MINISTRY OF TRANSPORT, CONSTRUCTION AND REGIONAL DEVELOPMENT OF THE SLOVAK REPUBLIC
Aviation and Maritime Investigation Authority
Nám. slobody 6, P.O.BOX 100, 810 05 Bratislava 15

Reg. No.: SKA2012009

F I N A L R E P O R T

on investigation of parachute accident

Date: 07.07.2012

Place: Airport Dubnica nad Váhom-Slávnica / LZDB

A. INTRODUCTION

The investigation of air accident, serious incident, 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 accident, serious 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 the air accident in question have an 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

Operator:	Slovak National Aero Club (SNA)
Owner of parachute:	private person
Organiser of parachute operations:	Aero Club Dubnica nad Váhom
Jump off point:	LZDB
Flight phase:	jump
Site of parachute accident:	200 m SSW of the threshold of RWY 05R
	N 48°59´28,68´´, E 18°11´14,54´´
Date and time of accident:	07.07.2012, 11 h 22 min

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

B. INFORMATIVE SUMMARY

On 7 July 2012 the Aero Club Dubnica nad Váhom organized parachute operations at the Airport LZDB. The parachutists jumped from aircraft L-410, registration No. OM-ODQ, from altitude of 4,000 m above the ground level („AGL“).

During the sixth parachute flight a parachutist falling free failed to keep the chest-first position in altitude of 1,900 m AGL and turned on his back. He handled the situation by immediately opening the reserve parachute in altitude of 1,600 m AGL. The parachutist fell into trees at the airport LZDB at increased speed of fall and sufferred a backbone injury at the impact.

The parachute accident was reported through teh operator (organiser of parachute operations) to OOPZ Ilava and to the Aviation and Maritime Investigation Authority of the Ministry of Transport, Construction and Regional Development of SR.

The board composed of the following members was appointed for investigation of causes of parachute accident:

Miroslav Gábor – chairman of the board

Ing. Igor Benek – member of the investigation board.

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

On 7 July 2012 parachute operations organized by the Aero Club Dubnica nad Váhom took place at the Airport LZDB in accordance with the Rules for parachute operations (Regulation No. 4/2010) and Directive V-PARA-1.

Parachute jumps were made from aircraft L-410, registration OM-ODQ, from altitude of 4,000 m AGL.

During the sixth parachute flight the named parachutist made his second jump at that day. After 44 seconds, during a free fall in altitude of 1,900 m AGL, the parachutist failed to keep the chest-first position and turned on his back. He handled the situation by immediate opening of the reserve parachute and succedded after 6 second of the back-first fall, in altitude of 1,600 m AGL.

The extracting parachute and the container with canopy of the reserve parachute flew off left of the parachutist. After or during opening of the canopy of the reserve parachute, four rigging cords of the left front strap and left control cord got broken.

The breaking of cords caused partial deformation of the canopy of the reserve parachute, followed by rotation.

