



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



Aviation and Maritime Investigation Authority
Námestie slobody 6, P.O.BOX 100, 810 05 Bratislava 15

Reg. No. SKS2012003

FINAL REPORT

on investigation of serious incident

of aircraft type **Z-43**

Registration No. **OM-XON**

Date: 18.09.2012

Location: Airport Nitra / LZNI

The investigation of occurrence 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 and 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 Aircraft Accident and Incident Investigation to the Convention on International Civil Aviation.

The exclusive aim of investigation is to establish causes of accident, incident and to 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 occurrence in question have an informative character and can only be used as recommendation for the implementation of measures to prevent occurrence of other accidents and incidents with similar causes.

A. INTRODUCTION

Type of aircraft:	Z-43
Registration No:	OM-XON
Operator/Owner:	AERO NITRA, spol. s.r.o. Airport Janíkovce, 949 07 Nitra
Take-off site:	LZNI
Planned landing site:	LZNI
Flight phase:	aerodrome circling
Type of operation:	general aviation – training flight
Place of accident:	field down the wind, right-handed circle for RWY 15R
Date and time of accident:	18.09.2012, 15:30

Note: All time data in this report are stated in the UTC time.

B. INFORMATIVE SUMMARY

On 18.09.2012 the pilot with instructor was making refresher flights after a longer flying break, with emphasis on emergency procedures with aircraft type Z-43, registration No. OM-XON, at the airport LZNI. During the second flight devoted to engine failure drill the engine did not respond to the opening of the throttle. In view of the position and flight altitude the instructor made a ground landing.

The aircraft was not damaged and the crew was not injured in the occurrence.

The following commission was appointed for investigation of the serious incident:

Jaroslav JUSZCZUK
Ing. Igor BENEK

The report is issued by:

Aviation and Maritime Investigation Authority
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

During the second circling flight in an altitude of 100 ft GND the instructor cut the throttle for emergency drill in case of engine failure in the take-off phase. The pilot did the simulated engine failure according to prescribed procedures and the crew continued the climb.

At the level of the second circle turn, in an altitude of 700 ft GND, the instructor again throttled down the engine to idling speed for the pilot to conduct the engine failure drill in the flight phase. The pilot with aircraft planed down the circle and decided to make a ground landing on selected surface. In an altitude of 250-300 ft above the ground the instructor warned the pilot that he had chosen an indirect landing direction with tail wind and set the engine throttle to the take-off mode.

The instructor and the pilot in their statements indicated that during the attempt at interruption of engine failure drill the engine had not responded to the opening of the throttle.

In view of the position and flight altitude the instructor took over and landed the aircraft in the flight direction on selected surface down the wind.

Daytime: day

Flight rules: VFR

1.2 Injuries to persons

Injury	Crew	Passengers	Other persons
Fatal	-	-	-
Serious	-	-	-
Minor	-	-	-
None	2	-	-

1.3 Damage to aircraft

No damage was detected on the airframe other than minor scratches on aircraft wings, caused by the transport of the aircraft.

1.4 Other damage

No circumstances with potential claims for compensation of other damage toward a third party were notified to the Aviation and Maritime Investigation Authority.

1.5 Personnel information

Pilot:

A national of SR, aged of 44 years,

holder of private pilot licence PPL(A), No. SK 02020228, issued by the Civil Aviation Authority of SR on 2 October 2002, with marked validity until 25.03.2015.

Medical certificate of 1st class with marked validity until 12.08.2013.

Qualifications:

SEP(L) with marked validity until 31.08.2013

ULL with marked validity until 30.09.2013

Flying experience:

Total flight hours : 232:00 h 470 flights

In it with type Z-43, total: 2:55 h

In it with type Z-43 as PIC: 2:25 h

Instructor:

A national of SR, aged of 43 years

holder of commercial pilot licence CPL(A), No. SK 03000114, issued by the Civil Aviation Authority of SR on 30 May 2000, with marked validity until 30.03.2017.

Medical certificate of 1st class with marked validity until 21.12.2012.

Medical certificate of 2nd class with marked validity until 21.12.2013.

