



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

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

Reg. No.: SKA2010021

FINAL REPORT

on investigation of an air accident
of powered hang glider **PROFI 14 TL / JOKER TRIKE**
Registration No. **OM - H737**

Date: 12.9.2010

Place: Partizánske – Airport Malé Bielice ("LZPT")

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, and in accordance with procedures for investigation of causes of air accident in the Light Aircraft Association of the Slovak Republic.

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.

Operator / Owner:	private person
Type of operation:	general aviation
Type of aircraft:	PHG - PROFI 14 TL / JOKER TRIKE
Registration No:	OM-H737



Take-off site:	LZPT
Landing site:	LZPT
Flight phase:	landing
Place of accident:	runway ("RWY")
	Approximate geographical coordinates of the place of accident: 48°37'13.36" N, 018°20'06.23" E
Date and time of detection of accident:	12 September 2010, 14:10 hrs

Note: All times in this Report are UTC.

B. INFORMATIVE SUMMARY

During landing approach of the powered hang glider ("HG") in the flare-out phase the glider wing sharply banked to the left side. The pilot reacted by levelling off the glider to the right. In this manoeuvre the glider lost the height, touched the ground with right wingtip and fell to the ground.

The wing of PHG was seriously damaged.

The landing gear of PHG was damaged in the nose section.

Nobody was injured.

An investigation board in the following composition was set up for investigation of the air accident:

Ing. GREGA Milan	chairman of the Investigation Board
TURAN Marián	member of the Investigation Board.

Invited experts and consultants of the Investigation Board:

TÓPFER Walter	consultant of the Investigation Board.
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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

The pilot of PHG was conducting flights on the traffic circuit of the Airport LZPT. On the critical day he conducted 37 starts and was conducting flights on the airport traffic circuit 25R, each flight taking approximately 5 to 7 minutes. The last flight, during which the accident occurred, took 7:35 and was conducted on the airport traffic circuit. During this flight the instrument cluster recorded maximum speed of 102 km/h and maximum altitude of 305 m GND. The flight was conducted in double occupancy. The weight of the pilot was 110 kg, the weight of the second person onboard PHG was 72 kg. At the time of accident PHG contained 15 l of fuel, 4 l of motor oil and 3.2 l of engine coolant. During the flight the pilot did not register any degradation in flying qualities or driving unit operation. The meteorological conditions were favourable and had no significant impact on the flight, although other participants of airport operation registered weak effects of random thermal air motion. The pilot of PHG was conducting landing on the runway 25R short after landing of other aircraft. In the flare-out phase the wing sharply banked to the left side. The pilot reacted by correction of the slope of wing to the right side. At the same time PHG lost the height, touched the ground with the right wing and turned by approximately 90⁰ (landing gear) - 180⁰(wing) to the landing direction. After the first contact of the right wingtip with the ground the nose of the landing gear and wing inclined forward, the right front end of landing gear and

the wing touched the ground and PHG turned over to the left side of the landing gear. The right front end of the landing gear was sliding on the ground, while the landing gear was turning around its front end. Finally PHG fully turned over to the left side of the landing gear to the wing, which stayed under the landing gear and the movement of PHG on the ground was terminated. In the levelling-off phase the pilot did not increase the engine power immediately, but with delay, and this intervention proved to be ineffective. After landing the rotating propeller touched the ground and the engine stopped. The pilot switched off the ignition, the main switch, and the crew got out of PHG unhurt.

Daytime: Daylight

On 12 September 2010 the air accident was reported to the Air Accident and Incident Investigation Board of the Ministry of Transport, Posts and Telecommunications Development of the Slovak Republic.

1.2 Injuries to persons

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

1.3 Damage to aircraft

The PHG wing was seriously damaged and its repair seemed to be ineffective. The propeller blades were damaged (split in the length). The PHG landing gear was damaged in the front section.



Fig. 1: Damaged PHG (picture taken after PHG positioning on landing gear wheels)

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

Citizen of the Slovak Republic aged of 37, holder of PHG pilot licence No. 2-016, issued by LAA SR on 23 March 2000.

Qualifications:

PHG pilot from 23 March 2000 with marked validity until 20 August 2010.

Medical certificate of 2nd class issued on 20 August 2008, with marked validity until 20 August 2010.

The licence was extended until 11 February 2013

Flying experience:

Total flight hours: 260:00 hrs
Total flight hours for previous 90 days: 7:00 hrs
Total flight hours for previous 90 days with the glider type: 7:00 hrs
Flight hours on the day of accident (incl. critical flight): 3:42 hrs (37 starts a 6 min)

1.6 Information about PHG

Type: PHG double-seated with landing gear (category FAI – RWL2),

PROFI 14 TL / JOKER TRIKE

Serial No.: Wing - 3945
Landing gear – H737

Year of manufacture: Wing 2008 / Landing gear 2007

Manufacturer: Wing: AEROS - Ukraine
Landing gear: JOKER TRIKE

Total flight hours from the year of manufacture: wing 50 h / landing gear 68 h 00 min.

Certificate of airworthiness OM-H737 valid until 31 December 2010.

