BAAI

BUREAU OF AIR ACCIDENT INVESTIGATION

This investigation has been conducted in accordance with *Annex 13 to the ICAO Convention on International Civil Aviation*, *EU Regulation No 996/2010* and *The Civil Aviation (Investigation of Air Accidents and Incidents) Regulation; Legal Notice 16 of 2013*.

Under these Regulations, the sole objective of the investigation of an accident or incident is the prevention of accidents and incidents in the future. It is not the purpose of this investigation to assign fault or blame and the reporting process should not be used to determine liability.

A safety investigation report for the runway excursion of the Tecnam P2002 JF, Reg No. 9H-PIC

1. General Information.

Location: Malta International Airport	**Accident Number:** BAAI/SIR-002-2020
Date & Time: 1st February 2020, approximately 8:00 am (Local)	**Registration:** 9H-PIC
Aircraft: Tecnam P2002 JF Sierra	**Aircraft Damage:** Significant: Damaged right wing-tip and buckled leading edge; Damaged propeller; Nosewheel collapse; Damaged engine and gearbox
Defining Event: Runway excursion following landing on RWY 23	**Injuries:** Slight injury reported

2. Synopsis

A Tecnam P2002 JF Sierra landed on the RWY 23 in good metrological conditions. The aircraft stalled during the flare maneuver resulting in a hard landing on the nosewheel. This caused the propeller and the right wing to hit the ground which caused considerable damage to the propeller, the wing tip assembly and the engine to seize. Following the impact, the aircraft veered left, and in an attempt to stop the aircraft from entering grass, heavy braking was exercised.

3. Factual Information

Aircraft and Owner/Operator Information

Aircraft Make: Tecnam

Model/Series: P2002JF Sierra

Aircraft Owner: European Pilot Academy

Registration: 9H-PIC

Aircraft Category: Single engine Airplane

Year of Manufacture: 2004

Landing Gear Type: Tricycle

Seats: 2

ELT: Not installed. A portable PLB was on board.

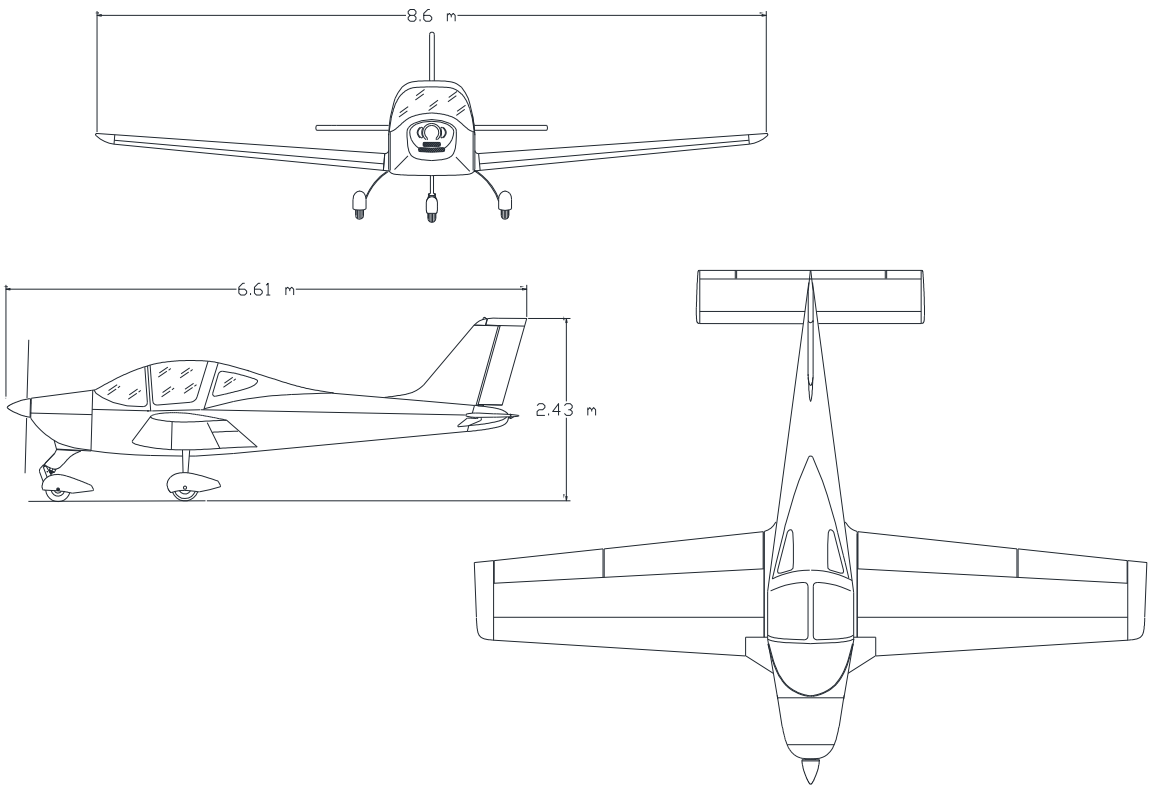

Fig. 1: Overview of the aircraft dimensions

Meteorological Information

Conditions at Accident Site: Visual conditions clear
Condition of Light: Day
Lowest Cloud Condition: N/A
Lowest Ceiling: N/A
Wind Speed/Gusts: Avg. wind speed 4 Kts
Forecast/Actual: Actual
Wind Direction: Average direction 280°
Forecast/Actual: Actual
Altimeter Setting: N/A
Temperature/Dew Point: N/A
Precipitation and Obscuration: None

