THE REPUBLIC OF CROATIA

Air, Maritime and Railway Traffic Accident Investigation Agency

Air Traffic Accident Investigation Department

CLASS: 343-08/24-02/03
No: 699-04/3-10
Zagreb, 20 December 2024

F I N A L R E P O R T

ON ACCIDENT OF JMB AIRCRAFT VL-3, CALL SIGN F-JVZK

31 MAY 2024, HVAR AIRPORT (LDSH), ISLAND OF HVAR

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CONTENT

OCCURRENCE INFORMATION

Type of the occurrence:	Accident
Date:	31 May 2024
Local time:	14:25
Place:	Hvar Airport (LDSH), Island of Hvar, Croatia
Flight rules:	VFR
Type of the aircraft:	Ultra-light aeroplane
Manufacturer / model:	JMB AIRCRAFT S.R.O. / VL-3 A HPV (P)
Aircraft serial number:	141
Identification number:	42OM
Call sign:	F-JVZK
Owner and operator:	Private person
Number of persons on bord:	Two
Number of injured persons:	Four
Damage to the aircraft:	Significantly damaged

INVESTIGATION

The Air, Maritime and Railway Traffic Accident Investigation Agency received information about the accident from the MUP Operations Control Centre and the Croatia Control. AIA investigators conducted an on-site investigation and commenced a safety investigation.

SUMMARY

On 31 May 2024, in the afternoon, a group of 39 aircraft began arriving at Hvar Airport. The group's landing began around 13:00 local time. After 33 aircraft had landed safely, one aircraft, during the final approach, deviated to the left of runway 10. The aircraft struck the ground and came to a stop on a dirt road running parallel to the runway. In the process, it seriously injured a cyclist and slightly injured two pedestrians who were on the aforementioned dirt road. The pilot of the aircraft, a French citizen, sustained no injuries, and the passenger in the aircraft, also a French citizen, sustained minor injuries.

The cause of the accident was a loss of control of the aircraft during the final approach phase.

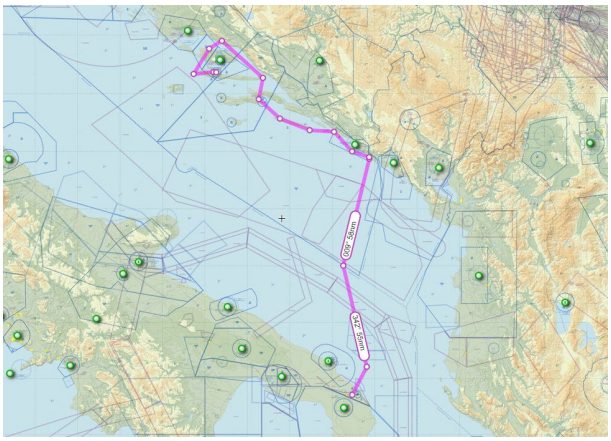
AIA issued no safety recommendations.

1. FACTS AND INFORMATION

1.1. FLIGHT INFORMATION

On 31 May 2024, in the afternoon, a group of 39 aircraft, divided into eight smaller formations, each with four to six aircraft, began arriving at Hvar Airport. That day, they flew from the Fondone airfield in the province of Lecce in Italy to Hvar Airport. The aircraft involved in the accident was part of the sixth formation.

Each formation was led by a more experienced commercial or military pilot with an instructor or examiner's license. The flight plan was not submitted for each individual aircraft, but for each individual formation, which is a standard procedure. According to the plan, the departure of the formations was scheduled for around 10:50 local time, and the flight was expected to last about 2 hours and 22 minutes.



Picture 1 – route according to the submitted flight plan

The first to land was the leader of the entire group and the first formation, a Belgian citizen, a member of the rescue service, a firefighter, a flight instructor and examiner, and a test pilot for the manufacturer of the aircraft involved in the accident. The group landing began around 13:00 local time, with the assistance of the president of the Faros Aero Club, who is also the operator of Hvar Airport. The leader guided the aircraft in French, and they landed in formation intervals of 10 to 15 minutes and gaps between aircraft of 2 to 3 minutes.

