MIMINISTRY 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.: SKA2010026

F I N A L R E P O R T

on investigation of an air accident

of aircraft type **Viper SD-4**

Registration No. **OM-M252**

Date: 29.10.2010

Place: Airport LZPT

A. **I N T R O D U C T I O N**

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.

Operator:	JASOB s.r.o., Tehelná 65/13A, 958 03 Partizánske
Owner:	ČSOB Leasing a.s., Panónska cesta 11 852 01 Bratislava
Type of aircraft:	Viper SD-4
Registration No:	OM-M252
Take-off site:	Airport LZPT
Flight phase:	landing
Place of accident:	Airport LZPT
Date and time of accident:	29.10.2010, 13:24 hrs

Note: All times in this Report are UTC.

B. INFORMATIVE SUMMARY

On 29 October 2010 the pilot was making training flights on a circuit for the purpose of his conversion to a different type of sport flying vehicle ("SFV"). After the landing the aircraft bounced and floated to the height of 1 m. Subsequently the aircraft landed on the front landing-gear leg and the propeller came into contact with the ground.

The air accident was reported by the Aero Club Partizánske to the rescue coordination centre and to the District Police Department in Partizánske.

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

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

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 29 October 2010 the pilot arrived in the airport LZPT to continue the practical training with aircraft type VIPER SD 4. The pilot attended the preflight briefing in presence of the designated instructor.

According to the pilot´s statements, he took over the aircraft, its outfit and documentation without weaknesses.

The pilot was making the last training flight on a circuit, where approach and landing budget were performed without errors. The aircraft landed on the runway 25 („RWY“) and after 15-20 m bounced and floated to the height of 1 m at low speed and with the joystick pulled back.

Then the aircraft landed hard on the front landing-bear leg and the propeller came into contact with the ground.

After landing the aircraft stopped on RWY with damaged front landing-gear leg and propeller.