Airport Information

Airport: Malta International Airport
Geographical coordinates: N 35°51'/E 014°28'
Airport Elevation: 297ft (Threshold Runway 05)
Runway Used: RWY 23
Runway Heading: 232°
Runway Surface Type: Asphalt
Runway conditions: Dry
Runway Length/Width: 2377m/45m

On-Site Evidence

The aircraft was found on the grass just off the edge of RWY23 and at an angle to the RWY. The RWY showed marks of the propeller hitting the ground and of the nosewheel collapse. The aircraft right wing had scratching signs and suffered from a slight buckling at the leading edge.

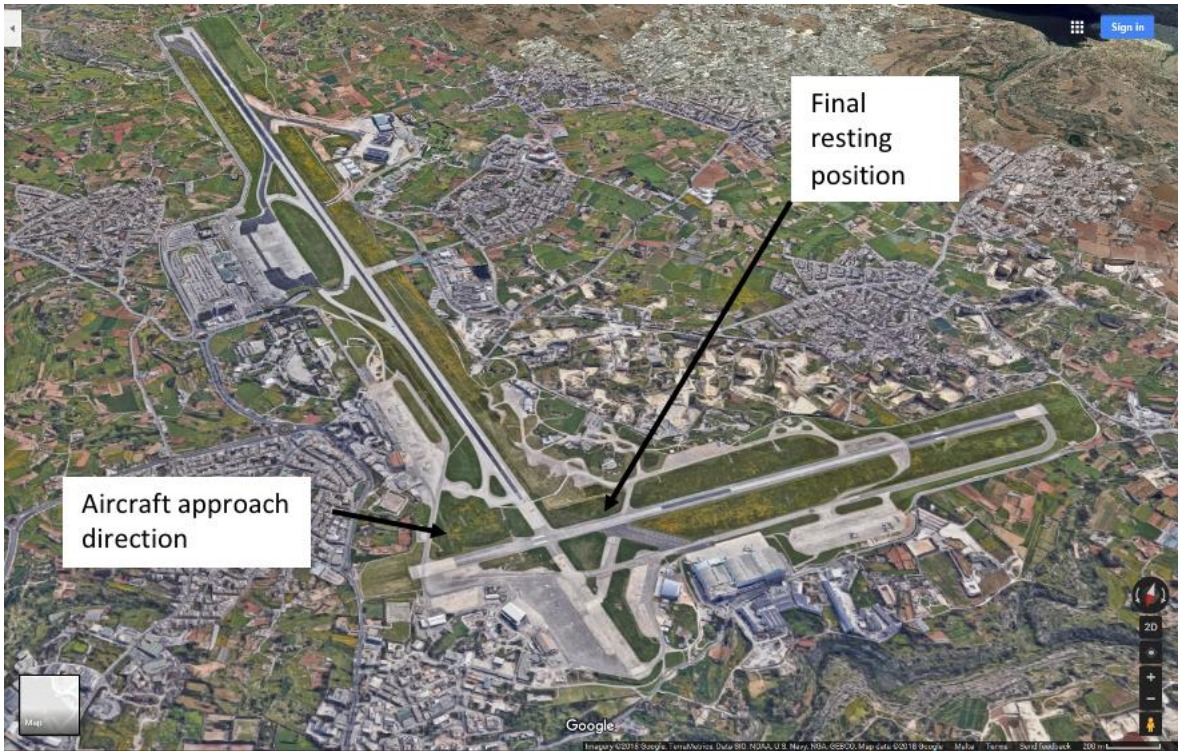

Fig. 2: Overview of the airport with aircraft approach direction and final resting position.