After 33 aircraft had landed safely, an accident was observed in which one aircraft, upon completing its approach, deviated of runway 10. The aircraft struck the ground and came to a stop on a dirt road parallel to the runway, seriously injuring a cyclist and slightly injuring two pedestrians who were on the road at the time. The pilot of the aircraft, a French citizen, sustained no injuries, while the passenger, also a French citizen, suffered minor injuries.

1.2. INJURIES

Table 1 – Number of injured persons

Injuries	Crew	Passengers	Other
fatal	0	0	0
serious	0	0	1
minor / none	0	1	2

1.3. DAMAGE TO THE AIRCRAFT

During the accident, significant damage was caused to the aircraft in the form of fractures of the structural elements of the fuselage and wings, fractures of the landing gear and propeller, rupture of the fuel tanks, and other damages.

A complete rupture of the fuselage is visible at the joint with the tail surfaces. The stabilizers and rudders on the tail surfaces are not damaged.

The right wing is severely damaged. Significant damage and deformations are visible on the leading edge of the wing, and cracks are visible on the fuselage in the area of the joint with the wing. No damage is visible on the wing control surfaces.

On the right side of the fuselage, behind the engine, there is a penetration caused by impact with an iron post of the airport fence. In this area, there is also visible fuel leakage, indicating that the post also tore the fuel system installations in that part. The penetration extends along the floor to the passenger footwell.

Picture 2 – damage to the wing and fuselage

Picture 3 – damage to the interior of the cabin

There are no visible damages on the cockpit cover, other transparent surfaces, or instrument panel. During the impact, the left main landing gear wheel broke off. The right main landing gear wheel and nose gear retracted into the fuselage. Both blades of the propeller broke off due to the impact.

Picture 4 – damage to the propeller

1.4. OTHER DAMAGE

On the grass near the runway, there are visible minor damages caused by the impact of the landing gear and the blades of the rotating propeller. The impact marks indicate significant ground contact, but there are no major damages that would affect the functionality of the airport surfaces.

1.5. PERSONAL INFORMATION

1.5.1. Pilot

Male person, French citizen born in 1956. The person was piloting the aircraft in the accident in question and holds a private pilot license issued in 1987 and an ultra-light aircraft license issued in 1990 by the French aviation authorities. The pilot also holds a valid "class 2 / LAPL" medical certificate issued on 30 January 2024.

After the accident the pilot stated that there were no technical problems or flight problems throughout the entire flight. The flight proceeded normally until the final approach. Immediately before touching down on the grass runway, he felt a drift from the right side of the aircraft. Despite attempts, he was unable to control the situation or correct the drift. As a result, the aircraft deviated from the runway, fell to the left of it, and came to a stop on a dirt road.

1.5.2. Passenger

Female person, French citizen. She travelled with a pilot through all stages of the journey, from France, through Italy, and to Croatia.

1.6. JMB AIRCRAFT VL-3, 42OM, F-JVZK INFORMATION

Type of the aircraft:	Ultra-light aeroplane
Manufacturer / model:	JMB AIRCRAFT S.R.O. / VL-3 A HPV (P)
Aircraft serial number:	141
Year of manufacture:	2014
Identification number:	42OM
Call sign:	F-JVZK
Built-in ballistic parachute:	6/473 SD SOFT B4
Empty weight of an aircraft:	307,30 kg (26.11.2019)
Maximum weight:	472,50 kg
Wingspan:	8,44 m
Length:	6,24 m
Height:	2,05 m

The JMB Aircraft VL-3 is a light-sport aircraft developed in the Czech Republic, distinguished by its composite construction. Thanks to the use of composite materials, the VL-3 is exceptionally light and aerodynamic, enabling high efficiency and impressive performance.

It is powered by reliable and economical Rotax engines, such as the 912 or 914 models, known for their durability. The aircraft's maximum speed is around 300 km/h, and its range is approximately 1,500 kilometres, depending on the load and flight conditions.

It is designed as a two-seater, making it ideal for recreational flying, training, and short business trips. The wings are shaped for maximum aerodynamic efficiency, and the aircraft fuselage has low drag, which further contributes to its excellent performance.

The cockpit is modern and ergonomically designed, equipped with advanced navigation and communication systems. Most models have digital displays, and there is also the possibility of customizing avionics to the specific wishes of the owner.