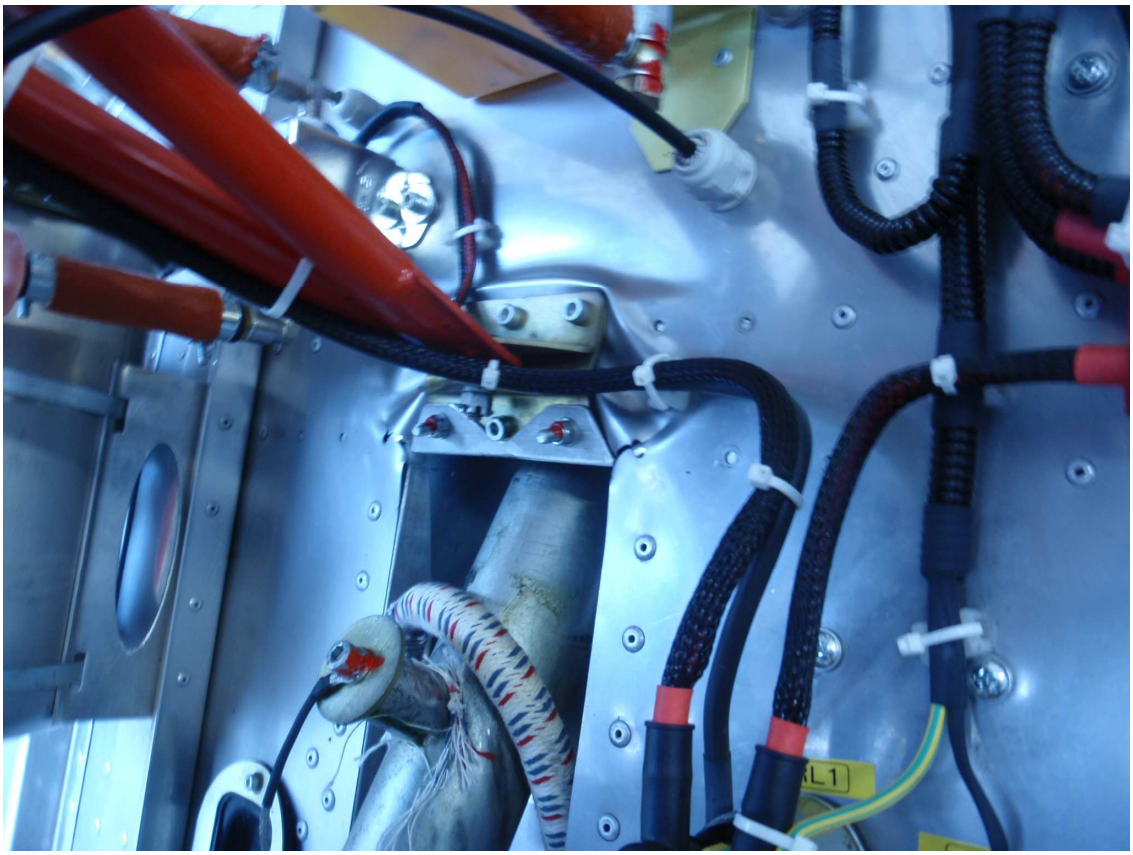
Daytime: Daylight
Flight rules: VFR

1.2 Injuries to persons

Injury	Crew	Passengers	Other persons
Fatal	-	-	-
Severe	-	-	-
Slight	-	-	-
No injury	1	-	

1.3 **Damage to aircraft**

Three-blade propeller – destroyed, fireproof bulkhead – damaged to a large extent, front landing-gear leg – destroyed, spring and damper unit of the front landing gear – destroyed, front wheel cover – destroyed. Inspection of the engine for damage due to the contact of the propeller with the ground.



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 58,
holder of the pilot licence No. UA280370 issued by the Light Aircraft Association of the Czech Republic with marked validity until 12 October 2012.

Holder of the pilot licence SFV No. 10S2010 issued by the Slovak Federation of Ultra-Light Flying of the Slovak Republic ("SFUL") as authorized organization of the Civil Aviation Authority of the Slovak Republic ("CAA") with marked validity until 12 October 2012. Date of first issue: 20.10.2010.

Qualifications: Pilot of SFV from 20 October 2010

Professional qualification for the type: ECHO 92, Viper SD-4 with marked validity until 12 October 2012.

Permanent limitation:
Performance of flights permitted under VFR conditions.

Temporary limitation:
Performance of lights permitted outside of districts of airports with controlled air traffic
Performance of flights only permitted in absence of the person without valid aviation
Temporary limitation cancelled from 20 October 2010.

Flying experience:

Total flight hours:	26:00 hrs and	172 flights
Total flight hours for previous 90 days:	10:20 hrs and	51 flights
Of which with aircraft of this type:	3:02 hrs and	17 flights
Flight hours on the day of accident (incl. critical flight):	1:32 hrs and	8 flights

Medical certificate of 2nd class with marked validity until 1 May 2011.

Restricted certificate of radiotelephone operator No. OFS II-88/2010.
Date of issue: 15 July 2010.

1.6 **Aircraft information**

a) **Airframe**

Type:	Viper SD - 4
registration No:	OM–M252
Serial No:	009
Year of manufacturer:	2008
Manufacturer until 12.08.2010:	Tomark, s r.o. Strojnícka 5, 080 01 Prešov

Total operating hours from year of manufacturer: 460:37 hrs and 1 719 flights.

Liability insurance valid from 23 July 2010 to 22 July 2011.

Aircraft station licence No: 1010791104 issued on 11 October 2010 with marked validity until 31 December 2015.

By its design and according to the approved flight manual, the aircraft was designated for sport and recreational flying and subsequently as training SFV for use in non-acrobatic operation.

The aircraft was put into operation on 30 April 2008 by issue of the certificate of airworthiness No. RS 091 and registration of SFV in SFUL according to the Authorization No. 3/2006 – P of the Civil Aviation Authority from 26 September 2006.

