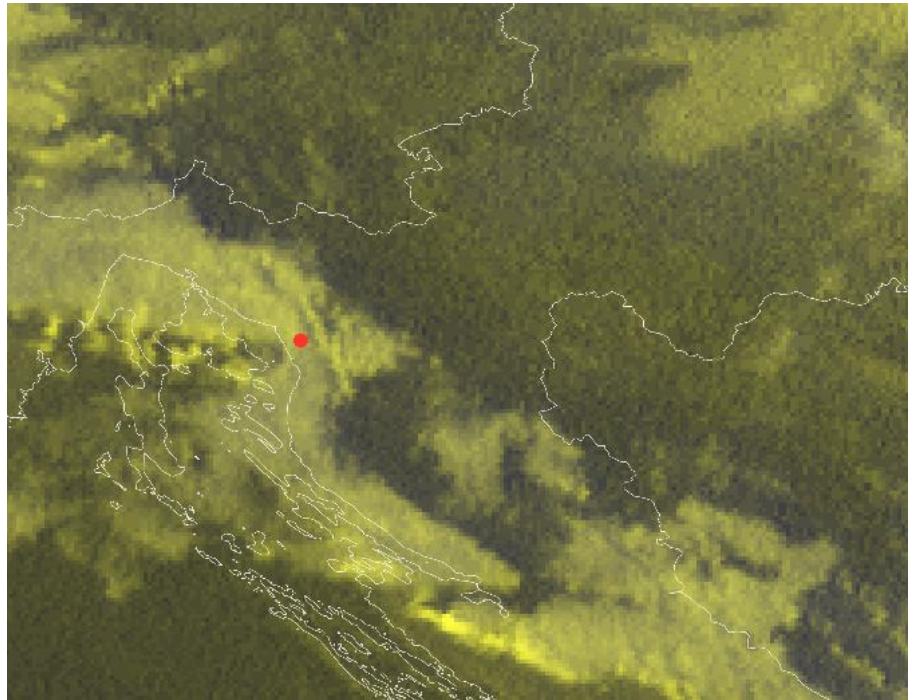


Figure 7 – satellite image of cloud cover over Croatia at the time of the accident

Winds were predominantly westerly and generally light. The highest wind speeds occurred directly above the mountain ridges, where the terrain caused the airflow to accelerate. This acceleration occurred in the lower layers above the ridge (Figure 8). At higher altitudes (above 2.000 m ASL), wind speed decreased with altitude (Figure 9). At an altitude of 3.000 m ASL, the terrain no longer had any effect, and the wind speed at that altitude was uniform and lower than in the lower layers above the mountain ridge (Figure 10).

In addition, the airflow in the layer above the ridge also had a vertical component. On the leeward side, this component was downward. At an altitude of 1.500 m ASL, it amounted to as much as -3 m/s (Figure 11), and it may have been even greater in the lower layer.

All images show conditions reconstructed using a numerical model and relate to 16:30 LT on the day of the accident. The accident site is marked by a red dot.