Safety is also at a high level, as the VL-3 is equipped with a whole-aircraft ballistic parachute, which provides additional safety in case of serious problems during flight.

Due to its excellent performance, economy, and modern design, the VL-3 is very popular among pilots, who appreciate its reliability and high level of comfort.

Since 2012, the new license holder for the production of this aircraft has been JMB Aircraft S.R.O., which was previously the distributor of Aveko aircraft for France and Belgium.

The aircraft in question is identified to the French authority. The owner and user of the aircraft is a private individual who was using it at the time of the accident.

In France and some other countries, for aircraft with a maximum take-off mass of less than 450 kg, or 475 kg if a ballistic parachute is installed, the owner is required to submit a declaration to the civil aviation authorities stating that the aircraft is airworthy.

For this aircraft, the owner submitted a declaration to the authorities on 9 October 2023. Based on this declaration, the authorities issued the acknowledgment of receipt which is valid until 8 October 2025.

In addition, an insurance policy has been issued for the aircraft, valid from 1 January to 31 December 2024.

1.7. METEOROLOGICAL INFORMATION

The meteorological situation had a partial influence on this accident.

For the purposes of this investigation, data from Split Airport (METAR), from the Hvar meteorological station was collected and analysed, and a reanalysis of the meteorological situation was performed using the numerical meso model WRF (Weather Research and Forecast Model).

At the time of the accident, the weather at Hvar Airport was cloudy and windy. The cloud base was at an altitude of 1500 to 2000 meters. The wind was blowing from 130 degrees (“jugo”) at a speed of about 8 m/s.

1.8. COMMUNICATION

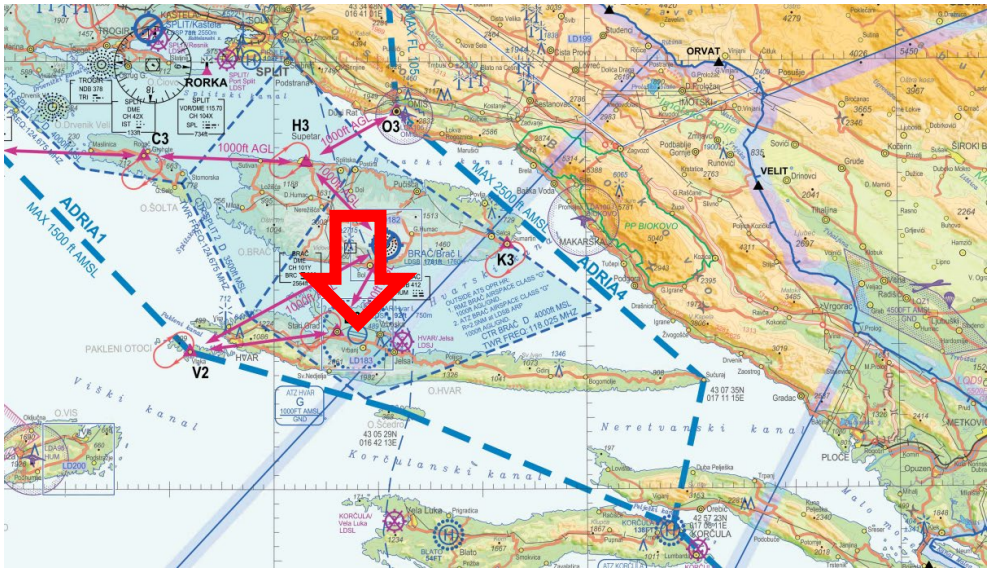
On the way to Hvar Airport, communication between the flight leader and air traffic control was conducted in English, which is standard procedure for group flights. Each group of aircraft had its own leader who communicated with the relevant air traffic control for a specific part of the journey. Within

the groups, members communicated with each other in French using a common frequency. Upon entering the Hvar Airport zone, they switched to the airport frequency of 124.500 MHz and communicated with the airport controller. After the first group leader landed, he took over communication with the other group leaders and members in French.

1.9. AIRPORT INFORMATION

Hvar Airport is located on the Island of Hvar, approximately 2 kilometres from the town of Stari Grad. It is equipped to handle the arrival and departure of small aircraft and is intended for VFR flights. Hvar Airport is open year-round. The runway is grass with white concrete edge markings, 750 meters long and 30 meters wide, oriented 10/28 with a load capacity of up to 1520 kg. Communications at Hvar Airport are on the frequency of 124.500 MHz, and the call sign is “Hvar radio”.

