



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.: SKA2011017

FINAL REPORT

on investigation of air accident
of aircraft **TATRA T-101**
Registration No. **OK-TAO**

Date: 23.09.2011

Place: Airport Žilina / LZZI

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 and in accordance with the Regulation (EU) of the European Parliament and of the Council No. 996/2010 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

Owner / Operator:	Ing. Ivo SKLENÁŘ and Ing. Jiří SKLENÁŘ, Slovácký aeroklub Kunovice, o.s.
Type of aircraft:	TATRA T-101
Aircraft registration No:	OK-TAO



Take-off site: Airport Kunovice („Airport LKKU“)
Planned place of landing: Airport Žilina („Airport LZZI“)
Flight phase: landing
Place of air accident: N 49°13'59.33", E 18°36' 44.11"
Date and time of air accident: 23.09.2011, 12:10 hrs

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

B. INFORMATIVE SUMMARY

On 23.09.2011 at 12:10 hrs aircraft Tatra T-101, registration No. OK-TAO, made a landing at Airport LZZI, on the runway 06 („RWY“). After landing the aircraft turned to the left, making repeated oscillations around the axis of RWY from the left to the right. In the final phase of landing run the aircraft approached the left edge of RWY, where it turned by 360° and stopped inclined to the left side, with its left wing touching the surface of RWY.

No crew members or other persons were injured. The pilot and passengers left the cabin on their own, without injuries.

An investigation commission for investigation of causes of the air incident was set up:

Ing. Igor BENEK

Ing. Zdenko BIELIK

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 23.09.2011 the pilot with passengers was making a landing with aircraft, registration No. OK-TAO, at the Airport LZZI. According to the pilot's statements the final approach was normal. The landing itself was made without hard impact in the RWY centre. After landing the pilot did not manage to keep the aircraft in the direction of axis of RWY and the aircraft started turning to the left with subsequent multiple oscillations from the left to the right side. These oscillations around the longitudinal axis were terminated near the left edge of RWY, where the aircraft turned around its vertical axis by an angle of 360° at minimum speed of advance and stopped inclined to the left wing. The left leg of landing gear broke off the anchorage and the right leg of landing gear got bent.

Neither the pilot nor the passengers were injured in the accident and left the aircraft on their own.

The rescue and fire service (ZHS) of the Airport LZZI arrived at the place of accident. The members of ZHS detected a minor leakage of fuel from drain pipe that they captured in a bucket. Afterwards they marked and secured the place of accident in cooperation with ÚLO.

The persons present at the airport reported the air accident by phone to the police and the Aviation and Maritime Investigation Authority of MoTCRD SR.

Daytime: Day
Flight rules: VFR

1.2 Injuries to persons

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

1.3 Damage to aircraft

The aircraft was minor damaged in the air accident.

The left leg of landing gear got partially broken off the suspension, the first leg of landing gear got bent to the right side. No other damage to the aircraft was detected.





1.4 Other damages

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

Airport company Letisková společnost Žilina a.s. suffered no damage to property.

1.5 Personnel information

Pilot: Citizen of Czech Republic, aged of 48

Holder of the airline transport pilot licence CZ/ATPL(A) No.: CZ/001044523, issued by the Civil Aviation Authority of CR on 13.10.1995, with marked validity until 11.10.2015.

Medical certificate of 1st class with marked validity until 27.01.2012.

Total flight hours before the air accident 12,292 h 48 min.

1.6 Aircraft information

Airframe:

Type:	Tatra T-101
Registration No.:	OK-TAO
Serial number:	02
Year of manufacture:	2008
Manufacturer:	Ing. Ivo Sklenář and Ing. Jiří Sklenář.

Special certificate of airworthiness No. ZOLZ-5394/3, issued by the Civil Aviation Authority of CR on 01.12.2010. Verification of airworthiness with marked validity until 23.02.2012.

Total number of flight hours since manufacture: 127 h 41 min.

Engine:

Not applicable.

Propeller:

Not applicable.

1.7 Meteorological situation

Sky clear, visibility distance above 10km, wind calm.

Meteorological conditions in the place and time of accident had no influence on the occurrence of the air accident.

