



MINISTRY OF TRANSPORT, CONSTRUCTION AND REGIONAL DEVELOPMENT OF THE SLOVAK REPUBLIC

Air Accident and Incident Investigation Department
Nám. slobody 6, P.O. BOX.100, 810 05 Bratislava 15

Reg. No: SKA2010020

FINAL REPORT

on investigation of an air accident

of aircraft type **Z-726**

registration No. **OM-RMS**

Date: 18.08.2010

Place: Airport Partizánske / LZPT

A. INTRODUCTION

The investigation of air accident [AA], serious incident [SI], has been conducted pursuant to Art. 18 of the Act No 143/1998 on Civil Aviation (Civil Aviation Act) and on Amendment of Certain Acts, in accordance with the Regulation (EU) No. 996/2010 of the European Parliament and of the Council on investigation and prevention of civil aviation accidents and incidents, governing the investigation of civil aviation accidents and incidents.

The final report is issued in accordance with the Regulation L 13 that is the application of the provisions of ANNEX 13 Air Accident and Incident Investigation to the Convention on International Civil Aviation.

The exclusive aim of investigation is to establish causes of an accident or serious incident and prevent their occurrence, but not to refer to any fault or liability of persons.

This final report, its individual parts or other documents related to the investigation of the air accident have informative character and can only be used as recommendation for the implementation of measures to prevent occurrence of other air accidents and serious incidents with similar causes.

Owner: Miroslav Repka, Záhradnícka 3806/13A, 979 01 Rimavská Sobota
Stanislav Repka, Jr., Športová 1563/10, 979 01 Rimavská Sobota
Stanislav Repka, Sr., Horná 157/4, 980 52 Hrachovo
Ing. Zsolt Ciriak, Júliusa Szabóa 1297/5, 984 01 Lučenec

Operator: SNA gen. M. R. Štefánika, Pri Rajčianke 49, 010 01 Žilina

Type of aircraft: Z-726

Registration No.: OM-RMS



Place of take-off: Partizánske Airport / LZPT
Planned place of landing: Lučenec Airport / LZLU
Flight phase: spin flight in a low altitude
Place of accident: N 48°37'10.8'', E 018°20'17.4 ''
Date and time of accident: 18.08.2010, 13:00 hrs

Note: All times in this Report are UTC.

B. INFORMATIVE SUMMARY

On 18 August 2010 the pilot carrying a passenger (hereinafter referred to as "passenger") with aircraft Z-726, registration No. OM-RMS, conducted a take-off from the airport LZPT. After the take-off the pilot made a 180° left turn and by a low pass returned to the runway 07. He made another 270° left-hand climbing turn around the airport tower and adjacent buildings to a height of 100 m. At the level of the runway he started a half-roll. Once rolled over on its back, the aircraft lost the height and fell to the dam of the river Nitra, just behind the airfield.

The following persons were appointed as investigators of the air accident:

Ing. BENEK Igor	chairman of the Permanent Investigation Commission
Ing. GRELL Ladislav	member of the Permanent Investigation Commission

The report is issued by:

Air Accident and Incident Investigation Board
of the Ministry of Transport, Construction and Regional Development
of the Slovak Republic

C. MAIN PART OF REPORT

1. FACTUAL INFORMATION
2. ANALYSES
3. CONCLUSIONS
4. SAFETY RECOMMENDATIONS

1. FACTUAL INFORMATION

1.1 History of the flight

On 18 August 2010 the pilot carrying a passenger with aircraft Z-726, registration No. OM-RMS, conducted a take-off from the airport LZPT to the airport LZLU.

Before the take-off the aircraft was in a configuration with additional fuel tanks on wing tips and with ties for picketing of the aircraft.

The pilot carrying a passenger conducted a take-off from the runway 25R. After the take-off the pilot made a 180° left-hand turn and returned in a low pass to the runway 07 (in the west-east direction) in an altitude of 5 m. When he reached the level of the tower, the pilot increased the engine power and started to climb. In an altitude of 30 m the pilot started a left-handed turn (with a bank of 40°), that he terminated to 270° in an altitude of 100 m. Subsequently the pilot made a half-roll followed by a spin flight for 2 seconds. During the spin flight the flying height decreased (to about 50 m). From this position the aircraft fell to the dam of the river Nitra under a steep gradient of 70°.