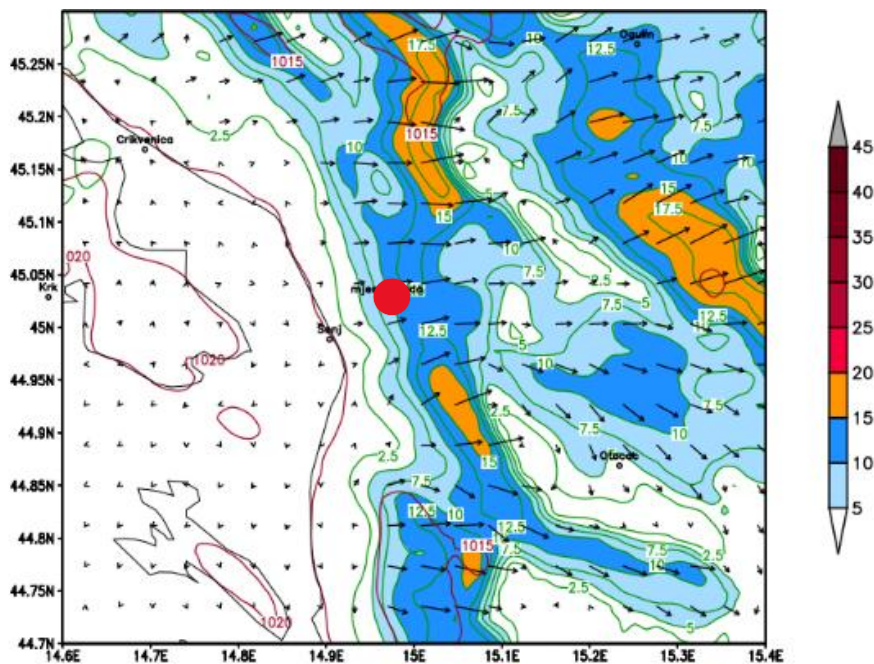


Figure 8 – wind direction and speed (m/s) in the layer 80 m above the ground. The accident site is marked by a red dot

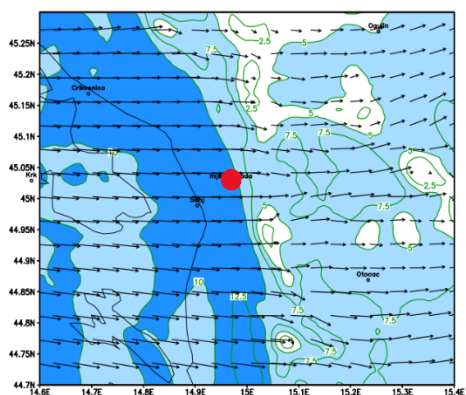


Figure 9– wind direction and speed (m/s) at 2.000 m

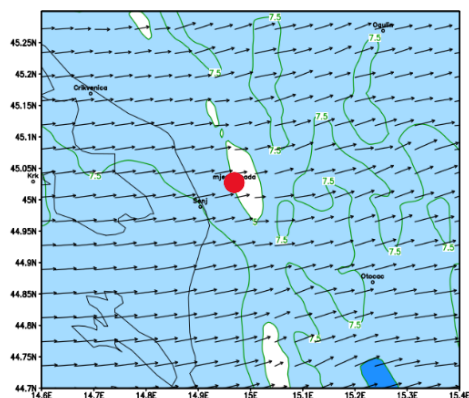


Figure 10 – wind direction and speed (m/s) at 3.000 m

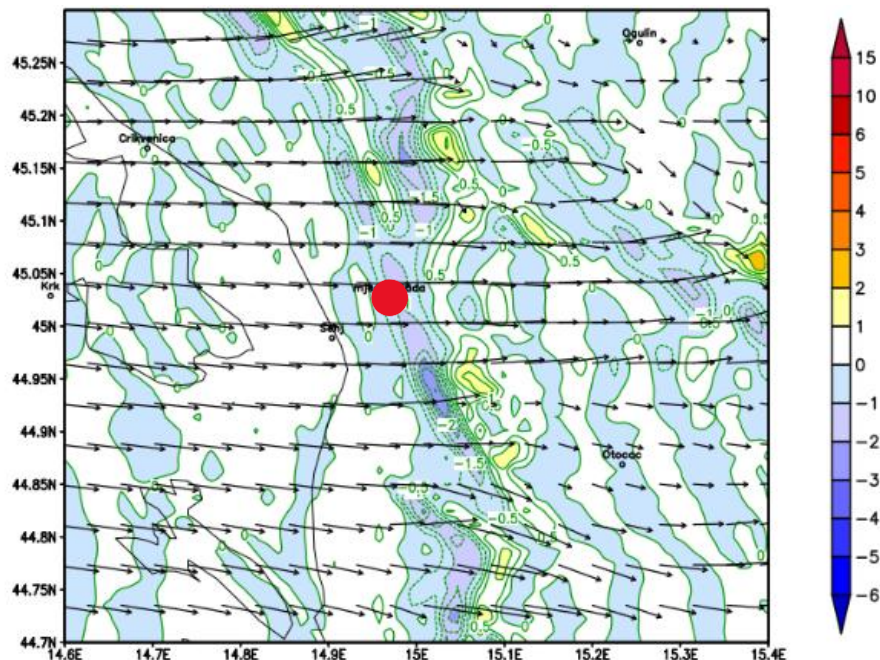


Figure 11 – vertical wind speed at an altitude of 1.500 m

1.7.2. Meteorological conditions at Rijeka Airport

The METAR data for 16:30 LT, i.e. approximately the time of the accident, are as follows:

METAR LDRI 131530Z 11004KT 9999 FEW026 BKN040 15/13 Q1023

The METAR data for Rijeka Airport show that the wind at the airport was 4 kt from 110° (east-south-east). Visibility was good, 10 km or more. There were up to 2/8 clouds at 2.600 ft and 4 to 7/8 clouds at 4.000 ft above the airport. The air temperature was 15°C and the dew point 13°C. The pressure (QNH) was 1,023 hPa.

The METAR data for the other reporting times show that the conditions did not change significantly during the day and were favourable for visual flight operations at this airport.

1.7.3. Meteorological conditions at Zagreb International Airport

The METAR data for 15:30 LT, i.e. approximately the time at which the aircraft took off from Rijeka Airport towards Zagreb International Airport, are as follows:

METAR LDZA 131430Z 06003KT 030V100 9999 FEW002 09/07 Q1021 NOSIG

The METAR data show that, when the two aircraft in question took off from Rijeka Airport towards Zagreb, the wind at Zagreb International Airport was 3 kt, varying in direction from 30° to 100°, with an average direction of 60°. Visibility was above 10 km, with some cloud (up to 2/8) at an altitude of 200 ft AGL. The air temperature was 9°C and the dew point 7°C. The pressure (QNH) was 1.021 hPa.

The METAR data for 16:00 LT, while the aircraft were flying towards Zagreb International Airport, are as follows:



METAR LDZA 131500Z 04003KT 320V100 8000 3000NE R22/1400N PRFG FEW002 08/07Q1021
BECMG FM1600 2000 BCFG BKN002

When the two aircrafts in question were flying towards Zagreb, the wind at Zagreb International Airport was 3 kt, varying in direction from 320° to 100°, with an average direction of 40°. Visibility was of 8 km, 3 km towards the north-east and 1.400 m on runway 22. Partial fog was present at the aerodrome, with few clouds at 200 ft AGL.

The air temperature was 8°C and the dew point 7°C. The pressure (QNH) was 1.021 hPa. The forecast trend was for visibility to decrease to 2.000 m, with patches of fog and 5/8 to 7/8 cloud at 200 ft.

The METAR data for 16:30 LT, while the aircraft were flying back towards Rijeka Airport after turning around before reaching Zagreb International Airport, are as follows:

METAR LDZA 131530Z VRB02KT 0300 R04/0450U R22/0900D FG BKN002 07/06 Q1021NOSIG

The wind was variable at 2 kt. The minimum visibility was 300 m. Visibility on runway 04 was 450 m, while visibility on runway 22 was 900 m with a decreasing trend. There were 5/8 to 7/8 low clouds at 200 ft AGL and fog. The air temperature was 7°C and the dew point 6°C. The pressure (QNH) was 1,021 hPa.

1.7.4. Meteorological conditions along the flight route

The conditions for VFR take-off and landing at Rijeka Airport were favourable.

The conditions along the route to Zagreb International Airport and back were favourable for VFR flight, except in the cloudy area over the mountain ridge between the coast and inland Croatia.

The conditions for a VFR landing at Zagreb International Airport were favourable when the aircraft in question took off from Rijeka Airport but deteriorated during the flight and approach to Zagreb International Airport.

1.8. COMMUNICATION

The pilot of the aircraft in question ('Orman 25') communicated with air traffic control and communicated with the pilot of the second aircraft ('Orman 24') by radio on a separate frequency.

All relevant and available details of the communication have already been set out in the description of the flight, section 1.1.1.

1.9. FLIGHT RECORDERS

Neither the aircraft in question nor the second aircraft in the formation was equipped with a flight data recorder (FDR) or a cockpit voice recorder (CVR).

