The original of the Final Report was issued in the Slovak language.
In case of inconsistency original version in Slovak language is applicable.

MINISTRY
OF TRANSPORT
AND CONSTRUCTION
OF THE SLOVAK REPUBLIC

AVIATION AND MARITIME INVESTIGATION AUTHORITY
Námestie slobody 6, P.O.BOX 100
810 05 Bratislava 15

F I N A L R E P O R T

on the safety investigation into a parachutist occurrence

of a parachute, type SKYMASTER 280

Reg. No.: SKP2017005

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

Operator:	Szkola Spadochronowa "Parapaltech" - Poland
Owner of the parachute:	private person
Organizer of parachute operation:	Aeroclub Spišská Nová Ves
Jumping Site:	Spišská Nová Ves Airport / LZSV
Flight phase:	jump
Site of parachutist occurrence:	210 m SSW from the left edge of the RWY30 threshold 48° 56' 15.18" N 20° 32' 20.87" E
Occurrence date and time:	26/8/2017, 14:30

Note: All time data in this report is reported in UTC time.

B. INFORMATION OVERVIEW

The parachutist performed a jump from the plane from a height of 3,600 m above ground level (hereinafter "AGL") together with her instructor. After a trouble-free jump and part of the free fall, she began to rotate. She opened the parachute during the rotation, trapping her foot in the lines of the main canopy, resulting in its deformation and malfunction. During the subsequent discharge of the malfunctioning main canopy, it did not fully detach from the parachutist's body. The backup parachute was opened by the AAD device. Both canopies became entangled during the subsequent opening of the backup parachute. The parachutist hit the airport ground in rotation, at an increased fall speed. Emergency medical assistance and air ambulance service were immediately called.

The parachuting occurrence was reported through the operator (the organizer of the parachute operation) to the Aviation and Maritime Investigation Authority of the Ministry of Transport and Construction of the Slovak Republic.

A commission was set up to investigate the causes of the occurrence:

Ing. Igor BENEK	Chairperson of the Safety Investigation Commission
Miroslav GÁBOR	Member of the Safety Investigation Commission

The report was issued by:

The Aviation and Maritime Investigation Authority
The Ministry of Transport and Construction of the Slovak Republic

C. MAIN PART OF THE REPORT

1. FACTUAL INFORMATION

1.1 History of the flight

On 26/8/2017, a parachute operation organized by Aeroklub Spišská Nová Ves was held at LZSV Airport in accordance with the Regulations for Airborne Activities (Amendment No.4/2010) and Directive V-PARA-1.

Airborne activities were carried out from a Cessna 182 type aircraft, registration mark OM-PAC, from a height of 3,600 m AGL.

Parachutists from the Republic of Poland also participated in the parachuting operation, performing sports jumps and training jumps with their instructors.

The injured parachutist performed her second jump on that day with her instructor during the ninth parachute flight. During the jump, they did the training task no. AFF-2 according to a directive approved by the authority of the Republic of Poland – Urzad Lotnictwa Cywilnego. It was a free fall jump, where the trainee jumps out with their instructor. The instructor holds their trainee during the jump, stabilizes their free fall and then releases them to perform the planned tasks.

After jumping from the aircraft from a height of 3,600 m AGL, the instructor stabilized the free fall of the parachutist and then let go of her. After the instructor let go of her, the parachutist started to rotate in her prone position and then got on her back, where she continued to rotate.

The instructor tried to fix his student’s situation several times by getting hold of her and then stabilizing her free fall. However, he was unable to do it due to the intensity of the rotation.

At an altitude of about 1,600 m AGL, the parachutist opened her main parachute. Due to the rotation on the back in the parachute opening process, a part of the carrying lines got caught on the parachutist's leg, resulting in the deformation and malfunction of the main canopy. She dealt with the situation by discharging the main canopy. Only one side of the main canopy was released on the side where there is no automatic opening of the backup parachute after the discharge of the malfunctioning main canopy.

The parachutist continued falling further in partial rotation on the deformed non-functional parachute down to a height of 317 m AGL, where the backup parachute was activated using the AAD device. When the canopy of the backup parachute was opened, it got entangled with the canopy of the main parachute.

The parachutist hit the airport ground in rotation on the entangled canopies of both parachutes at an increased falling speed.

Time period: day

1.2 Injuries of persons

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

1.3 Damage to the parachute

No damage to the parachute mechanism was detected when the parachute was completely checked.

1.4 Other damage

No circumstances have been reported to the Aviationl and Marine Investigation Authority, possibly with other claims for damage against a third party.

1.5 Personnel information

Parachutist-in-training:

citizen of the Republic of Poland, age 29, holder of the license: trainee.

Medical certificate: Oswiadczenie mediczne dated 28/7/2017.

Qualifications:
holder of the "trainee" performance category.

Experience:
total number of jumps: 13
of which: 7 static lines 6 AFF

Practical AFF training commenced on 28/7/2017.
The parachutist's training was performed on the basis of a license issued by the authority of the Republic of Poland - Urzad Lotnictwa Cywilnego, number: No 76RPS-10/2012/1.
Training documentation was submitted for the commencement and course of the parachutist's training.

Her previous jump took place on the day of the event, 26/8/2017.