The search was not necessary. The persons present at the airport reported the air accident by phone to the fire rescue service, medical rescue service, police and the Air Accident and Incident Investigation Board of MTPT SR.

The pilot and the passenger suffered fatal injuries in the accident.

Light conditions: Daylight

Flight rules: VFR

1.2 Injuries to persons

Injury	Crew	Passengers	Other persons
Fatal	1	1	-
Serious	-	-	-
Minor	-	-	-
None	-	-	-

1.3 Damage to aircraft

The aircraft was destroyed in the accident.



1.4 Other damages

The Air Accident and Incident Investigation Board was not informed about circumstances with potential claims for compensation of other damages toward a third party.

1.5 Personnel information

Pilot: Citizen of Slovak Republic, aged of 39, holder of the aviation personnel licence PPL(A) No. SK 02990215, issued by the Civil Aviation Authority of the Slovak Republic on 30 June 1999.

Qualifications: SEP(L) with marked validity until 30 April 2011.

Total flying hours before the accident: 274:01 hrs
Flying time of which were on type Z-726: 123:16 hrs

Passenger: Citizen of Slovak Republic, aged of 33.

1.6 Aircraft information

- a) **Airframe:** Type: Z-726, registration No: OM-RMS
Serial No: 1360, year of manufacture 1974
Manufacturer: MORAVAN, a.s., OTROKOVICE, Czech Republic

Certificate of airworthiness No. 0694 issued by the Civil Aviation Authority of SR on 21 October 2008. Certificate of airworthiness inspection with marked validity until 20 October 2010.

Total flight hours since year of manufacture: 1 507:33 hrs and 5 166 flights
Of which from the last general overhaul: 354:22 hrs and 1 459 flights

- b) **Engine:** Type: M 137AZ, serial No: 872585, year of manufacture: 1987
Manufacturer: AVIA n.p. Praha 9, Letňany, Czech Republic

The engine was incorporated in the aircraft on 20 September 2009.

Total flying hours from the year of manufacture: 820:06 hrs

- c) **Propeller:** Type: V 503A, serial No: 82053833, year of manufacture: 1978
Manufacturer: AVIA n.p. Praha 9, Letňany, Czech Republic.

The propeller was incorporated in the aircraft on 1 December 2006

Total flying hours since year of manufacture: 2 256:57 hrs

Of which from the last general overhaul: 52:11 hrs

- d) **Calculation of weight of aircraft at the time of air accident**

Empty weight of aircraft:	711.9 kg
Weight of pilot:	80.0 kg
Weight of passenger:	80.0 kg
Weight of fuel: approx. 90 l x 0,72kg/l	67.5 kg
Weight of oil: approx. 7l x 0,90 kg/l	6.3 kg
<u>Weight of cargo :</u>	<u>10.0 kg</u>
Total weight of aircraft at the time of AA:	945.7 kg

Maximum permitted take-off weight of aircraft according to the flight manual is 1 000 kg.

The weight of aircraft at the time of air accident was within the permitted range.

1.7 Meteorological information

A humid and cool air from the west was blowing along the southern margin of the low-pressure area above Scandinavia to Central Europe. A cloudy weather without precipitation prevailed at the critical time in the area of the air accident. The lower cloud base was FEW 2500-4400 ft, SCT 6000-8000 ft, BKN 14000, with visibility distance of more than 10 km.

At the time of the air accident the ground wind was within the range of 220°- 250° and the wind power was 8 – 15 KT. The air temperature was +21°C.

Meteorological conditions in given place and time of accident had no influence on the flight of the aircraft and did not participate in the occurrence of the air accident.