1.10. AIRPORT INFORMATION

Rijeka Airport (LDRI) is located on the island of Krk, 17 km south-east of the city of Rijeka. It is a civilian airport equipped to accommodate aircraft of all sizes in international and domestic traffic. In terms of



traffic volume, it is the sixth busiest airport in Croatia, with most traffic occurring during the summer tourist season.

The airport has one asphalt runway, 2.500 m long and 45 m wide, with orientation 14/32, at an elevation of 85 m (278 ft).

At the time of the take-off, flight and landing of the aircraft in question, traffic at Rijeka Airport was light.

1.11. OPERATOR INFORMATION

The operator of the aircraft in question is the Ministry of Agriculture and Forestry of the Republic of Türkiye. The aircraft is used for firefighting.

1.12. INFORMATION ON THE CRASH AND REMAINS OF THE AIRCRAFT

Description of the terrain

The aircraft impact site is located on a gentle slope with a gradient of approximately 15°, approximately 20 m below the hill ridge. The terrain is covered with dense deciduous vegetation up to approximately ten metres high. The ground is earthy, with stones and smaller rocks. A narrow paved road, on which there is generally no traffic, runs immediately below the impact site.

Position of the wreckage

The aircraft wreckage was found with its front part on the upper part of the slope. The front and central parts of the aircraft were completely burned. The tail section, which was the lowest part of the wreckage, was the least damaged and was not affected by the fire. The floats were located beneath the central and rear sections of the fuselage and were significantly damaged. Smaller broken parts of the aircraft were scattered around. The hub with one propeller blade had been thrown approximately twenty metres from the central part of the wreckage to the right of the aircraft's longitudinal axis. Although the aircraft had completely broken apart, most parts were located within a relatively confined area.

Damage to vegetation

The vegetation around the area where the aircraft burned was burned or scorched. Some vegetation was also broken at the crash site itself and along the aircraft's direction of arrival. The fire did not spread, and the overall damage to vegetation was therefore not extensive.

The damage to vegetation (broken branches) shows that the aircraft approached from approximately the east immediately before the impact, and the wreckage was oriented in the same direction. Based on this damage to the vegetation and the traces on the ground, it was concluded that the aircraft approached at a shallow angle.

1.13. SEARCH AND RESCUE

After the aircraft in question disappeared from radar at 16:37 LT, the air traffic controller at Rijeka Airport and Pilot 2 in the second aircraft attempted to establish contact with it. Contact could not be established, and the controller notified the relevant services of the aircraft's disappearance.



A search and rescue operation was launched. At 17:35 LT on the same day, the aircraft was found on fire. At 18:19 LT, the fire was extinguished, and the body of the deceased pilot was found inside the wreckage.

The police immediately secured the accident site and continued to secure it until the completion of the investigative activities at the accident site and the removal of the wreckage.

2. ANALYSIS

2.1. METEOROLOGICAL SITUATION

The weather conditions prevailing in Croatia on the day of the accident are common and characteristic of the season. The atmosphere was stable, without precipitation or significant winds. Under such conditions, a temperature inversion occurs in winter and late autumn, resulting in the formation of fog in lower areas. Under the influence of solar radiation and heating, the fog may dissipate during the day, only to form again towards the end of the day as solar heating weakens. Such a situation may persist for days, and sometimes for several weeks. This was also the case during the period in which this accident occurred. Almost identical weather conditions prevailed for days before and after the accident in question.

At the time the two Turkish Air Tractor aircrafts took off from Rijeka Airport towards Zagreb, conditions at Zagreb International Airport were favourable for VFR operations. During the flight towards Zagreb, the situation changed in precisely the manner described above. Towards the end of the day, as solar heating weakened and the temperature fell, fog began to form rapidly in the surface layer in the area of Zagreb International Airport. By the time the two Air Tractor aircraft approached Zagreb, the conditions at the airport no longer permitted a visual landing. They were forced to turn back and return along the same route to their point of departure, Rijeka Airport.

The meteorological conditions along the route in both directions, except over the mountain ridge above the coast, were satisfactory for VFR flight and, according to Pilot 2's statement, were nevertheless somewhat worse on the return flight. This was to be expected, as fog was forming in some areas towards the end of the day.

During the flight, the pilots maintained visual contact with the ground and with each other. This remained the case until they reached the mountainous area covered by low cloud.

