FINAL REPORT

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In accordance with the provisions of SI 205 of 1997, the Chief Inspector of Air Accidents, on 4 May 2008, appointed Mr. Leo Murray as the Investigator-in-Charge to carry out an Investigation into this Accident and prepare a Synoptic Report.

Aircraft Type and Registration:	TECNAM Srl P2002-JF, EI-LFC
No. and Type of Engines:	1 x ROTAX 912-S2
Aircraft Serial Number:	63
Year of Manufacture:	2007
Date and Time (UTC):	4 May 2008 @ 15.50 hrs
Location:	Coonagh Airfield, Co. Limerick
Type of Flight:	Private
Persons on Board:	Crew – 1 Passengers – 1
Injuries:	None
Nature of Damage:	Substantial
Commander's Licence:	Private Pilot's Licence (Aeroplanes)
Commander's Details:	Male, aged 46 years
Commander's Flying Experience:	1,393 hours, of which 26 were on type
Notification Source:	Limerick Flying Club
Information Source:	AAIU Field investigation

SYNOPSIS

The aircraft was departing Coonagh Airfield on a local flight with two occupants, the Pilot and a passenger. The surface wind was estimated at 200 degrees at 10-14 kts, resulting in a crosswind condition. As the aircraft approached take-off speed it swung to the left and departed the paved surface of the runway. The Pilot applied full right rudder to correct but, as the aircraft came back on the paved surface, the left main landing gear detached damaging the tailplane as it travelled rearwards. The Pilot abandoned the take-off, the aircraft decelerated rapidly and came to rest in the grass on the left side of the runway. There were no injuries.

1. FACTUAL INFORMATION

1.1 History of the flight

The Pilot's intention was to conduct a local flight from Coonagh Airfield with a friend. The weather was good on the day, but with a strong crosswind from the left. External checks were completed and start up made at 15.45 hrs on the ramp. After a short taxi out and when power checks were completed the aircraft taxied to the departure end of the active runway (RWY) 28. On lining up the Pilot assessed the wind as being from 200 degrees at 10 kts from the airfield windsock. The take-off roll commenced at 15.50 hrs. As the indicated air speed reached 45-50 kts the aircraft veered to the left with the left main landing gear and nose gear departing the paved surface (**Photo No. 1**).