1.8 Aids to navigation

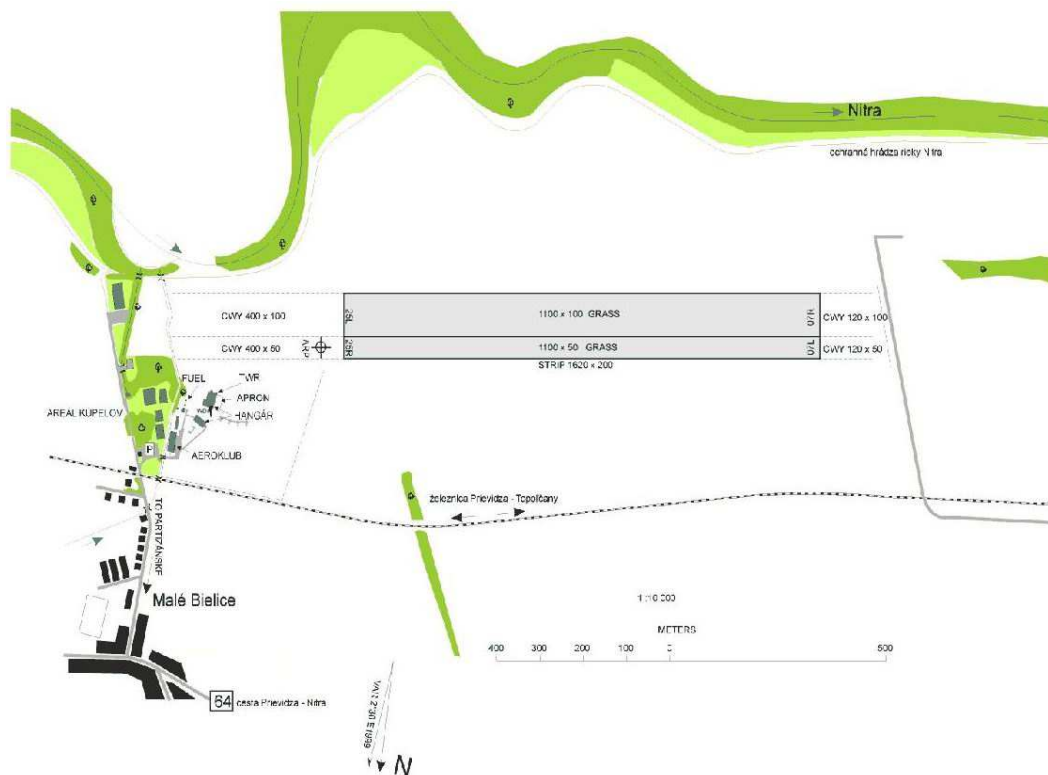
Not applicable.

1.9 Communications

The aircraft was equipped by a radio communication system enabling a two-way communication with all air stations at any moment of flight.

1.10 Aerodrome information

LZPT is a public domestic aerodrome with grass surface and dimensions of the runway 07L/25R of 1100 x 50 m and of the runway 07R/25L of 1100 x 100 m. At the time of the air accident it was operable and suitable for take-off and landing of aircraft of this type.