On 12 August 2010 the aircraft received a revised certificate of registration of SFV in SFUL according to the Authorization No. 3/2009-P of the Civil Aviation Authority with marked validity until 1 July 2011. By the change of registration data, Ing. Daniel Tomko, domiciled in Alexandra Matušku 13, 080 01 Prešov, became the aircraft manufacturer.

b) **Engine**

Type	ROTAX 912 ULS
Serial No:	5.650.482
Manufacturer:	BRP-ROTAX GmbH & Co. KG Welser Straße 32 A-4623 Gunskirchen, Austria

The engine was incorporated in the aircraft in the year 2008.

Total number of operating hours: 459:28 hrs and 1,715 flights.

Certificate of airworthines No: RS091 issued by SFUL, with marked validity until 1 July 2011.

c) **Propeller**

Type:	AS1730/1950-2
Serial No:	62/184,185,186
Manufacturer:	PESZKE-AERO TECHNOLOGIES

The propeller was incorporated in the aircraft on 12 August 2010.

Total number of operating hours: 09:37 hrs

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

Empty weight of aircraft		332.9 kg
Weight of crew		89.0 kg
Weight of baggage		2.0 kg
Weight of fuel	cca 42 l x 0.72 kg/l	30.3 kg
Weight of oil	cca 3 l x 0.90 kg/l	2.7 kg
Total weight aircraft at the time of accident:		456.9 kg

Maximum permitted take-off mass of aircraft according to the flight manual is 560 kg.

1.7 Meteorological situation

Weather at the time of accident: cloudless, calm, visibility more than 10 km.
The critical flight of the aircraft Viper SD-4, identification No. OM–M252, was made in an environment that can be characterized from the meteorological view as stable weather – without precipitation and with excellent visibility without meteorological effects likely to negatively affect the flight of the aircraft.

On this basis it can be concluded that meteorological conditions at the time of air accident could not have participated in its occurrence.

1.8 Aids to navigation

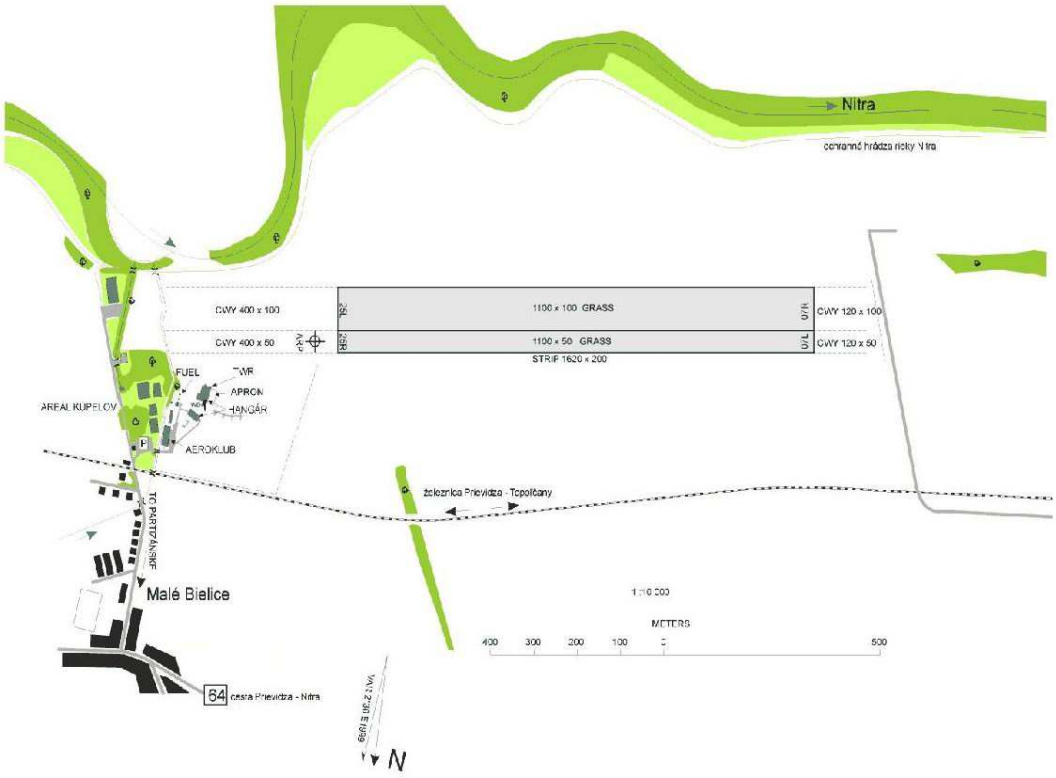
The aircraft was equipped for VFR flights.