Although the winds prevailing during those days were not strong, the direction and strength of the airflow were sufficient for orographic uplift to occur at the mountain barrier, resulting in the formation of a cloud layer. The temperature and humidity of the rising air were such that condensation, i.e. cloud formation, occurred at an altitude slightly below the height of the mountain ridge. Thus, the mountain ridge was in cloud.

2.2. FLIGHT PATH ANALYSIS

The recording of the entire flight path shows that the flight from take-off at Rijeka Airport to Zagreb and back towards Rijeka Airport proceeded without any elements indicating difficulties of any kind.



The final part of the flight path recording likewise shows nothing indicating possible difficulties, either in terms of technical problems or in terms of the pilot's control of the aircraft. The descent towards Rijeka Airport was continuous, and the direction of flight, i.e. the heading, was also approximately constant.

The recorded flight path indicates that the flight remained stable until impact (CFIT – Controlled Flight Into Terrain), i.e. that the pilot had control of the aircraft at all times.

This conclusion is also supported by the recording of communications between Pilot 1 and air traffic control. Communication proceeded normally, and Pilot 1's final transmission was made a few seconds before the aircraft in question disappeared from radar. The transmission was normal, without any indication of a problem.

2.3. TRACES AT THE ACCIDENT SITE

The traces at the accident site indicate that the aircraft struck the ground at a shallow angle, and that its direction of arrival immediately before impact corresponds to the direction of flight shown in the flight recording. This means that there are no indications of any irregularity in the aircraft's flight before it struck the ground.

It can be concluded that the aircraft was flying normally, gradually descending towards the airport, and that the pilot had full control of the aircraft.

The deformation of the propeller blades also indicates that the aircraft engine was operating, and at considerable power. The propeller blade that, together with the hub, was thrown approximately twenty metres to the right of the aircraft wreckage's longitudinal axis indicates significant propeller rotation and ejection due to centrifugal force after the remaining propeller blades detached and the hub, with one blade, separated from the shaft and engine.

2.4. PILOT 1

He was an experienced pilot who met all the prescribed requirements for flight operations in an Air Tractor 802A aircraft. He had completed firefighting training on this aircraft type and had participated in forest firefighting operations.

In the case in question, during the flight from Rijeka Airport towards Zagreb, the pilot flew along almost the same route as on the return flight. It may therefore be assumed that he was familiar with the configuration of the terrain over which he was flying.

However, when he entered the cloud during the return flight towards Rijeka Airport, the pilot was evidently not sufficiently aware of the configuration of the terrain over which he was flying or of the aircraft's height above the ground. He knew that he was approaching the airport at which he was to land and, while flying through the cloud, descended towards the airport, evidently unaware that there was an obstacle ahead which he would be unable to clear at that altitude.

Given that he was a good and experienced pilot, a possible factor of excessive self-confidence should also be taken into account. This resulted in entering conditions without visibility and selecting an apparently optimal flight path towards the airport. A certain 'buffer zone' was absent, which in this case would have meant: 'since I cannot see anything, as a precaution I will maintain a higher altitude than appears necessary'.



As regards the operation of the aircraft, the pilot remained in control of the aircraft until the impact itself. The flight was stable.

2.5. CONCLUSION OF THE ANALYSIS

The findings of this investigation do not indicate any possible technical defects in the aircraft. We consider that the aircraft in question was airworthy.

Meteorological conditions were a factor in this accident. However, this meteorological situation had persisted for days and there were no sudden or unforeseeable changes. The band of cloud over the mountain ridge above the coast had remained in the same position for days, with almost no change in its position, size or altitude.

The flight was filed and conducted under VFR. Under the applicable rules, entry into conditions that do not meet the criteria for VFR flight should not occur. The pilots nevertheless decided to pass through the cloud band, knowing that they would soon emerge from it and again encounter conditions of favourable visibility.