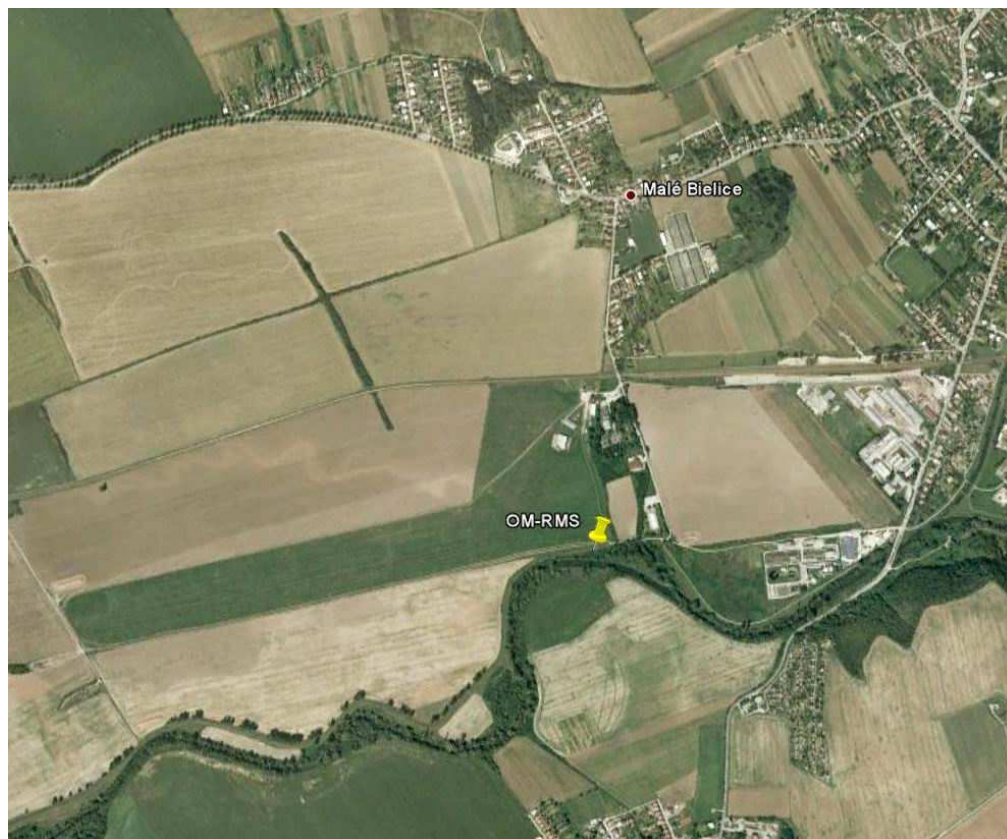


1.11 Flight recorders

Not applicable.

1.12 Wreckage and impact information

The aircraft fell to the ground near the aircraft LZPT under an angle of 70°, in the close proximity of the dam of the river Nitra. The final position of the aircraft after the air accident was documented, including performance of photodocumentation. The bodies of the pilot and the passenger were found in the area of wreckage.



1.13 Medical and pathological information

Pilot

The immediate cause of the pilot's death were multiple crushing and devastating injuries of vital organs incompatible with life.

The autopsy did not reveal any traumatic changes indicating an injury by a mechanism, such as sharp object, or an injury caused to the pilot during the flight by an object loosened in the cabin during an acrobatic manoeuvre before the air accident.

The autopsy did not reveal any thermic injuries that the pilot could theoretically suffer during fire, whether in the aircraft during the flight or as a result of the wreckage catching fire after the crash.

In spite of the extensive devastating injuries suffered by the pilot it was possible to assess potential pathological changes of bodies and tissues. No acute or chronic pathological changes or pathological changes causing a sudden failure of one organ, which could result in a failure of the ability to safely fly a powered aircraft, were detected.

Based on results of toxicological analysis it was established that the pilot was not under the influence of alcohol or forensically relevant drugs, narcotics or other psychotropic substances that could decrease his attention during the flight.

On the basis of traumatic changes of upper and lower extremities detected by autopsy, as well as conducted laboratory biochemical tests and investigation of circumstances it can be concluded that at the time of impact of the aircraft with the ground both upper and lower extremities of the pilot were with the highest probability in active position on the control elements of the aircraft. It means that the pilot was flying the aircraft just before the accident and at the time of the ground impact.

Passenger

The immediate cause of the passenger's death were crushing brain injuries and destructive injuries to the thorax and abdomen.

At the time of accident the passenger was not under the influence of psychotropic substances, narcotics or drugs that could decrease his attention during the flight. On the other hand, the passenger was under the influence of alcohol with concentration of 0.90 g/kg (pro mille), i.e. slightly drunk, which however with the highest probability had no influence on the occurrence of the critical accident.

The autopsy did not reveal any thermic injuries that the passenger could theoretically suffer during fire, whether in the aircraft during the flight or as a result of the wreckage catching fire after the crash. No chronic or acute pathological changes, that could be in causal connection with the death of the passenger, were detected.

On the basis of traumatic changes of upper and lower extremities detected by autopsy it was concluded that at the time of ground impact/deceleration of aircraft both upper extremities of the passenger had not been in active position on control elements of the aircraft. It means that the passenger was not flying the aircraft at the time of ground impact.

1.14 Fire

No fire broke up.

1.15 Survival aspects

Search and rescue were not required.

The pilot and the passenger suffered fatal injuries due to the aircraft impact on the ground and their death could not be prevented, even by provision of timely and professional medical help.