Weight of PHG at the time of air accident:

Empty weight of PHG 211.00 kg
Weight of crew (110.00 kg + 72 kg) 182.00 kg
Weight of crew outfit 7.50 kg
Fuel, oil and cooling liquid 18.10 kg

Total weight of PHG at the time of accident: **418.60 kg**

Maximum permitted take-off mass of PHG according to the certificate of airworthiness is **450 kg**.

Weight of PHG at the time of accident was within the permitted range.

1.7 Meteorological situation

	02:00 p.m. ¹⁾	02:00 p.m. ²⁾	³⁾
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Wind (direction/speed)	260 ⁰ / 1 – 2 m/s	South-west /1m/s	---
Cloudiness	1/8	cloudless	---
Temperature/Pressure	21 ⁰ C / 1018hPa	20 ⁰ C	---

1) Data according to LZPT 2) Data according to witnesses

1.8 Aids to navigation

Not applicable.

1.9 Communications

Not applicable.

1.10 Information about take-off site

LZPT, runway 25R.

1.11 Flight recorders

Not applicable.

1.12 Wreckage and impact information

The place of accident is situated in the first third of the runway 25R at LZPT. A trail left by the sliding front end of PHG landing gear in the length of 6 m is visible in grass. The damaged PHG is situated approximately 5 m from this trail, with the PHG wing turned on the "back" (upper end of the wing facing the ground) in the direction of the runway 07 of LZPT and with the landing gear lying on the lower end of the wing and turned on its left side vertically to the direction of the runway 25R. The right front wing spar is destroyed in three points and the wing sail, its individual details and design details of the wing are substantially damaged. The landing gear is damaged in the front section. The fastening belts of the crew and the crew compartment are undamaged and in one piece. The individual propeller blades are situated on the boss, but were damaged by longitudinal splitting of the blades. Fuel, oil and coolant leaks in the ground did not occur. The wing shows signs of substantial damage when its repair seems to be ineffective. The landing gear is reparable in conditions of the manufacturer. After the accident the axis of the PHG system is situated 90°right from the axis of the runway 25R.

