MINISTRY OF JUSTICE OF THE REPUBLIC OF LITHUANIA
TRANSPORT ACCIDENT AND INCIDENT INVESTIGATION DIVISION

Accident to an aircraft PZL-104 Wilga-35A, national and registration markings LY-AGB, that occurred on 27 June 2017 in Paluknys aerodrome, Vilnius district, the Republic of Lithuania,

SAFETY INVESTIGATION REPORT

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Safety investigation and its report

The safety investigation is conducted in accordance with Annex 13 to the Convention on International Civil Aviation and Regulation (EU) No 996/2010.

The purpose of the safety investigation is to prevent the occurrence of accidents and incidents in the future, rather than establish blame or liability. The safety investigation is conducted independently of any judicial or administrative proceedings, to apportion blame or liability, are not related to them, and have no impact thereupon.

Each safety investigation shall be concluded with a report in a form appropriate to the type and seriousness of the accident or serious incident. The report shall contain, where appropriate, safety recommendations, which shall in no case create a presumption of blame or liability for an accident or serious incident.

The safety investigation report cannot be used as evidence in a judicial or administrative process seeking to apportion blame or liability, because this was not established in the course of the safety investigation and it is not compatible with the objective of the safety investigation.

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This is a courtesy translation of the safety investigation report. As accurate as the translation may be, the original text in Lithuania is the authentic version and the work of reference.

Data of accident

Date	27 June 2017	
Local Time	12.10 hrs.	
Location	Paluknys aerodrome, Vilnius district	
Aircraft Type	PZL-104 Wilga-35A	
Registration	LY-AGB	
Serial No.	15810581	
Year of Manufacture	1981	
Type of Flight	Towage of the glider	
Nature of Damage	Substantial damage	
Persons on Board	Crew – 1	Passengers – None
Injuries	Crew – None	Passengers – N/A
Commander's Licence	–	
Commander's Age	71 years	
Commander's Flying Experience	1573 hours	

Synopsis

At 12.10 hrs. on 27 June 2017, upon the landing of the aircraft PZL-104 Wilga-35A the person who was piloting the aircraft could not to keep the aircraft taxiing direction. The aircraft taxied through the ploughed part of the aerodrome and turned over the front at a slope. The person who was piloting the aircraft was not injured. The aircraft was substantial damaged.

Notification

The Investigator-in-Charge of Aircraft Accidents and Incidents was informed about the accident of the aircraft PZL-104 Wilga-35A, registration LY-AGB, by Vilnius Aero Club at 13:27 hrs on 27 June 2017.

1. FACTUAL INFORMATION

1.1. History of the flight

On 25 June to 8 July 2017, Paluknys aerodrome of Vilnius Aero Club hosted the Lithuanian Club Class Gliding Championship. PZL-104 Wilga-35A aircrafts were used to for towing the gliders.

The person who piloted the aircraft stated that on the morning of 27 June 2017 he performed a pre-flight check of the aircraft PZL-104 Wilga-35A. Regarding that the pilot of the aircraft had not arrived yet, he taxied the aircraft to the gliders to be towed. When he saw the hands raised by the glider accompanying person meaning that the glider was prepared for towing, he taxied up to the glider and took-off it to the air. The glider disengaged at a height of 600 m and the person who was piloting the aircraft immediately descended to the third turn of the right traffic circuit of the runway (magnetic heading 179°). At the aerodrome, the aircraft landed at 12.10 hrs. at around 50 m before the slope and at a distance of 10 m from the ploughed part of the aerodrome. The person who was piloting the aircraft claimed that there was gusty wind with a direction 240–270°, a gust of which into the right side of the aircraft during taxi caused the aircraft to turn to the right. Neither the rudder nor the braking of the left wheel helped keeping the aircraft taxiing direction and the aircraft taxied out to the ploughed part of the aerodrome. The wheels of the aircraft got stuck in soft soil and the aircraft slowly turned over. The person who was piloting the aircraft turned off the engine and magnets and disembarked from the overturned aircraft through the door at the left side. The person who was piloting the aircraft did not suffer any injuries.