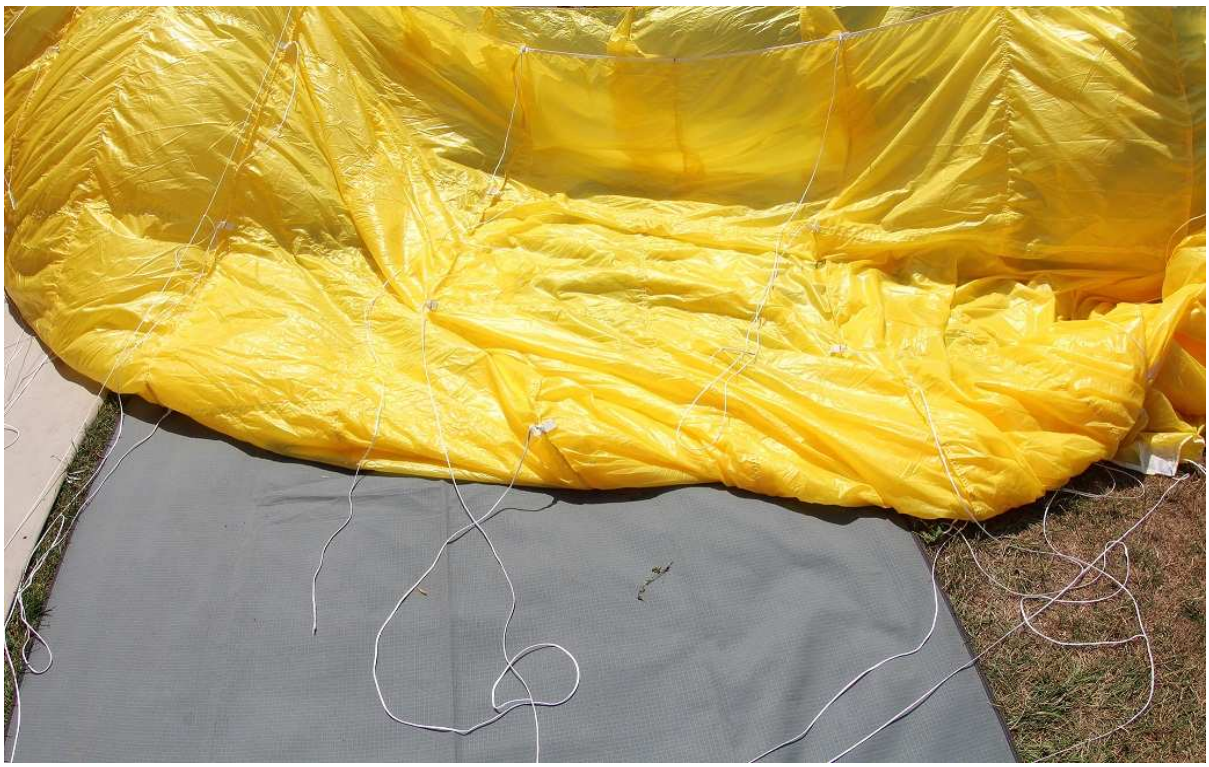
The parachutist fell into trees at the airport LZDB at increased speed of fall and sufferred a backbone injury at the impact.

1.2 Injuries to persons

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

1.3 Damage to parachute

Four cords of left front strap, the left control cord and a part of canopy of the reserve parachute got broken.



1.4 **Other damages**

The Aviation and Maritime Investigation Authority was not informed about circumstances with potential application of other claims for compensation of damages towards a third party.

1.5 **Information about parachutist**

Citizen of the Slovak Republic, aged of 40 years

holder of the parachutist licence No. 151/09, issued on 24.04.2009, with marked validity until 22.03.2013.

Qualitifcations: category „trainee“. Number of jumps: 28.

The named parachutist terminated the elementary AFF (acelerated free fall) training in October 2009. The parachutist made 9 jumps in 2010 and 5 jumps in 2011. In 2012 he started to jump on 11 May, when he made one assisted jump with AFF instructor. On the same day he made one unassisted jump, and another unassisted jump on 7 July 2012. On this day, during the second jump (Task No. 9 in AFF training „practice jump“, altitude of 4,000 m AGL), the critical accident occurred. The examiantion of training and parachutist documentation did not reveal any deficiencies in training.

1.6 **Information about parachute**

Type of parachute:	TELESIS, DP-260, PR-235
Packing with harness: Serial No:	TELESIS 7674
Reserve parachute: Serial No:	PR 235 044912, packed on 05.04.2012
AAD device: Serial No:	VIGIL II 18687
Main parachute: Serial No:	PD STUDENT 260, packed for jump on 07.07.2012 000597

1.7 Meteorological situation

Meteorological situation at the airport LZDB at the time of parachute accident was suitable for practising of the jumps in question and had no influence on occurrence of the accident.

Wind direction and speed: 40°- 60°, 5-6 m/s.

Type, quantity of clouds and cloud ceiling: CAVOK

1.8 Aids to navigation

Not applicable.

1.9 Communications

Not applicable.