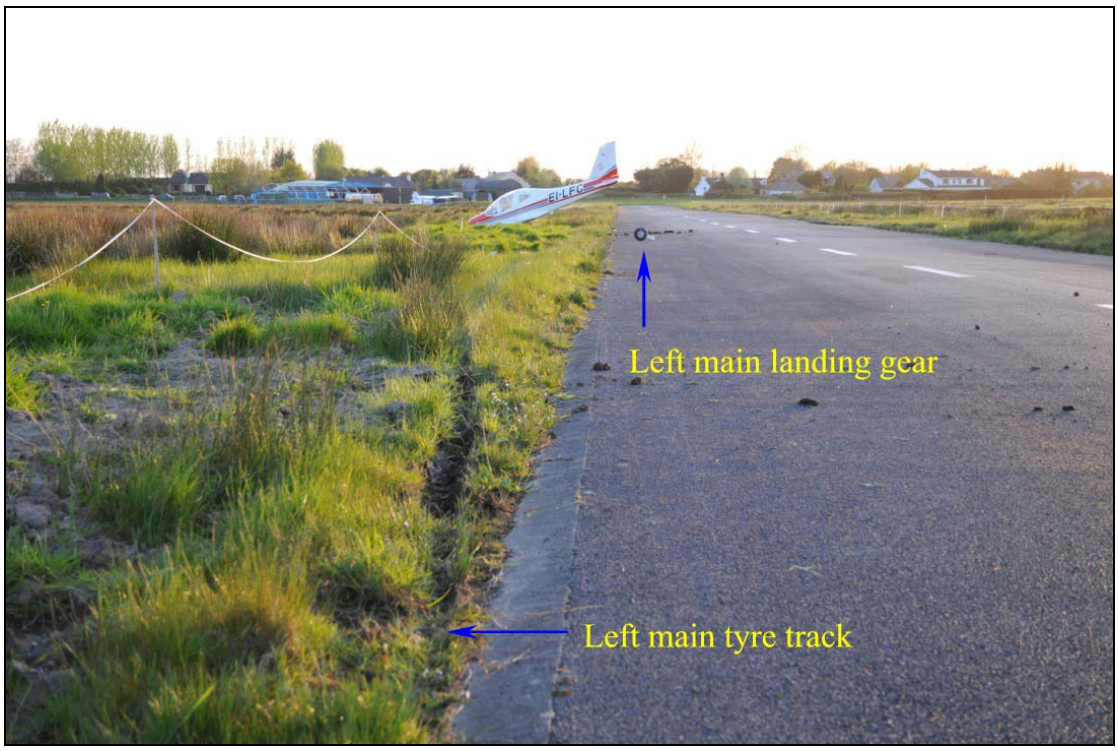

Photo No. 1: General view

Application of full right rudder brought the aircraft back towards the runway centreline but as flying speed was reached the Pilot heard a loud 'thud' as the left main landing gear leg detached and struck the horizontal tailplane (stabilator[1]). The Pilot rejected the take-off and closed the throttle, keeping the nose up by application of aft control stick.

As the aircraft decelerated it swung sharply to the left and impacted into boggy ground adjacent to the runway. The aircraft came to a stop and pitched nose down due to the nose wheel leg shearing on impact. The Pilot ensured that his passenger was uninjured and, on completing his shutdown checks, he opened the canopy and exited the aircraft with his passenger.

[1] **Stabilator**: An all-moving control surface instead of a separate elevator.

1.2 Technical Information

1.2.1 General

The TECNAM P2002-JF is a two seat, single engine aircraft with a tapered low wing, fixed main landing gear and steerable nose wheel. It is powered by a single Bombardier-ROTAX 912 S2 4-stroke, 4-cylinder, horizontally-opposed engine, developing 69 kW (92.5 HP) at 5,500 RPM (continuous rating). A Hoffmann two-bladed wooden fixed-pitch propeller is fitted as standard. The type was approved by the European Aviation Safety Agency (EASA) in accordance with CS-VLA of 14 November 2003. The type was issued with Certificate No. A.006 on 27 May 2004. Both pilot seats were equipped with four-point shoulder harnesses.

EI-LFC was delivered to the Limerick Flying Club in July 2007, and was the first example of its type to be acquired by the Club. At the time of the accident the airframe had accumulated a total of 157.5 hrs.

1.2.2 Brake System

The brake system comprises a single hydraulic system, which acts on both wheels of the main landing gear through disc brakes. The same circuit acts as a parking brake via an intercept valve. There is no differential braking available.

1.2.3 Crosswind limits

The P2002-JF Flight Manual (Section 5 Performances) gives the following guidance on crosswind operations: Under crosswind conditions the '*maximum demonstrated crosswind velocity is 22 kts'*. This limit applies for take-off and landing. The wind conditions on the day of the accident were well within these limits.

1.3 Airfield Information

Coonagh Airfield is situated 2 nm west of Limerick and is a licensed Private Airfield for operations under Visual Flight Rules (VFR). It has a single paved runway designated RWY 10-28. The runway is 416 metres in length by 9 metres wide. The easterly end has a displaced threshold and a turning circle to aid manoeuvring. RWY 28 was in use at the time of the accident. A single windsock is situated in the centre of the field, and is visible from both ends of the runway. Aeronautical Information Circular (AIC) Nr 02/08 provides information for intending operators. An additional note states that only '*experienced, fully licensed pilots with recent currency in short field techniques will be granted permission to use the airfield.* Also that *STOL* (short take-off and landing) *operations are the norm'*.

1.4 Meteorological Information

Before flight the Pilot obtained the Shannon ATIS, as Shannon is the nearest reporting station. The report revealed a moderate south-westerly wind from 200 degrees True (°T) at 14 kts, visibility in excess of 10 Km, with few cloud at 3,000 ft. Temperature was 17 ºC, Dew Point 7 ºC with a Pressure setting of 1017 hPa (hectorPascals). In his report to the Investigation, the Pilot indicated the actual wind to be 200 degrees at 10-14 kts, assessed by the airfield windsock.