While flying through the cloud band, the pilot of the aircraft in question descended towards the airport. Such a flight path would have been entirely logical and ideal if there had been no mountain range between the coast and inland. Flying through cloud without visibility, Pilot 1 appears not to have been aware of his height above the ground. The aircraft struck the ground slightly below the hill ridge. At a somewhat greater altitude, it would have cleared the ridge at that point. However, the terrain configuration at that location is such that a plateau of almost the same elevation lies beyond the ridge and, had the aircraft continued along the same flight path, it would certainly have struck the ground shortly thereafter.

As both aircraft had already flown over this area in the opposite direction during the first part of the flight, it may be said that the pilots were well acquainted with the terrain and with the meteorological conditions, which did not change in this area during their flight.

While flying through cloud, the pilot could not have had an accurate perception of his height above the ground. In such conditions, a pilot should maintain an altitude at which he is certain that he will clear the relevant area, and probably a somewhat higher altitude 'as a precaution'. This did not occur in the case in question.

The fact that this was an experienced pilot who had flown demanding forest firefighting operations supports the assumption of excessive self-confidence and the absence of an 'as a precaution' factor. It is quite certain that the pilot was not aware of the aircraft's height above the ground or where the flight path along which he was descending in conditions without visibility, would lead him.

3. CONCLUSION

3.1. FINDINGS

Aircraft

- The aircraft in question met all prescribed requirements for operational use in VFR flight;
- At the time of the accident, the aircraft in question was airworthy;



Pilot 1

- He met the prescribed requirements for operating the aircraft in question;
- He had extensive flying experience;
- He had completed training for firefighting flight operations;
- He had participated in firefighting flight operations;

Meteorological conditions

- Were a factor in this accident;
- The weather was stable, without precipitation, with fog forming in low-lying areas and low cloud over the mountainous area between the coast and inland Croatia. Such a situation is common in late autumn;
- During the flight towards Zagreb, the conditions at Zagreb International Airport, where they were to land, deteriorated (fog) to the extent that a visual landing was not possible;

Flight

- A flight plan was filed for the flight of two Turkish Air Tractor AT-802A aircraft from Rijeka Airport to Zagreb International Airport.
- There was one person – the pilot – on board each aircraft;
- Both aircraft took off from Rijeka Airport towards Zagreb International Airport at 15:35 LT;
- They flew above the band of low cloud over the mountainous area between the coast and inland Croatia and continued the VFR flight towards Zagreb;
- Due to fog forming at Zagreb International Airport, they were unable to land and turned back towards Rijeka Airport before reaching Zagreb;
- The return flight proceeded normally and under visual flight rules until the mountain range near the coast;
- A band of low cloud extending to an altitude of approximately 1.500 m ASL was present over that mountain range.
- On the return flight, the pilots decided to pass through the cloud band while descending towards Rijeka Airport;
- During the flight through the cloud, the conditions for VFR flight were not met;
- The aircraft in question struck the mountain ridge while in stable and controlled flight;
- The second aircraft passed through the cloud band and landed at Rijeka Airport;

Crash

- The aircraft struck a gentle slope at a shallow angle, slightly below the hill ridge;
- The aircraft caught fire after the impact. The central part of the aircraft was completely burned;
- The pilot was fatally injured;
- The fire did not spread;

Search and rescue

- The search was organized immediately after notification of the aircraft's disappearance;
- The aircraft was found approximately one hour after it disappeared from radar, i.e. after the crash;
- The duration of the search did not affect the possibility of rescue, since the pilot on board the aircraft died when the aircraft struck the ground;



3.2. CAUSE

Immediate cause:

- Entry during a VFR flight into conditions that did not meet the criteria for VFR flight, and the resulting loss of perception of the aircraft's height above the ground.

Contributing factors

- Meteorological conditions;
- Pilot:
 - o The decision to enter cloud while operating under VFR;
 - o The decision to descend without external visual reference;
 - o Inadequate awareness of the aircraft's position and height above the terrain;
 - o Possible pilot overconfidence.

4.SAFETY RECOMMENDATIONS

The factors that led to this accident are well known in aviation practice and are also addressed by the existing aviation regulations. Consistent compliance with known and prescribed rules would most likely have prevented this accident.

Therefore, the Air, Maritime and Railway Traffic Accident Investigation Agency has not issued any safety recommendations in relation to this accident.

Investigator in charge

Danko Petrin