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

The airport LZPT is a public domestic aerodrome with grass surface and dimensions of 07L/25R 1100x50 m and 07R/25L 1100x100 m. At the time of accident it was operable and suitable for take-offs and landings of the said aircraft type.



1.11 Flight recorders

The aircraft was not equipped by flight recorders.

1.12 Wreckage and impact information

Not applicable.

1.13 Medical and pathological information

Not applicable.

1.14 Fire

Not applicable.

1.15 Survival aspects

Search and rescue using SAR means were not required.

1.16 Tests and research

At the time of accident the pilot was not under influence of alcohol that may have decrease his attention during the flight.

1.17 Organizational and management information

The authorization No. 3/2009-P issued by the Civil Aviation Authority according to Art. 48 (3) of the Act No. 143/1998 Coll. on Civil Aviation ("Civil Aviation Act") to the organization SFUL, extending the scope pursuant to the REGULATION (EC) No. 216/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, ANNEX II c) aircraft of which at least 51 % is built by an amateur, or a non-profit making association of amateurs, for their own purposes and without any commercial objective, up to MTOMmax = 560 kg, was non-compliant with the outdated Directive SM -12, where SFV means aircraft of special category equipped by not more than one piston driving unit, that by its design, flying characteristics, performance and

control mode substantially differs from aircraft of standard categories. By decision of the Civil Aviation Authority the following SFV are classified to the category of SFV:

- Hang-gliders
- Powered hang-gliders
- Paragliders
- Powered paragliders
- Micro light sailplanes
- Gyroplanes
- Sport parachutes
- Micro light planes

The Directive SM12 provides that micro light planes are classified to the category of SFV on the basis of limited maximum také-off mass of 450 kg.

The Directive SM12 further provides that the authorized person has the right to grant exemptions from the provisions of own directives only if the latters are more severe than valid aeronautical standards and directives, up to the limits specified therein. If these special conditions does not deal with potential cases arising during construction or operation of SFV, the Civil Aviation Authority has the right to interpret the wording of the special conditions and the right to decide.

The operation of a non-approved SVF (Viper SD-4 in the weight category above 450 kg is approved by the authorized organization beyond the scope of valid regulations in SR) constitutes the breach of the Civil Aviation Act and the Regulation.

The authorization No. 3/2009-P issued in accordance with competences and scope of authorizations determined by the Civil Aviation Act (Art. 48 and Art. 2c), where SFV is defined as aircraft of special category designed for air sport and recreational flying, the construction and operation of which is subject to special conditions determined by the Civil Aviation Authority in accordance with this Act, did not take into account the need for amendment of valid conditions and the Civil Aviation Authority did not perform a thorough review of valid directives at SFUL.

The authorization No. 3/2009-P extends the competences of SFUL in accordance with conditions laid down by the REGULATION (EC) No. 216/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on common rules in the field of civil aviation, where CHAPTER II SUBSTANTIVE REQUIREMENTS, Article 4 Basic principles and applicability, paragraph 1 provides that:

Aircraft, including any installed product, part and appliance, which are:

(a) designed or manufactured by an organisation for which the Agency or a Member State ensures safety oversight; or

(b) registered in a Member State, unless their regulatory safety oversight has been delegated to a third country and they are not used by a Community operator; or

(c) registered in a third country and used by an operator for which any Member State ensures oversight of operations or used into, within or out of the Community by an operator established or residing in the Community; or

(d) registered in a third country, or registered in a Member State which has delegated their regulatory safety oversight to a third country, and used by a third-country operator into, within or out of the Community

shall comply with this Regulation.