1.8 Aids to navigation

Not applicable.

1.9 Communications

The aircraft was equipped by radio communication system Bendix/King Ky 96A enabling two-way radio communication at every moment of flight with all air stations.

1.10 Aerodrome information

The Airport LZZI is a public international airport for air traffic. At the time of air accident it was operable and suitable for take-off and landing of the aircraft type.

1.11 Flight recorders and other recorders

Not applicable.

1.12 Wreckage and impact information

After landing the aircraft stopped near the left edge of RWY, inclined to the left side, leaned against the end of its left wing.

The final position of the aircraft after the accident was documented, including elaboration of photodocumentation.





1.13 **Medical and pathological information**

Not applicable.

1.14 **Fire**

No fire broke out.

1.15 **Survival aspects**

The search and rescue operations were not required.

1.16 **Tests and research**

The failure of attachment of the aircraft landing gear was subject to an expertise at the Faculty of Mechanical Engineering of the Technical University in Brno, Institute of Material Sciences and Engineering.

From conclusions of the expertise it ensues that breaking of attachment was caused by static failure and heavy contamination of steel used (woody fracture) and structural cut (failure on the weld / basic material interface, in the heat affected zone).

1.17 **Organizational and management information**

Not applicable.

1.18 **Additional information**

The employees of OHS Department of Letisková spoločnosť Žilina, a.s. and members of the Police of SR put the pilot to a breath test for presence of alcohol with a negative result.

1.19 **Useful or effective investigation techniques**

Standard investigation methods were used.

2. **ANALYSIS**

2.1 **Activity of the pilot**

The pilot landed with the aircraft in the RWY centre, having observed the prescribed parameters of the rate of descent and approach and landing speed. But after landing the pilot was unable to keep the direction of RWY axis and the aircraft turned to the left edge of RWY. The critical situation probably occurred due to the pilot's reaction to initial aircraft drifting away from the direction, when he changed the direction to the right in the effort to keep the aircraft on RWY. Oscillations around the longitudinal axis of RWY repeated several times before the aircraft stopped near the left edge of RWY.

The circumstances show that at one of the initial drifts of the aircraft material, that was used for fastening of the landing gear leg to the wing beam, did not stand the alternate strong bending load acting in several directions and during oscillations of the aircraft around the RWY axis the breaking strength of material used was exceeded in the point of suspension of landing gear, which caused a **static failure**. This failure most probably did not occur at once, but during oscillation movements of the aircraft around the RWY axis, which developed gradually. This assertion corresponds with the pilot's statement on the impossibility to keep the required direction of movement, which could have been caused by the fact that after occurrence of failure the landing gear leg was not fixed in the suspension any more, because it was partially released in the joint and so could make a partial oscillating movement, which made it difficult for the pilot to keep the direction of movement. This failure developed to a total interruption in the point of attachment of the left landing gear leg pipe with the wing and subsequent breaking-off of the landing gear leg in the direction of the aircraft body, turning of the aircraft by an angle of 360° and its stopping.

3. CONCLUSIONS / CAUSE OF AIR ACCIDENT

3.1 Findings:

- the pilot had valid qualifications for making the critical flight
- the aircraft had valid documentation and did not show any faults before the accident
- the aircraft fulfilled the conditions of airworthiness before the critical flight
- the aircraft was slightly damaged in the accident
- nobody was injured in this accident.

3.2 Causes of air accident:

- unsuitable material used for attachment of landing gear legs to the wing.
- landing on a RWY with concrete surface
- failure of the pilot to keep the direction of aircraft after landing and subsequent oscillatory movements on RWY caused an excessive bending load, which the material used could not stand on a concrete surface and a static failure occurred.

4. SAFETY RECOMMENDATIONS

On the basis of investigation of causes of the air accident involving

Aircraft type **TATRA T 101**
Registration No. **OK - TAO**
Date of accident: **23.9.2011**

We recommend the aircraft operator to adopt the following measures:

- to analyse the air accident with flight personnel
- to consider the aircraft operation from concrete aprons
- to use more suitable material for landing gear anchorage.

Bratislava, 22.12.2011