Parachutist – instructor:

the instructor responsible for the training, the jump preparation and the assistance during the jump was an instructor, a citizen of the Republic of Poland.

Holder of parachute sports and instructor qualifications issued by the authority of the Republic of Poland – Urzad Lotnictwa Cywilnego.

Holder of performance category D, with validity until 27/6/2018.

Validity of authorizations:
Tandem pilot with indicated validity until 18/7/2018
AFF Instructor with indicated validity until 21/6/2019

When checking the personal documentation of the instructor as well as training documentation, there were no facts that could affect the occurrence of the event.

1.6 Information about the parachute

Main parachute:	SKYMASTER 288, packed for jumping on 26/8/2017
Serial Number:	139607, date of production June/1993
The harness container:	WINGS Student
Serial Number:	8697, date of production March/2011
Backup parachute:	Tempo 250
Serial Number:	157687, date of production July/1998
Packed on:	13/5/2017 validity until 10/11/2017
AAD device:	VIGIL II Multimode
Serial Number:	23885, date of production May/2011

1.7 Meteorological information

The meteorological situation at the LZSV Airport at the time of the parachutist occurrence was suitable for the performance of jumps in question and did not affect the occurrence of the occurrence.

Direction and wind speed: from the direction of 200°, 2 m/s.

Cloudiness type, amount and height: clear.

1.8 Aids to navigation

Not applicable.

1.9 Communications

Not applicable.

1.10 Information about the airport

The LZSV Airport is a public national airport with irregular traffic.
At the time of occurrence, it was suitable for parachuting operations.

1.11 Flight recorders and other recording devices

Not applicable.

1.12 Wreckage and impact information

Place of event – the parachutist crash-landed on the border of the LZSV airport grounds, 210 m from the left edge of the RWY30 runway threshold and is determined by geographical coordinates:
48° 56' 15.18" N 20° 32' 20.87" E.

1.13 Medical and pathological information

Parachutist suffered serious injuries.

1.14 Fire

None.

1.15 Survival aspects

It was not necessary to perform any investigation and rescue with SAR equipment.

1.16 Tests and research

Parachute mechanism

The harness and the parachute were checked:

when checking the harness of the parachute with the container, it was found that the main canopy release mechanism was lifted up to about 2/3 of its length, which was probably the cause of only the left side of the main canopy being discharged. The backup parachute release mechanism was located in the harness container. Its position showed the fact that the parachutist did not open the backup parachute manually.

When checking the cover part of the backup parachute, it was found that the security device's (AAD) pyropatron was activated, confirming the fact that at 317 m AGL, the parachutist fell at free fall speed of over 20 m/s.

In the overall inspection of parachute mechanism documentation, the Commission concluded that the parachute technology in question had been operated and maintained in accordance with current legislation and no facts that could have affected the occurrence of the occurrence in question were found.

1.17 Organizational and management information

Flight-airborne activities were performed in accordance with aviation regulations valid in the territory of the Slovak Republic.

The organization of the parachuting operation was performed by Aeroclub Spišská Nová Ves. Pursuant to Act No. 83/1990, Aeroclub is a voluntary association of citizens performing interesting and sporting activities in motor flying, non-motorized flying and parachuting.

The Aeroclub is voluntarily associated within a higher organizational unit - the Slovak National Aeroclub of Gen. M.R. Štefánik based in Žilina.

On the given day operation commenced with the signing of the controlled jump and the air traffic control manager in the Controlled Jump Log. No facts that could have affected of the occurrence were found within the investigation.

1.18 Additional information

When investigating the causes of the occurrence, no facts of the cause or effect of a third party on the occurrence were found.

1.19 Methods of safety investigation

Common investigation methods were applied.

2. ANALYSIS

Parachutist activity

After jumping from an aircraft from a height of 3,600 m AGL, the parachutist stabilized her free fall with the instructor's help. After the instructor let go of her, the parachutist started to rotate in her prone position and then got on her back, where she continued to rotate. She did not respond to the instructor's signals and could not stabilize her prone position without his help. In an unstable position – rotation, she continued down to a height of about 1,600 m AGL, where she decided to solve the situation by opening the main parachute. This procedure was inconsistent with the methodology and procedures that parachutists must observe when opening the main parachute. Due to the rotation on the back in the parachute opening process, a part of the carrying lines got caught on the parachutist's leg, resulting in the deformation and malfunction of the main canopy. She dealt with the situation by discharging the main canopy. Only one side of the main canopy was released on the side where there is no automatic opening of the backup parachute after the discharge of the malfunctioning main canopy, probably due to insufficient pull of the release mechanism during the discharge. The parachutist continued falling further in partial rotation on the deformed non-functional parachute down to a height of 317 m AGL, where the backup parachute was activated using the AAD device.

When the canopy of the backup parachute was opened, it got entangled with the canopy of the main parachute. The parachutist hit the airport ground in rotation on the entangled canopies of both parachutes at an increased fall speed.

3. CONCLUSION / Cause of Parachuting occurrence

Causes

- crash of the parachutist at an increased fall speed,

- failure to maintain a stable prone position during free fall,

- incorrect procedure when performing the discharge of the malfunctioning canopy.

4. SAFETY RECOMMENDATIONS

The final report from the investigation into the parachuting occurrence does not contain any recommendations.

In Bratislava, 19/1/2018