The airport is managed by the Faros Aero Club. Available services, airport usage fees, aircraft parking, regulations, and contact phone numbers are published in the Croatia Control VFR manual.



Picture 6 – Position of Hvar Airport

Picture 7 – Position and orientation of the runway on the island.

Picture 8 – Accident site

1.10. SEARCH AND RESCUE

As the aircraft crashed and stopped on the road next to the airport, there was no need to initiate a search.

People present at the accident site, tourists, pilots, the group leader, and the airport manager came to help the injured. The airport manager called the 112 Centre, the ambulance in Jelsa, the commander of the Stari Grad Volunteer Fire Department, and the police.

Upon arrival, emergency services treated the injured persons and secured the accident site.

1.11. DESCRIPTION OF THE ACCIDENT SITE

The aircraft crashed to the left of runway 10 threshold and came to a stop on the dirt road that runs along the edge of the airport parallel to the runway. Tire tracks are clearly visible from the runway to the dirt road.

Beyond the dirt road, the terrain is overgrown with bushes and trees, creating a natural barrier between the road and the surrounding vegetation.

1.12. ADDITIONAL INFORMATION

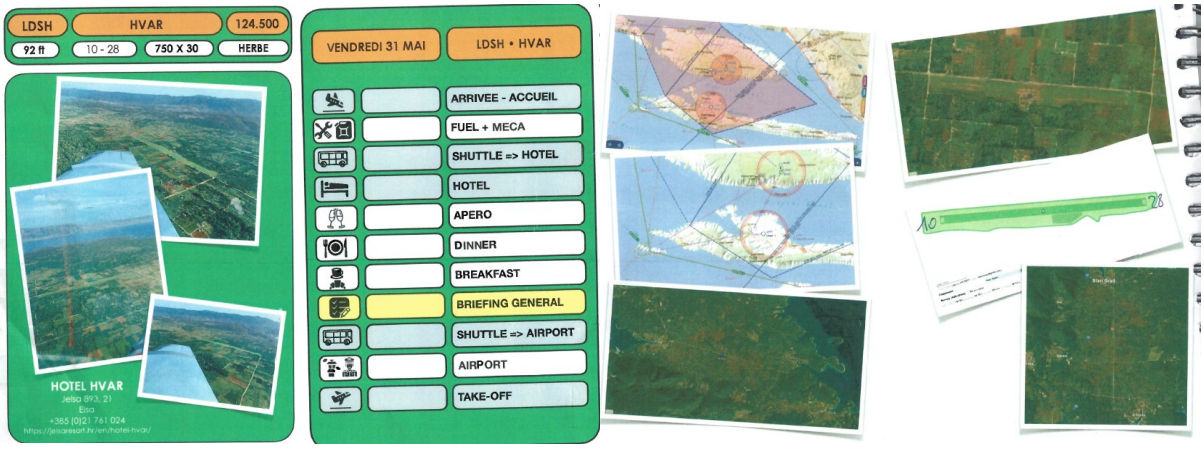
1.12.1. Documents in the aircraft

On board the aircraft at the accident site the pilot possessed personal documentation, aircraft documentation, and operational documentation for the planned flight.

The pilot's documentation included the ultralight aircraft pilot licence, the private pilot licence and the class 2 medical certificate class 2 and LAPL.

The aircraft documentation was in French and included the identification card, the acknowledgment of receipt of the declaration by the aircraft owner that the aircraft is airworthy, insurance policy, radio station operating license, ATC transponder operating license, radio equipment calibration certificates, weighing certificate, ballistic parachute documents, component list, and FORM 1 documents for equipment installed on the aircraft.

For the planned flight, the pilots had a small handbook containing information about all the airports they planned to fly to, airport maps, airport services, frequencies, contacts, and such, as well as information about services in the places where they were about to stay.