The REGULATION (EC) No. 216/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL in CHAPTER II SUBSTANTIVE REQUIREMENTS, Article 4 Basic principles and applicability, paragraph 4 provides that paragraph 1 (quoted above) shall not apply to aircraft referred to in Annex II to this Regulation.

Annex II to the REGULATION (EC) No. 216/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL provides that:

Article 4 (1) do not apply to aircraft falling in one or more of the categories set out below:

c) aircraft of which at least 51 % is built by an amateur, or a non-profit making association of amateurs, for their own purposes and without any commercial objective;

e) aeroplanes, helicopters and powered parachutes having no more than two seats, a maximum take-off mass (MTOM), as recorded by the Member States, of no more than:

- 300 kg for a land plane/helicopter, single-seater; or

- 450 kg for a land plane/helicopter, two-seater; or

- 472,5 kg for a land plane, two-seater equipped with an airframe mounted total recovery parachute system,

- 315 kg for a land plane single-seater equipped with an airframe mounted total recovery parachute system,

and, for aeroplanes, having the stall speed or the minimum steady flight speed in landing configuration not exceeding 35 knots calibrated air speed (CAS).

This extension of the scope of SFUL activity was not reflected in the change of its regulatory basis, amendment of national requirements, or in planning and supervisory activity of the Civil Aviation Authority.

1.18 **Additional information**

The cub pilot started the training at LZPT in the air space of SR on **2 May 2010** at the Czech company FAIR, s.r.o. with UL aircraft P92 ECHO, identification No. OK-BUU 45, on the basis of permission issued by the Civil Aviation Authority for flights in the air space of SR in the period **between 1 April 2010 and 31 December 2010** within the scope of validity of required documents and under conditions of compliance with regulations valid in SR.

The pilot - instructor was obliged, on the basis of the permission issued by the Civil Aviation Authority, to start the flight operations with the aircraft in question in the air space of SR in the period **between 1 October 2010 and 30 September 2011** within the scope of validity of required documents and under conditions of compliance with regulations valid in SR.

Subject to the fulfilment of conditions within the scope of valid directives, the Czech company FAIR, s.r.o. was obliged to draw up and maintain the training programme within the required scope according to the SFUL Regulation 5/2000 of 21 January 2000, containing the curricula for the training of aviation personnel of SFV of micro light plane type ("ML") on the basis of the Authorization No. 3/1999 – P of the Civil Aviation Authority of 31 August 1999. This authorization was invalid at the time of aviation training.

1.19 Useful or effective investigation techniques

Standard investigation methods were used.

2. ANALYSIS

2.1. **Flight history**

The pilot was making training flights on a circuit as a part of his practical conversion to the new aircraft type Viper SD-4.

The pilot landed with the aircraft on the runway. When rolling on the runway, after some 15-20 m the aircraft bounced up to the height of 1 m, probably due to the unevenness of RWY without sufficient speed for the flight.

The pilot did not master the flying technique after the uncontrollable bounce with subsequent hard landing on the front landing-gear leg.

2.2. **Training**

The investigation board did not examine the previous theoretical preparation that comprises the ground preflight briefing, instruction on keeping the technical and flight documentation, as well as the use of instruction means and their correct application in the education process.

The training of the cub pilot was not in compliance with the Curriculum for the Training of Cub Pilots and Pilots of ML, which is the basic document for training of aviation personnel of SFV – ML, where the number of flights and flight times contained in the individual training units represent the necessary minimum and further training is possible when the cub pilot has safely mastered the content of the previous training unit, because according to the submitted documentation the procedure, the period and the number of flights in the individual training units were not observed.

The Directive No. 5/2000 provides that the scope of pilot´s examination is determined by the inspector, but at least within the scope of:

- Three flights on a circuit
- Examination from flying technique in the space (at least 15 min)
- Examination from navigation of ML on the track (at least 150 km).