1.5 Pilot Information

The Pilot was an experienced flight instructor with the Club. He held a Private Pilot's Licence (Aeroplanes) with a Flight Instructor's Rating and a Class II Medical Certificate valid until 31 December 2009. The Pilot was interviewed and stated he had completed two instructional details on the aircraft previous to the accident flight and reported no handling difficulties with the aircraft regarding the steering or brakes. Regarding the accident flight, on commencing the take-off roll there was a significant crosswind from the left, the aircraft accelerated normally and tracked straight initially as the nose was raised. As the aircraft accelerated it swung to the left, which was counteracted with full right rudder, but departed the paved surface.

1.6 Damage to aircraft

The aircraft incurred significant damage to the left wing as evidenced by buckling of the wing skin on the upper surface due to contact with the ground (**Photo No. 2**). The left wing flap mechanism was also damaged. The engine was displaced and the propeller broken. The left stabilator showed a significant impact on the leading edge as a result of being struck by the detached main landing gear leg (**Photo No. 3**). The rear fuselage showed evidence of a tail strike with the runway during the event.

Photo No. 2: Damage to left wing

Photo No. 3: Damage to left stabilator

1.7 Field Investigation

The AAIU were notified of the accident by the Operator and attended the scene the same day. The aircraft began its take-off roll on RWY 28 and, at a distance of 95 metres (m) from the threshold, the left main landing gear and nose wheel departed the paved surface to the left leaving two distinct tracks in the grass. The surface was observed to be quite rough with small mounds of earth close to the runway edge. At a distance of 131 m the wheel tracks rejoin the runway where the left main landing gear was found complete but without it's fairing, which remained in the grass where it detached. The aircraft stopped 17 m further along, and to the left of the runway, in a nose-down attitude with the nose leg sheared and lying underneath the aircraft.

2. ANALYSIS

The Instructor was an experienced pilot and was operating from his home airfield with which he was very familiar. Operations from the runway at Coonagh must be carefully planned as the runway is relatively short and quite narrow. As with any new type of aircraft in a club environment, experience must be gained by the instructors in all areas of the flying syllabus including crosswind operations. On the day of the accident the instructor had already flown two instructional details in EI-LFC. No handling difficulties were reported on this, or the accident flight.

Pilots operating from Coonagh normally copy the current Shannon ATIS for general conditions before flight. It should be borne in mind that the wind conditions at Shannon are not necessarily indicative of the actual conditions at Coonagh, a point which the Pilot made to the Investigation. Although the crosswind component was within the Manufacturer's limits the narrow runway at Coonagh leaves little margin for error. With a crosswind almost directly across the runway directional control of the aircraft becomes critical. Should the nose wheel be raised too early in the take-off run, the rudder alone may not have sufficient authority to maintain directional control in a strong crosswind. The aircraft nose was raised early in the take-off roll thereby leaving the rudder as the sole means of maintaining directional control. This technique is not desirable in crosswind conditions, especially for operations on narrow runways. Leaving the nose wheel in ground contact during acceleration provides the pilot with direct steering capability until adequate rudder effectiveness is achieved.

The uneven surface adjacent to the runway was the prime factor in overloading the landing gear leg, which detached when subjected to the additional side loading when it joined the paved surface. The flying club informed the Investigation that the uneven surface adjacent to the runway has since been levelled to a distance of 2 metres from the paved surface of the runway.

Since the accident the Flying Club has re-iterated the correct crosswind techniques to all members and have also imposed a 10 kt maximum crosswind limitation for the type.

3. CONCLUSIONS

(a) Findings

1. The nose wheel was raised early in the take-off run, leaving the rudder as the sole means of maintaining directional control.

2. In the crosswind conditions experienced, the rudder had insufficient authority to maintain directional control until adequate speed had been achieved.

3. Following departure of the paved surface, the uneven nature of the ground adjacent to the runway caused the failure of the left main landing gear attachment bolt.

(b) Probable cause

Raising the nose wheel early in the take-off run lead to a loss of directional control in the crosswind conditions experienced, with the result that the aircraft departed the runway.

(c) Contributory factors

The uneven nature of the ground adjacent to the runway caused the failure of the left main landing gear attachment bolt.

4. SAFETY RECOMMENDATION

This Investigation does not sustain any Safety Recommendations.

- END -