A witness of the accident, the pilot of another aircraft PZL-104 Wilga-35A who was flying behind, noted that there was strong and gusty wind but the aircraft's approaching to descend and descending were performed well. The aircraft landed at a distance of around 10 m from the ploughed part of the aerodrome. Then, after taxiing to an extent of around 50 m, it suddenly turned to the ploughed part of the aerodrome and taxied through it until slowly turning-over the front at a slope.

1.2. Damage to aircraft

The turning-over of the aircraft caused the deformation of the frontal and central parts of the fuselage of the aircraft, engine cowlings, vertical stabiliser and rudder, slats, bending of the pilot's cockpit door and breaking of its window, braking of the engine propeller, etc. (Fig. 3).

1.3. Personnel information

The person who was piloting the aircraft was a 71-year-old citizen of the Republic of Lithuania, who did not have a pilot's licence and a medical certificate at the time of the accident. On 29 September 1993, the Ministry of Transport and Communications of the Republic of Lithuania issued him a commercial aviation pilot licence, which was valid until 27 May 1998.

The total flight experience of the person who was piloting the aircraft, which he acquired in 1968-1998, amounted to 1573 hours, including 900 hours of piloting the aircraft PZL-104 Wilga-35A. The pilot logbook of the person who was piloting the aircraft indicated that the additional flight time was around 1 hour each year after 1998.

The person who was piloting had a maintenance technician/engineer licence issued 15 March 2016 by the Civil Aviation Administration and valid until 15 March 2021. It listed the aircraft PZL-104 Wilga-35A rating.

1.4. Aircraft information

1.4.1. Information of aircraft

Table 1. General information of the aircraft PZL-104 Wilga-35A

Owner	Department of Physical Education and Sports under the Government of the Republic of Lithuania
Operator	Vilnius Aero Club
Certificate of Registration issue date	13 April 2011
Certificate of Airworthiness issue date	21 June 2010
Certificate of Airworthiness Review issue date	20 June 2017
Certificate of Airworthiness Review valid	19 June 2018
Total flight hours	2639 hrs. 31 min.
Flight hours after the last periodic inspection	1 hrs. 53 min.

1.4.2. Limitations and operation of aircraft

The Flight Manual for the aircraft PZL-104 Wilga-35A approved on 16 April 1976 (issue A) indicates:

'2.5. Other limitations
<…>
3. It is forbidden to carry out the following:
a – take-off and landing when the side component of wind velocity/ square to the longitudinal axis of the aircraft/ exceeds 6 m/sec.
<…>
4.12. Landing
<…>
2. The introduced landing gear system of the aircraft provided with a tailwheel makes it advisable to follow a specified landing technique /particularly on hardened airstrips an under cross wind conditions/. It is thus recommended to touch down possibly in a three-point configuration with rudder in center position. After touchdown pull the control stick fully backward and keep to course by means of the rudder and brakes.
<…>
4. Landing in head-wind of up 15 m/sec. and with cross-wind of side component up to 6 m/sec. does not cause excessive difficulties.'

1.5. Meteorological information

The pilots who were present at the aerodrome at the time of the accident stated that on the day of the accident Paluknys aerodrome was dominated by strong and gusty cross-wind (western).

Actual meteorological conditions are measured at Paluknys aerodrome but the meteorological station installed here does not have the meteorological data recording function. The following is written in the Flight Logbook of Paluknys aerodrome as of 27 June 2017:

'Direction of the wind 250°
Speed of the wind 5-7 m/s.'

The Vilnius meteorological station of the Lithuanian Hydrometeorology Service under the Ministry of Environment located in Trakai Vokė recorded the weather conditions (Table 2) and an amount precipitation on 24-27 June 2017 (Table 3). This station is located at a distance of around 22 km to north-east from the place of the accident.

Table 2. Meteorological information on 27 June 2017

Local time	Wind direction	Average wind speed, *m/s*	Maximum wind speed, *m/s*	Cloud cover, okta	Air temperature, *°C*	Pressure at the sea level, *mb*
9:00	west	4,5	8	1	14,6	1010,9
10:00	west	4,6	not measured	not measured	15,7	1011,3
11:00	west	4,8	not measured	not measured	16,0	1011,7
12:00	west	4,4	12	8	16,6	1012,0
13:00	west	4,7	not measured	not measured	17,4	1012,0
14:00	west	5,9	not measured	not measured	17,9	1012,1

Table 3. An amount precipitation on 24-27 June 2017

Day	24	25	26	27
An amount precipitation, *mm*	6,2	0,8	1,6	–

1.6. Communications

From 11 hrs. to 21 hrs. on 27 June 2017, the special gliding zone of Paluknys aerodrome was activated. Therefore, a flight coordinator was appointed. The records was received during the safety investigation.