Based on submitted documentation, the cub pilot terminated the training by passing the pilot´s examination at the airport LZPT on 9 September 2010 at the company FAIR, s.r.o. with UL aircraft P92 ECHO, identification No. OK-BUU 45, within the scope of 3 flights and 35 minutes, which is not in compliance with the Curriculum for the Training of Aviation Personnel.

The designated instructor is obliged to ensure that the applicant under his lead gains experiences in all areas required for granting of the pilot licence.

The investigation board did not receive any relevant documentation specifying the curriculum according to which the training was conducted and the person who supervised the training activities.

The Light Aircraft Association of CR issued to the pilot the pilot licence that the authorized organization SFUL validated without temporary limitations issued the SFUL licence to the pilot. The investigation board did not receive any relevant document specifying the procedure of validation of the pilot licence between the Czech Republic and the Slovak Republic and the person verifying the level of pilot´s training and experience.

On 22 October 2010 the pilot with validated licence of the authorized organization SFUL started the practical conversion training for navigation of aircraft VIPER SD-4, that was not compliant with the curriculum of practical conversion training. The pilot underwent practical

training with aircraft with maximum take-off mass up to 450 kg, followed by conversion training for aircraft type with maximum take-off mass up to 560 kg.

The Directive 5/2000, Title 4 "Curriculum of conversion training for other types of SFV – ML" provides that conversion training contains theoretical and practical parts, with theoretical part comprising the training in flight manual of given type and in technical description, including performance of preflight inspections. It also includes acquisition of information about characteristics of all regimes of flights on a circuit and in the space during flight, start and landing.

The training can be provided by a technician, inspector, instructor of SFUL, or authorized operator of the respective ML, who will enter this training in the flight logbook. The theoretical part of the training can be provided directly in the cockpit.

Based on the certificate of registration of SFV in SFUL, the company JASOB s.r.o. became operator of SFV on 12 August 2010.

The investigation board did not receive any relevant document including the entry of this training and the flight logbook did not contain the required information about provision of this training.

3. C O N C L U S I O N S

3.1 Findings

Based on the expert investigation the investigation board concluded that the pilot probably had not acquired the required habits during the practical training for issue of the pilot licence due to the inconsistent provision of the practical training. By the following inconsistent conversion training for a new aircraft type the pilot probably did not acquire sufficient knowledge required for making independent flights on the respective aircraft type.

The investigation board did not obtain any relevant reports on design changes carried out on the aircraft type VIPER SD-4 after 1 January 2009, that would have allowed to increase the aircraft mass from 450 kg to 560 kg.

The investigation board did not obtain any document on construction of aircraft above 450 kg and any other report such as basic aerodynamic calculation of SFV.

3.2 Causes of air accident:

The pilot did not master the flying technique following the aircraft bounce or try to correct the error when the aircraft floated to the height and kept the joystick pulled back. When the aircraft lost the flight speed, it tilted over to its nose and landed hard on the front landing-gear leg.

4. SAFETY RECOMMENDATIONS

On the basis of investigation of causes of the air accident of the aircraft type Viper SD-4, registration No. OM–M252, from 29 October 2010,

We recommend the adoption of the following measures:

1) We recommend the implementation of analysis of the critical air accident by the authorized organization SFUL with flight and technical personnel at the operators of the respective aircraft type.

2) We recommend to the authorized organization SFUL to harmonize the regulatory basis with regulations valid in the Slovak Republic and to put special stress on all areas referred to in the authorization.

3) We recommend to the Civil Aviation Authority to harmonize the Authorization No. 3/2009-P with the REGULATION (EC) No. 216/2008 of the EUROPEAN PARLIAMENT AND OF THE COUNCIL, the Act No. 143/1998 Coll. on Civil Aviation and the Directive SM-12 Special conditions for construction and operation of sport flying vehicles, together with planning and execution of supervisory activity, in order to ensure safety of SFV operation.

Bratislava, 23 March 2011