1.10 Aerodrome information

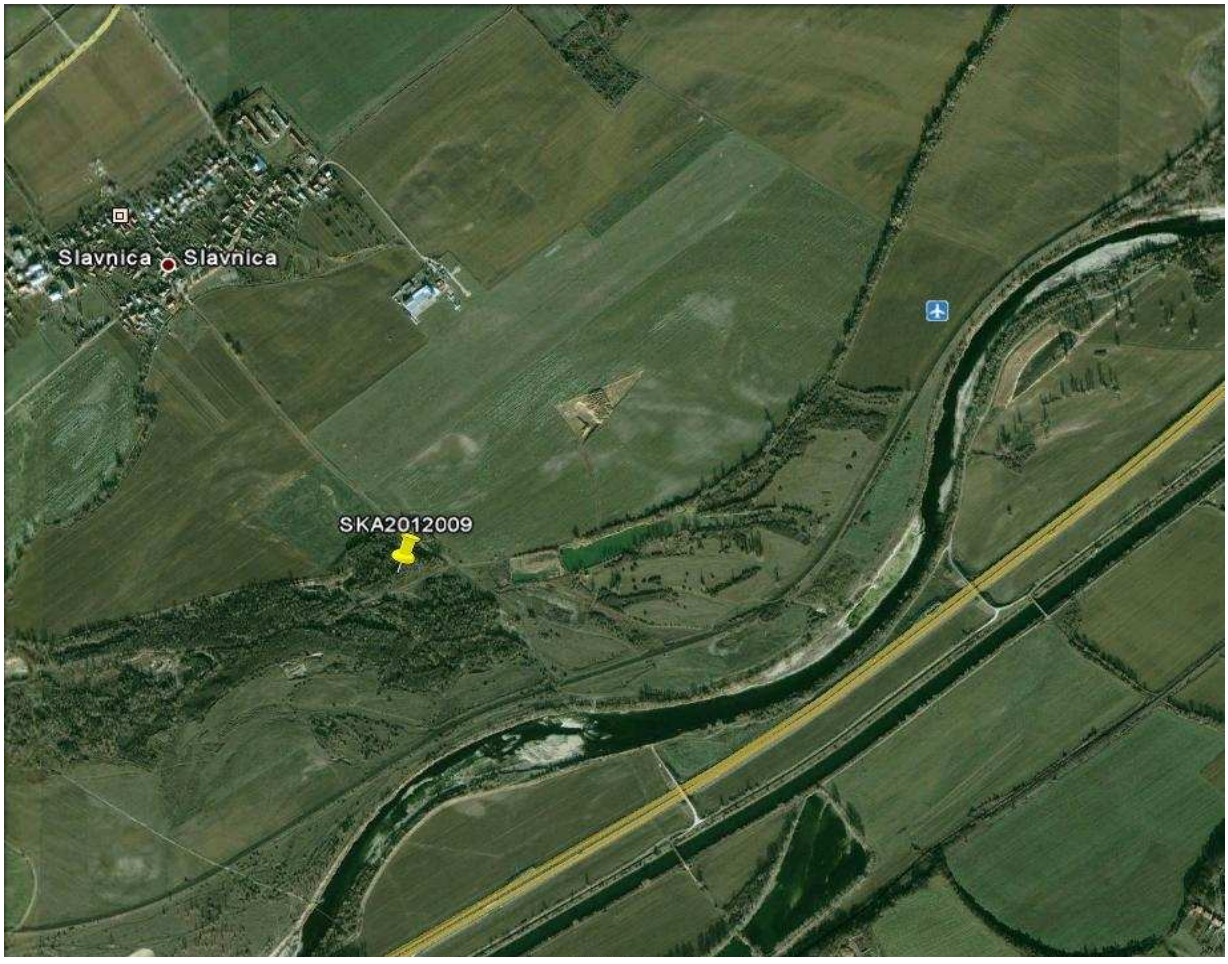
The airport LZDB is a public civil domestic aerodrome with irregular traffic. At the time of parachute accident it was suitable for parachute operations flights.

1.11 Flight recorders and other recorders

Not applicable.

1.12 Wreckage and impact information

The place of accident is delimited by the geographic coordinates:
N 48°59´28,68´´, E 18°11´14,54´´
It is situated in trees and shrubs south-west of the airport.



1.13 **Medical and pathological information**

Compressive fracture of vertebrae L1.

1.14 **Fire**

Not applicable.

1.15 **Survival aspects**

The search operations were not necessary.