Picture 9 – Pages from the pilot's manual for Hvar Airport

2. ANALYSIS

2.1. AIRCRAFT PERFORMANCE

The subject aircraft belongs to the ultralight category and is characterized by good performance. According to the aircraft operating manual, the maximum allowable speed is 305 km/h. The manufacturer specifies a maximum take-off mass of 600 kg for this aircraft. The maximum take-off mass for aircraft in the ultralight category is limited to 472.5 kg, while the empty weight of the aircraft at the last weighing was 307.3 kg. Permissible wind speeds during take-off and landing are 5 m/s for crosswind and 8 m/s for headwind.

2.2. MASS AND CENTRE OF GRAVITY OF THE AIRCRAFT

At the time of the accident, there were two people on board the aircraft. A rough estimate, based on physical appearance, suggests the pilot weighed around a hundred kilograms. According to the pilots statement, woman passenger had around 47 kilograms. If we add 7 kg of luggage (as the pilot stated) and assume that there was enough fuel left in the aircraft for a flight to an alternate airport, plus an additional 30 minutes of flight, and for that, we take 20 litres of fuel (with a specific gravity of gasoline of 0.725 kg/l, which is 14.5 kilograms), we come to the conclusion that the aircraft was about ten kilograms heavier than the maximum take-off mass for the ultralight category, but well below the maximum take-off mass of the aircraft stated by the manufacturer.

A check of the aircraft's centre of gravity showed that it was within the permitted limits.

2.3. METEOROLOGICAL CONDITIONS

The weather at the accident site was cloudy but with sufficient visibility for VFR flight, which was conducted below the clouds.

A “jugo” wind was blowing, meaning a southeast wind that can have some fluctuations in strength but without sudden or strong gusts. In the ground layer, due to the influence of terrain and possible obstacles on the ground, turbulence can occur with this type of wind.

Based on meteorological data and data on the direction of the runway at Hvar Airport, it follows that the aircrafts in the group, including the subject aircraft, had an approximately headwind during landing, or angled about 30^{o} from the right. In addition, it should be borne in mind that the direction and strength of the wind had some fluctuations.

2.4. CONCLUSION OF THE ANALYSIS

According to the findings of this investigation and the pilot's statement, this accident occurred due to a loss of control over the aircraft during the final approach phase, immediately before landing.

The meteorological situation, namely moderate wind with a somewhat sideways component relative to the aircraft's landing direction, may have contributed to this development of events. Although the landing conditions were not optimal, wind cannot be considered as the key factor that caused this accident. This is supported by the fact that the other 38 aircraft in the group landed in the same conditions without any difficulties.

3. CONCLUSION

3.1. FINDINGS

3.1.1. Flight preparation

- The pilot and other pilots in the group had the necessary operational plans and flight manuals,
- The pilots submitted flight plans for the group flight,
- Communication within the group was conducted in French,
- Communication with air traffic control was conducted by the group leader.

3.1.2. Meteorological conditions

- Satisfactory for Visual Flight Rules (VFR) flight,
- A moderate wind (jugo) was blowing,
- The wind direction during landing was approximately 30^{o} to the left of the aircraft's longitudinal axis.

3.1.3. Aircraft

- Has valid documentation for domestic flights,
- Has a ballistic parachute installed,
- Has not had any technical problems on this or previous flights.

3.1.4. Pilot

- Possesses valid PPL and SPL license,
- Possesses valid medical certificate.

3.1.5. Flight

- The flight from Italy proceeded without any problems,
- The aircraft made an approach to runway 10,
- 33 aircrafts from a group of 39 landed prior to the subject aircraft without difficulties
- The remaining aircrafts landed after the accident also without any problems.

3.1.6. Impact and consequences

- During the last alignment, the pilot lost control and the aircraft steered to the left,
- On the area from the runway to the dirt road, there were traces of impact from the main landing gear and propeller,
- Due to the impact, the aircraft suffered significant mechanical damage,

- A passenger in the aircraft and two passers-by on the road were slightly injured, and one other was seriously injured.

3.2. CAUSE

Loss of control of the aircraft during landing.

Contributing factors

- Meteorological conditions, i.e. wind which could have somewhat complicated the landing.

4. SAFETY RECOMMENDATIONS

Considering the findings and conclusions that resulted from this investigation, the Air, Maritime and Railway Traffic Accident Investigation Agency does not have a safety recommendation.

Investigator in Charge

Tomo Matić