1.16 Tests and research

The following devices were submitted for expertise: speedometer, variometer, revolution counter, double pressure indicator, accelerometer.

Skúmaním bolo zistené, že na matnici rýchlomera boli nájdené vrypy od ručičky ukazovateľa rýchlosti odpovedajúce rýchlosti približne 178 km/h.

The accelerometer indicated deceleration of nearly $-7g$, the absolute value of which had an upward tendency at the time of ground impact of the aircraft.

The variometer, the revolution counter and the double pressure indicator did not show any marks left by the pointers on the ground-glass screen of the device.

1.17 Organizational and management information

The aircraft operators are private persons holding licences for performance of flights with given aircraft type. The aircraft was not operated for commercial purposes at the time of the critical accident.

1.18 Additional information

The critical flight was conducted in a configuration with additional fuel tanks. According to the Flight Manual acrobatic elements in a configuration of aircraft with additional fuel tanks on wing tips are not permitted.

The examination of the pilot's and the passenger's fastening showed that they had only been fastened by abdominal belts during the flight.

1.19 Useful or effective investigation techniques

Standard investigation methods were used.

2. ANALYSIS

2.1. Aircraft operation

At the time of accident the aircraft was in a configuration of non-acrobatic operation with additional fuel tanks. The pilot and the passenger were not properly fastened in the cabin in the higher pilotage phase.

Elements of higher pilotage are: half-roll, looping, Immelman turn, barrel roll, hammerhead turn, combat turn, spinning, nose-dives and zoom (steep climbing) under minimum angle of 45° and other elements specified in the Flight Manual.

Flights of higher and high pilotage can be conducted within a scope determined by the operating limits of the aircraft specified in the Flight Manual or other document replacing it.

2.2. Pilot's activity

After the take-off from runway 25R the pilot decided to carry out the activity without clear designation of the flight purpose in the area of the airport LZPT. He returned to the runway by making a 180° left-hand turn with the aircraft and made a low pass over it. When he completed a 270° turn he made a half-roll at the level of the runway, followed by a spin flight. During this flight the aircraft lost height and fell under a steep angle to the dam of the river Nitra.

2.3. Conclusions of forensic expertise

All injuries suffered by the pilot and the passenger, detected by autopsy, were undoubtedly caused during the accident of the two-seat powered aircraft. They were caused by vertical deceleration when the aircraft fell to the ground, probably with a 70° impact angle and a high impact speed.

The autopsy did not reveal any traumatic changes in the pilot's and the passenger's bodies indicating an injury by a mechanism, such as sharp object, or an injury caused by impact of an object loosened in the cabin during the acrobatic manoeuvre.

The external and internal inspection of the pilot and the passenger and laboratory tests of biological materials taken during the autopsy did not reveal any acute or chronic pathological changes that could have negatively affected attention and action of the pilot and the passenger at the time of accident, or that would have been in causal connection with their death.

At the time of the accident the passenger was under the influence of alcohol with concentration of 0.90 g/kg (pro mille), i.e. slightly drunk, which however with high probability had no influence on the occurrence of the air accident.

3. CONCLUSIONS / Cause of air accident

3.1 Findings

The pilot had valid qualifications and sufficient experiences for performance of the critical flight.

No pathological changes likely to negatively affect the pilot's attention and action at the time of accident were detected.

The pilot and the passenger were only fastened by abdominal belts.

The passenger was under the influence of alcohol at the time of accident.

The aircraft had a valid documentation and did not show any faults before the accident.

3.2 Cause of air accident

The main cause of the air accident was poor mastering of the higher flying technique in a low altitude with aircraft in configuration with additional fuel tanks, without the pilot and passengers being fastened with arm belts and lower fastening belt, which could influence the aircraft pilotage during performance of acrobatic elements.

4. SAFETY RECOMMENDATIONS

On the basis of investigation of causes of the air accident of the aircraft

Type: **Z-726**

Registration No. **OM-RMS**

Date of accident: **18.08.2010**

We recommend to the operator Slovak National Aero Club to conduct an analysis of the air accident with flight personnel.

Bratislava, 23 February 2011