1.7. Aerodrome information

Paluknys aerodrome held the Aerodrome Certificate issued by the Civil Aviation Administration on 12 June 2015 and valid until 9 June 2020.

The Flight instruction of the Paluknys aerodrome approved by Director of Vilnius Aero Club and in line with Director of the Civil Aviation Administration on 19 May 2017 indicates:

'2.1. The aerodrome is located at a distance of around 2.5 km southwards from Paluknys settlement.
<...>
2.4. The geographical coordinates of the aerodrome Reference Point (ARP) (WGS-84 system):
2.4.1. 54° 28' 59" north latitude;
2.4.2. 024° 59' 32" east longitude.
2.5. The altitude of the ARP above sea level, Haer = +466 feet (+142 m).
2.6. Magnetic deviation +7° (2015).
2.7. Magnetic headings (MH), dimensions and characteristics of the runways:
2.7.1. MH 179°-359°, length x width (in metre): 650 x 50; ground;
2.7.2. MH 037°-217°, length x width (in metre): 600 x 100; ground.
2.8. When carrying out glider flights, a runway against wind can be prepared in a different MH or in a different place, while using a suitable part of the aerodrome. In this case, the MH and other dimensions of the runway shall be established by the person in charge of flight safety.
<...>
7.2. The call sign of Paluknys aerodrome is 'PALUKNYS RADIJO'; the frequency of the radio communication used: 119,100 MHz.'

The western part of the aerodrome was ploughed and laid down with grass. The Director of Vilnius Aero Club stated that she wanted to convert the ever-unused part of the aerodrome into an area suitable for flights.

1.8. Wreckage and impact information

The aircraft taxied over from the aerodrome to the ploughed part of the aerodrome at an angle of 8° (Fig. 1). The aircraft taxied for 89 m until it stopped and turned over the front (Fig. 2 and 3). On the ploughed part of the aerodrome, wheel braking tracks were seen (Fig. 1).