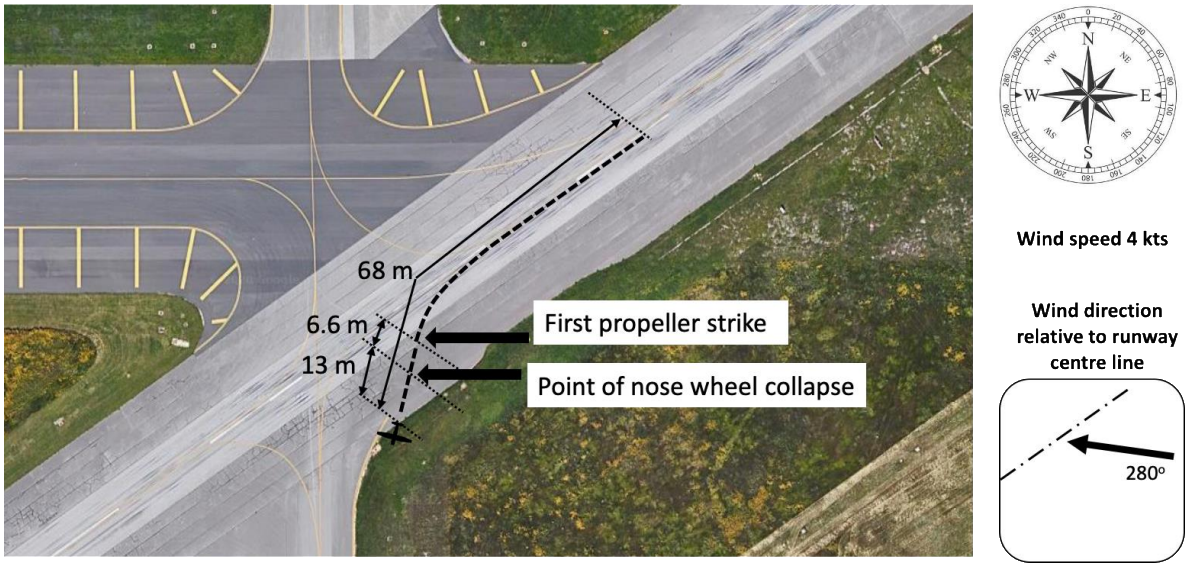

Fig. 3. Sketch of the final resting position of the aircraft.

Fig. 5. Scratch marks on the ground close to the aircraft's final resting position.

Fig. 5. The aircraft in its final resting position.

Fig. 5. Damage on the right wing-tip.

Fig. 6. Nose wheel collapse and damaged propeller.

4. Findings

This investigation considered three hypothesis which could have led to the accident.

1. **Wake turbulence from a larger aircraft on take-off from RWY 31/13 which could have un-stabilized the smaller aircraft.**

A weather report (METAR) issued at 8:15 am read:

METAR LMML 010815Z 28004KT 250V310 9999 FEW014 15/14 Q1023 NOSIG=

The wind speed is 4 Kts, wind direction 280°. Due to the low wind velocities, any vortices generated by the wake of larger aircraft could have remained lingering on the airfield and pushed onto RWY 23. However, the wind direction vis-à-vis the orientation of the runway would make this highly unlikely that such wake vortices would have affected the aircraft at the flare position.

2. **A nosewheel dive upon hard braking.**

The aircraft manual highlights the following:

> *"Propeller ground clearance 320 mm.*
> *Propeller ground clearance with deflated tire and nose wheel shock absorber compressed by 102 mm."*

Following the accident, it was confirmed that the correct components are used on the aircraft. Moreover, the aircraft did not suffer a deflated tyre, and therefore the only way to hit the propeller on the ground is if the aircraft was still airborne and suffered a sudden and violent nosedive. Therefore, the possibility of a propeller strike solely from hard braking is discarded.

3. **Improper landing technique which led to a stall.**

An aircraft stall is an aerodynamic condition in which the wing aerofoil exceeds its critical angle of attack (*for a given airspeed*), experiencing a reduction in the lift coefficient. As a result, the generated lift is reduced and unable to support the aircraft in flight. In fixed-wing aircraft, these are experienced as a sudden reduction in lift. Stalls commonly occur at slow airspeeds. For this reason, slow-speed flight, such as

during departure, approach and landing are critical phases of flight which require special attention. During training, pilots are advised to be particularly alert at these times to prevent stalling the aircraft.

In general, a pilot can initiate a stall recovery by increasing the airflow over the wing. This is usually accomplished by lowering the pitch attitude, levelling the wings, and increasing power. However, if the stall occurs during the flare phase of landing, the aircraft will not have enough height for the nose to be lowered and there may not be enough time for a power increase to have the desired effect. It is imperative to prevent the airspeed from bleeding off too quickly by extending the flare, especially when the power is reduced to idle.

The ground effect is defined as "*The positive influence on the lifting characteristics of the horizontal surfaces of an aircraft wing when it is close to the ground. This effect is a consequence of the distortion of the airflow below such surfaces attributable to the proximity of the ground*". Awareness of ground effect is important during the landing flare since it will heighten any tendency of an aircraft to float, resulting in loss of airspeed and consequently lift which may result in a slow-speed stall.

The Bureau of Air Accidents (Malta) has determined the probable cause of this accident is a slow-speed stall.

ABBREVIATIONS

ATC	-	Air Traffic Control
ATIS	-	Automatic Terminal Information Service
ICAO	-	International Civil Aviation Organization
LMML	-	Malta International Airport ICAO Code
MATS	-	Malta Air Traffic Services
MTOW	-	Maximum Take-off Weight
NOSIG	-	No Significant Weather
PPL(A)	-	Private Pilot License (Airplane)
QNH	-	Atmospheric Pressure adjusted to Mean Sea Level
SEP(Land)	-	Single Engine Piston (Land)
VFR	-	Visual Flight Rules
WGS84	-	World Geodetic System 1984