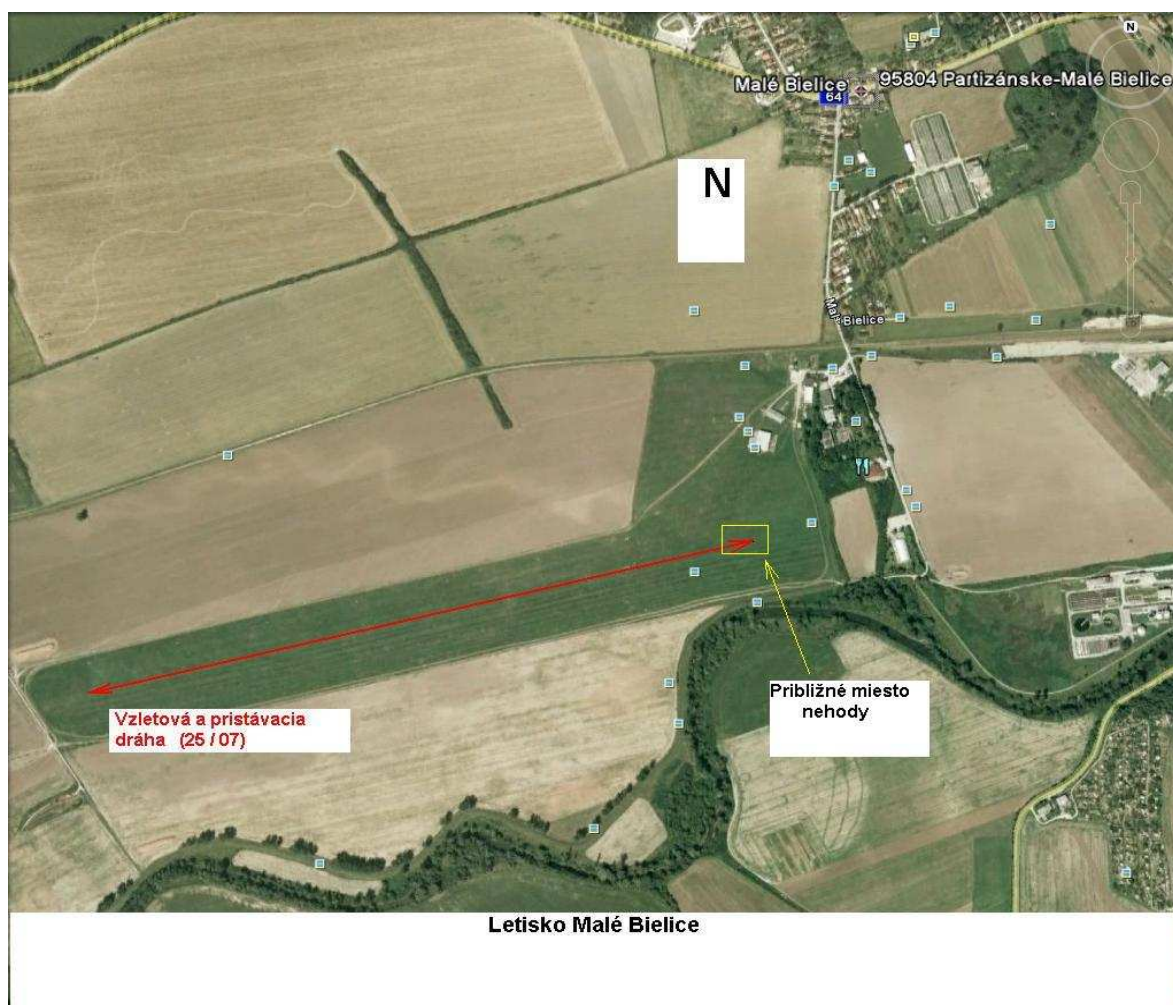




Fig. 3: PHG after accident (view in the direction of runway 25R)



Fig. 4: PHG after accident (airport buildings on the background)

1.13 **Medical and pathological information**

Not applicable.

1.14 **Fire**

Not applicable.

1.15 **Survival aspects**

Search and rescue were not required.

After the accident the pilot and the passenger got out of PHG unhurt.

1.16 Tests and research

Tests and research beyond standard basic investigation methods were not required.

1.17 Organizational and management information

Not applicable.

1.18 Additional information

- A) The pilot indicates in his statement that he reacted to the wing banking to the left in the flare-out phase by correction of the slope of the wing to the right and later increased the engine power. He was unable to describe the moment of impact to the ground because it happened very quickly. After the impact he switched off the ignition, turned the main switch off and got out of the PHG together with the second crew member. They suffered no injury.
- B) The witness indicates in his statement that the meteorological situation was almost ideal, with wind direction of 260° , wind speed of 1 – 2m/s, temperature of 21°C and maximum cloudiness of 1/8.
- C) The witness indicates in his statement that the pilot of PHG was conducting flights on the traffic circuit of the airport. He conducted 37 starts, each flight taking approximately 5 to 7 minutes. The last flight took exactly 7 minutes and 35 seconds, whereby maximum flight speed of 102 km/h and flight height of 305 m were registered. The witness read these data from the instrument cluster for indication of flight parameters. The witness did not notice any fuel or oil leaks on the place of accident immediately after the accident.
- D) The witness indicates in his statement that he landed with PHG immediately before PHG that had the accident. During flight he noticed slight effects of turbulence that was probably caused by higher atmospheric temperature. However the turbulence was not very intensive.
- E) The wing of PHG involved in the accident is of pole-free, highly efficient and classified in the certificate of airworthiness of SFV to the category of lowest passive safety – 3. Such classified wings are designed for use by experienced pilots.
- F) Since the year of manufacture the PHG had been flying with wing Profi 14. On 12 August 2008 this wing was replaced for wing Profi 14TL.

1.19 Useful or effective investigation techniques

Standard investigation methods were used.

2. ANALYSIS

The pilot of PHG was conducting very intensive flying activity at LZPT, with use of the runway 25R and the airport traffic circuit. He conducted 37 starts, always in double occupancy. During the critical flight the pilot registered aircraft – other PHG - landing before him. He evaluated the distance as safe, but because he knew flying qualities of his PHG as well as flying qualities of PHG flying in front of him, he realized different speeds of these PHG and that speed of his PHG was much higher than speed of PHG flying in front of him. But as he used the runway 25R reserved for powered aircraft, he did not change the direction of landing to the secondary runway and continued the flight in the initial direction. However, he probably evaluated this situation as more difficult and therefore subconsciously adjusted the speed of his flight to the lowest possible value in the final approach phase and maintained it until the phase of landing flare. In the phase of landing flare the flow speed of PHG wing further decreased, probably due to turbulence from PHG landing before him or due to thermal turbulence, which meant the decrease of speed at very low altitude to the stalling speed limit when the wing banked to the left side. The pilot reacted to this situation by primary correction of the slope of wing to the right side and only changed the flight speed by wing control and increase of engine power when the right wingtip touched the ground and when the PHG started to intensively change flight direction to the right side and to the ground.

3. CONCLUSIONS / Cause of air accident

Main cause of accident:

Loss of flight speed at the moment of landing flare.

Contributing causes:

- routine action of the pilot of PHG – decrease of the pilot's attention due to intensive daily flying and late reaction to correction of flight speed
- effects of turbulence on landing PHG from PHG landing before it.
- effects of thermal turbulence.

4. SAFETY RECOMMENDATIONS

On the basis of investigation of causes of the air accident of PHG type **PROFI 14TL / JOKER TRIKE**, registration No. **OM- H737** that occurred on **12 September 2010**

We recommend the implementation of the following measures:

1. Publication of results of investigation on the website of LAA SR
2. Analysis of air accident at the level of LAA SR (managed by the Air Operations Director / HIZ MZL) with special stress on the analysis of basic rules for correction of errors during flights on the aircraft traffic circuit.
3. To inform about causes of the accident through the Bulletin of LAA SR in printed and electronic form.

Prešov, 22 February 2011