1.16 **Tests and research**

Parachute equipment:

The visual check of harness with packing did not reveal any circumstances affecting the incorrect opening of reserve parachute. Neither had it revealed other damage causing the rupture of cords. The pin of release gear of reserve parachute contained a seal with marked date of packing and name of packer of the reserve parachute. In this context noncompliance with valid legislation for maintenance and packing of reserve parachutes was not detected.

The visual check of helmet and attachment of video camera GoPro did not detect any mechanical damage – burns on controlled parts indicating the locking of cords in the process of opening.

The parachute was equipped by safety device Vigil II. This safety device was correctly installed and switched in the mode „STUDENT“. The pyro cartridge was not activated, which is confirmed by the fact that the speed of fall 20 m/s had not been exceeded in the last 317 m AGL.

The extracting parachute of main parachute was correctly placed in its case. The verification of its function did not reveal any circumstances causing its extraction.

The subsequent check of function of the opening of the main parachute canopy did not detect any weaknesses, which means that it would be fully functional in case of use of the main parachute.

The overall examination of parachute documentation showed that parachute equipment was operated and maintained in accordance with valid legislation. No circumstances affecting the occurrence of the accident were detected.

1.17 **Organizational and management information**

The flight – parachute activity was carried out in accordance with flight regulations valid in the territory of the Slovak Republic.

The parachute operations were organised by the Aero Club Dubnica nad Váhom. The Act No. 83/1990 Coll. defines an aero club as a vonuntary association of citizens who carry out leisure and sports activities in powered and unpowered flying and in parachutism.
The aero club is voluntarily associated in a higher organisational unit - Slovak National Aero Club of the General M.R. Štefánik with seat in Žilina.

On the critical day the operations were started by the parachute jump manager and the flight manager signing the Parachute Jump Manager´s Book. The check of operations management did not reveal any circumstances affecting the occurrence of the accident.

1.18 **Additional information**

The investigation of causes of the accident did not detect any fault or influence of a third party and the parachutist on the occurrence of the accident.

1.19 **Useful or effective investigation techniques**

Standard investigation methods were used.

2. ANALYSIS

2.1. **Activity of pilot**

When making the jump the parachutist turned on his back in altitude of 1,900 m AGL. However, this altitude is sufficient for the parachutist to attempt to take the chest-first position pokus and to open the main parachute in the correct position.

The limit altitude for opening of the main parachute for this category of parachutist is 1,200 m AGL, which represented possible working range of altitude of 700 m and time 10-12 seconds for mastering of the position.

The limit altitude for opening of the reserve parachute is 500 m AGL.

The deformation of canopy caused the increase of the speed of fall of the parachutist.

Time of descent – fall from 1000 m AGL to the impact of the parachutist was 71 seconds, which represents a speed of 14 m/s (50 km/h).

3. C O N C L U S I O N S / CAUSE OF PARACHUTE ACCIDENT

3.1 **Findings**

- poor mastering of the free fall position and incorrect handling of the situation by the parachutist,
- absence of natural experiences of the parachutist from handling of situations arising during a free fall caused among others by long breaks between jumps,
- rupture of cords of the reserve parachute, followed by rotation and increased speed of fall,
- fall of the parachutist at an increased speed of fall into the trees.

The exact cause of rupture of the cords of reserve parachute canopy was not unambiguously determined by the day of issue of the final report. For the exact determination of the cause it will be necessary to obtain the opinion of the reserve parachute canopy manufacturer Performande Designs Inc., established in USA. One of possible causes of damage and rupture of the cords of the reserve parachute canopy could be their locking or friction on the parachutist harness in the process of opening in the unstable position on the back.

4. SAFETY RECOMMENDATIONS

On the basis of investigation of causes of the parachute accident

on **07.07.2012**

we recommend the following measures:

for the Aero Club Dubnica nad Váhom that organised the parachute operations at the airport LZDB:

- to make sure that the named parachutist is instructed that before the start of his practical activity with the parachute he is obliged to:
  - undergo examination from handling of extraordinary situations,
  - make repeated jumps in tasks III/4 to III/8 of Regulation V-PARA-2.
- to analyse the parachute accident with the parachute personnel of SNA during periodical training.

Bratislava, 20.08.2012