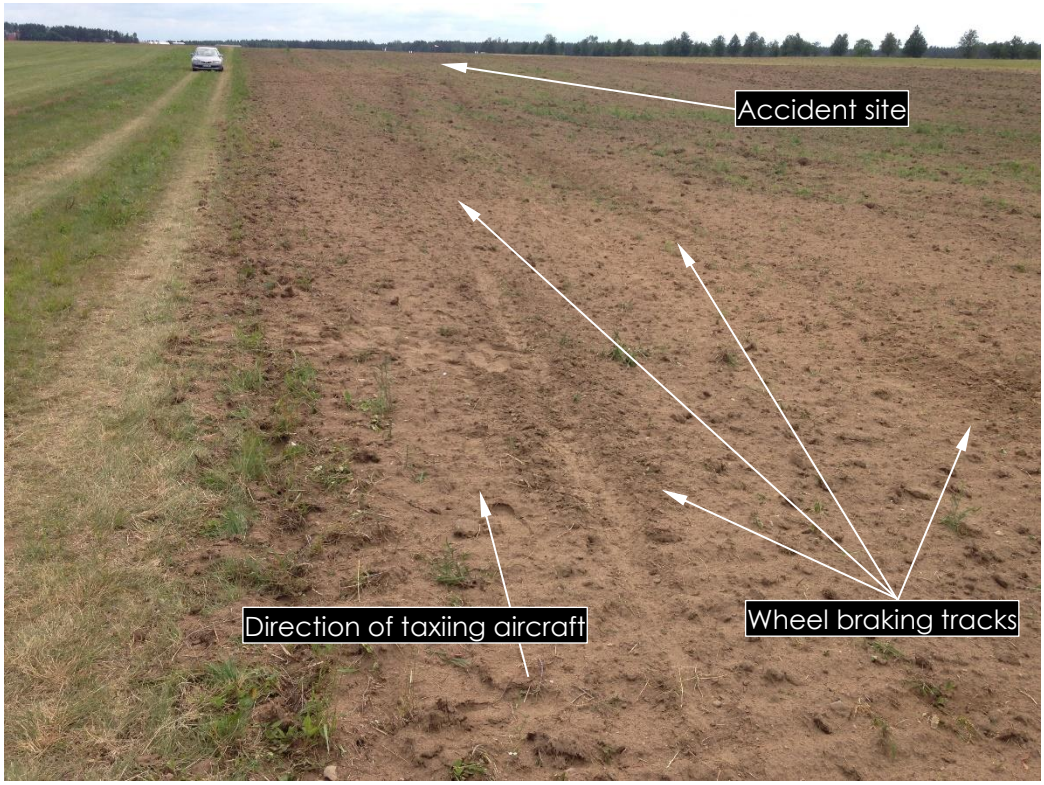

Fig. 1. Traces of aircraft PZL-104 Wilga-35A

Fig. 2. Aircraft PZL-104 Wilga-35A at turning over moment
(the image of eyewitness taken video)

Fig. 3. Aircraft PZL-104 Wilga-35A at accident site after turning-over

1.9. Additional information

1.9.1. Aircraft crew

The Aviation Law of the Republic of Lithuania indicates:

> *'Article 49. Aircraft crew*
> *1. The aircraft owner or operator must operate the aircraft with a flight crew in accordance with the requirements established by the manufacturer or the CAA for each type of aircraft.*
> *2. During the flight, the flight crewmembers of an aircraft must hold valid specialist licences and health certificates.'*

The Flight instruction of the Paluknys aerodrome approved by Director of Vilnius Aero Club and in line with Director of the Civil Aviation Administration on 19 May 2017 indicates:

> *'1.6. The organisation of flights is the responsibility of the responsible persons appointed by the managers of the aviation organisations carrying out flights at the aerodrome on the basis of the Paluknys Aerodrome Users' Interaction and Responsibility Instruction.'*

1.9.2. Permit to tow gliders

The Aircraft Crew Licensing Rules approved by Order No 4R-93 of the Director of the Civil Aviation Administration dated 20 April 2006 'Regarding the approval of the Aircraft Crew and Aircraft Maintenance Technicians/Engineers Licensing Rules' indicates:

> *'XXII. Issue of special permits*
> *405. Special permits are issued by the CAA to those applicants who have learned relevant theory and took practical training according to programmes approved by the CAA, paid the established governmental charge, and submitted the following;*
> *405.1. An application in accordance with the established form (CAA Lic – 009, 019);*
> *405.2. Documents certifying the programme taken;*
> *405.3. The flight logbook;*
> *405.4. The licence.*
> *406. The CAA shall issue the following special permits:*
> *<...>*
> *406.3. Glider towing (GT);*
> *<...>*
> *427. A pilot holding a Glider Towing (GT) permit may tow gliders from an aerodrome and site and to tow during en-route flights.'*

1.9.3. Organisation of the event

On 14 June 2017 Vilnius Aero Club submitted application to Civil Aviation Administration for permit to organise demonstrating event and aviation sport competition. The permit was provided on 15 June 2017.

The Rules of organising demonstrating events and aviation sport competitions approved by Order No. 30 of 31 July 2001 of the Director of Civil Aviation Administration "Approvement of the Rules of organising demonstrating events and aviation sport competitions" indicates:

> *'14. Director of the event must:*
> *14.1. check if all participants have required licences, aircrafts – airworthiness;*
> *<...>*
> *23. Director of the event every day before flights must held all participants briefing in which they should be introduced with:*
> *<...>*
> *23.3. forecasts and factual metrological conditions;'.*

1.9.4. Aerodrome

The Aviation Law of the Republic of Lithuania provides:

> *'Article 42. Usability of Civil Aerodromes*
> *<…>*
> *3. The responsibility for the compliance of the civil aerodrome with the established requirements shall be borne the individual or legal entity managing the aerodrome. The individual or legal entity managing the civil aerodrome shall immediately report to the CAA any circumstances, events or malfunctions which may affect the aerodrome and compliance with the established requirements.'*

The Rules for the Issue of Civil Aerodrome Certificates approved by Order No 4R-206 of the Director of the Civil Aviation Administration dated 11 November 2004 'Regarding the approval of the Rules for the Issue of Civil Aerodrome Certificates' indicates:

> *'3. The maintenance of aerodromes and their usability according to special requirements shall be the responsibility of the owner or the operator of the aerodrome. The owner or the operator must notify the Civil Aviation Administration (hereinafter referred to as 'the CAA') about planned work at the territory of the aerodrome (construction and repair of runways, taxiways, and apron, change of navigation systems and indicator light installations, improvement of radio communication, etc.) as well as about additional activities at the territory of the aerodrome where such activities affect the operation of the airport and safety of flights.'*

The Flight instruction of the Paluknys aerodrome approved by Director of Vilnius Aero Club and in line with Director of the Civil Aviation Administration on 19 May 2017 indicates:

> *'1.2. Vilnius Aero Club shall administer the aerodrome and be responsible for its maintenance and for maintaining its usability.'*

2. REMARKS AND COMMENTS

2.1. Taxing in case of crosswind

When an aircraft is airborne, it moves together with the air mass irrespective of the aircraft heading and speed. Meanwhile, when an aircraft is taxiing on the ground, the aircraft cannot move together with the air mass or crosswind due to friction forces acting its wheels. The aircraft with a tail landing gear (wheel) has a greater side area behind the main landing gear than forward of the gear. Therefore, the main gear acts as a pivot point and the greater part of the side area of the aircraft turned towards the crosswind determines that the aircraft is inclined to turn into the wind. In other words, the moments of side aerodynamic forces and the moments of wheel friction forces aggregate and force the aircraft to turn into the wind.

In case of crosswind, when taxiing, the pilot should immediately compensate the moment turning against wind using the rudder by pressing the turn pedal in the direction of wind. Then the taxiing direction should be kept by the rudder and then, as speed decreases, also by the brakes. The aircraft with a tail landing gear (wheel) may not be stopped suddenly because the aircraft may overturn. Also, when taxiing, any smallest intent of the aircraft to turn should be responded to by rudders and brakes because in case of a greater deviation from the taxiing direction, the turning trend increases and control of the aircraft may be lost.

The non-uniform firmness of the ground under the wheels may cause the aircraft to sway from side to side, which makes keeping the taxiing direction much more difficult. Soft ground deforms under the wheels and causes significantly greater friction forces. Although increased friction forces reduce the taxiing distance, they increase the load onto the landing gear elements. The aircraft with a tail landing gear (wheel) may overturn on soft ground.

2.2. Causes of the accident

When using the right traffic circuit of the runway (magnetic heading 179°) the gusty west wind, which had prevailed when the aircraft was descending and taxing, became crosswind, which exceeded the limitations specified in the Flight Manual.

The person who was piloting the aircraft did not assess the limitations of aircraft, impact of crosswind, due to lacked refreshed skills and due to inattention, he could not maintain the aircraft taxiing direction after the landing of the aircraft and taxied to the ploughed part of the aerodrome. When taxiing by the ploughed part of the aerodrome, the aircraft was halted and turned over the front at a slope.

2.3. Lessons learned

This accident serves that pilots should be familiar with the crosswind of the aircraft they fly and avoid operations in weather conditions that exceed the limitations of the aircraft, as well as their own capability. As soon as the aircraft touches the ground, the pilot of the aircraft must be especially attentive in order to keep the aircraft taxiing direction.

The organizer of demonstrating event and aviation sport competition shall take into account weather conditions and disallow the operation of those aircraft for which the weather conditions are beyond the limitations of the aircraft. Also the organizer and the owner or operator of the aircraft must ensure that the aircraft is not used either for flying or for towing gliders by any persons who are not authorised for the purpose. Compliance with these requirements should allow preventing similar accidents.

The owner or operator of the aerodrome shall inform the Civil Aviation Administration about any work planned at the territory of the aerodrome, which affects the operation of the aerodrome and safety of flights. The purpose of such information is to familiarise the aviation community with changed conditions at the aerodrome and to allow assessing them in advance.

MINISTRY OF JUSTICE OF THE REPUBLIC OF LITHUANIA
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Budgetary agency,
Gedimino ave. 30, LT-01104, Vilnius
Tel. +370 266 2989
E-Mail. taits@tm.lt
tm.lrv.lt/taits

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