Qualifications:

FI (A) with marked validity until 31.12.2013

SEP(L) with marked validity until 31.10.2013

TMG with marked validity until 31.10.2013

Flying experience:

Total flight hours : 2705:25 h 8746 flights

Over the last period: 205:20 h 583 flights

In it with type Z-43, total: 182:50 h

In it with type Z-43 as PIC: 146:20 h

1.6 Aircraft information

Type: ZLÍN Z-43

Registration No: OM-XON

Serial No: 0109

Year of manufacture: 1992

Manufacturer: Moravan a.s. Otrokovice, CR

Certificate of airworthiness No. 4479, issued by the Civil Aviation Authority of SR on 29.09.2008, with marked validity until 24.09.2012.

Total operating hours : 1192:55 h

Total number of take-offs: 925

Release for operation: CRS No.1/2012 XON of 23.02.2012, 1121:50 h

1.7 Meteorological information

The meteorological conditions had no influence of the incident.

1.8 Aids to navigation

Not applicable.

1.9 Communications

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

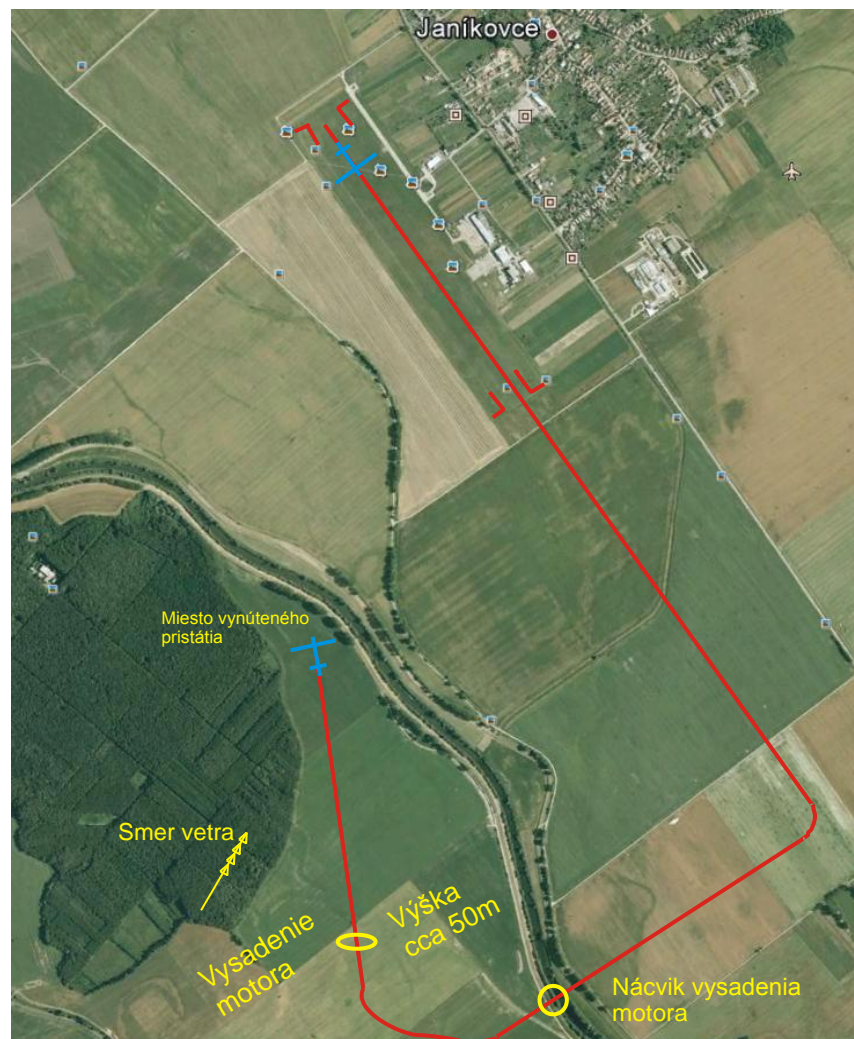
1.10 Aerodrome information

The airport LZNI is an international public aerodrome with irregular traffic. RWY 15/33 has a grass surface. The airport was suitable for flight operation of the aircraft type.

1.11 Flight recorders

Not applicable.

1.12 Wreckage and impact information



Position of aircraft – a field in the operation area of the airport LZNI

1.13 Medical and pathological information

Not applicable.

1.14 Fire

No fire broke out.

1.15 Survival aspects

The search and rescue operations using SAR means were not required.

1.16 Tests and research

During investigation into causes of the serious incident the engine condition and the fuel installation of the aircraft were assessed.

The engine of the aircraft was subject to the expertise with the aim to assess its overall condition. The inspectors did not detect any damages to the engine or other signs, which could lead to its potential failure.

On 09.11.2012 engine and flight tests were implemented. During the engine test the aircraft behaviour was consistent with the flight manual.

Engine test	no fault
Boost	no fault
Oil filters	no fault
Fuel filters	no fault
Fuel-injection pump	no fault
Injection nozzles	no fault
Heads of cylinders	no fault
Valve play	no fault
Magnetos	no fault
Starting buzzer	no fault
Spark plugs	no fault
Induction manifold	no fault
Exhaust manifold	no fault
Compressor	no fault
Bolting	no fault
Fuel	no finding
Oil	no finding

During the flight test the simulated engine failure procedure was repeated three times over the airport. The engine did not show a tendency to power loss (at fast change of engine throttle, fast or slow opening) during the implementation of these procedures. During the flight test at full throttle the test pilot observed a drop of fuel pressure from 0.40 Pa to 0.27 Pa. This drop automatically returned to the value of 0.40 Pa after moderate reduction of throttles.

After aircraft landing another engine test was conducted on the ground, but no such drop was observed.

After consultation with the engine manufacturer it was declared that this phenomenon was commonplace up to the value of 0.30 Pa and that in case of a larger pressure drop the check of fuel pump would be necessary.

This statement was made on the basis of aircraft refueling with gasoline BA91-98N and the aircraft operator was recommended to use the fuel type prescribed by the manufacturer.

After the replacement of gasoline for fuel prescribed by the engine manufacturer during the engine test all parameters of the engine were consistent with specifications of its manufacturer.

1.17 Organizational and management information

The flight of the aircraft was in accordance with the training syllabus of the aviation school.

1.18 Additional information

Not applicable.

1.19 Useful or effective investigation techniques

Standard investigation methods were used.

2. ANALYSIS

The binding decisions of AD and service bulletins were applied to the aircraft. The checks were implemented in an authorized organization and are indicated in the technical file of the aircraft.

The airworthiness of the aircraft was controlled by the aircraft operator who did not respect recommendations of the aircraft manufacturer – holder of the type certificate when controlling the airworthiness and performing maintenance of the aircraft. The aircraft operator used an unauthorized gasoline type contrary to the aircraft operation manual. At the time of serious incident the aircraft was filled by gasoline BA91-98N of non-specified charge (summer / winter).

This gasoline type can only be used after the application of Bulletin Z43/28b, which regulates the airframe fuel installation. The application of this bulletin prevents the limitation of fuel throughput in the aircraft fuel installation. Regulation of fuel installation in accordance with the bulletin ensures the supply of a sufficient amount of fuel to engine in all operating modes and thus eliminate the development of vapour lock (application of pressure from saturated favours of used gasoline).

After the replacement of fuel for that prescribed by the manufacturer all parameters of the engine of aircraft were consistent with data of the engine manufacturer.

During investigation and assessment of the engine condition the inspectors did not find any reasons for potential failure or power loss, which could result in emergency ground landing of the aircraft.

3. CONCLUSIONS / CAUSE OF SERIOUS INCIDENT

3.1 Findings:

Aircraft:

- the aircraft had a valid certificate of airworthiness,
- the maximum take-off weight was not exceeded,
- the aircraft was technically fit and airworthy for the critical flight,
- the aircraft operator did not comply with recommendations of the aircraft manufacturer regarding the preservation of airworthiness and the implementation of maintenance of the aircraft,
- the aircraft operator used an unauthorized gasoline type.

Crew of aircraft:

- the pilot and the instructor had valid licences and authorizations for the critical flight.

3.2 Causes of serious incident:

- the probable cause of the serious incident was the use of unauthorized gasoline, which caused that the fuel pump was unable to supply the required amount of fuel in the respective flight phase when the rating of the aircraft engine was changed to maximum operating capacity.

The aircraft was operated in contradiction with recommendations of its manufacturer.

4. FLIGHT SAFETY RECOMMENDATION

On the basis of investigation into causes of serious incident of

Aircraft type **Z-43**

Registration No. **OM- XON**

Date **18.09.2012**

We recommend the aircraft operator to take the following measure:

- in case of use of the aircraft and its maintenance to comply with recommendations and binding decisions of the aircraft manufacturer;
- in case of use of the unauthorized gasoline type BA91-98N any aircraft operation should be preceded by the application of the bulletin Z43/28b, evaluation of the state of fuel installation, declaration of the application of the bulletin and making the respective entry into the technical file of the aircraft.

Bratislava, 03.06.2013