AIRCRAFT INCIDENT SHORT REPORT

CA18/3/2/1227: ZU-EMI, Blade flapping due to a gust of wind.

Date and time	: 11 November 2018 1300Z
Occurrence type	: Serious Incident
Aircraft registration	: ZU-EMI
Aircraft manufacturer and model	: ELA Aviacion, ELA-08
Last Point of departure	: Paradise Beach Airfield Jeffreys Bay Eastern Cape
Next point of intended landing	: Patensie Private Airstrip Eastern Cape
Location of incident site with reference to easily defined geographical points (GPS readings if possible)	: Paradise Beach Airfield : S34°06'10" E024°52'58" elevation 15 feet
Meteorological Information	: Surface wind: 180°/20 kt, temperature: 26°C, visibility: good
Type of operation	: Private (Part 94)
Persons on board	: 1 + 1
Injuries	: None
Damage to aircraft	: The main rotor, mast, propeller, tail section and rudder were damaged

All times given in this report is Co-ordinated Universal Time (UTC) and will be denoted by (Z). South African Standard Time is UTC plus 2 hours.

Purpose of the Investigation:

In terms of Regulation 12.03.1 of the Civil Aviation Regulations (2011) this report was compiled in the interests of the promotion of aviation safety and the reduction of the risk of aviation accidents or incidents and ***not to apportion blame or liability****.*

Disclaimer:

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1. SYNOPSIS

1.1 On 11 November 2018, the pilot-in-command (PIC) and a passenger prepared to fly from Paradise Beach airfield to a private airstrip in Patensie Eastern Cape area.

1.2 The pilot reported that prior to take-off he pre-rotated the main rotor blades to 200 revolutions per minute (RPM) and commenced with the take-off roll. After about 30 m down the runway length, a gust of wind caused a low-speed blade flap, which caused the control stick to shake violently. Before the pilot could correct the condition, the main rotor blades made contact with the propeller blades and the tail section.

1.3 The pilot then shut down the engine and vacated the runway. No injuries were reported by the pilot.

1.4 The investigation revealed that a gust of wind induced a low speed main rotor blade flap which caused the main rotor blades to contact the propeller blades and the tail section resulting in an aborted take-off.

2. FACTUAL INFORMATION

2.1 On 11 November 2018, the PIC and a passenger prepared to fly from Paradise Beach airfield to a private airstrip in Patensie Eastern Cape area. This was a private pleasure flight, which was conducted under the provisions of Part 94 of Civil Aviation Regulations (CARs) of 2011 as amended.

2.2 The pilot reported that prior to take-off he pre-rotated the main rotor blades to 200 revolutions per minute (rpm) and commenced with the take-off roll. After about 30 m down the runway length, a gust of wind caused a low-speed blade flap, which caused the control stick to shake violently. Before he could correct the condition, the main rotor blades made contact with the propeller blades and the tail section.

2.3 The pilot indicated that he then shut the engine down and vacated the runway.

2.4 The pilot reported that the temperature at the time of the incident was 26°C with the prevailing wind conditions at 180°/20 kt.

2.5 An official weather report was requested from the South African Weather Service. The reported weather for St Francis Bay at 1300Z on the day of the incident reported that the temperature was 21°C with the prevailing wind conditions at 110°/12 kt gusting 23 Kt. St Francis Bay is situated about 11 km south-west of the Paradise Beach airfield. The pilot reported that the accident occurred around 1300Z.

2.6 Based on the pilot report the wind condition was 180°/20 kt. For the reported wind condition the aircraft was operated at a calculated crosswind component of 19.70 kt and a tailwind component of 3.47 kt.

2.7 The pilot acknowledged that he used the ELA 07-07S pilot's operating handbook (POH) to operate the aircraft. According to the POH, the aircraft is allowed to operate in winds of up to 40 kt gusting. The maximum allowable crosswind is 16 kt for take-off and landing. The maximum allowable tailwind is 5 kt for take-off and landing. The manufacturer confirmed that when the main rotor blades strike the propeller and tail section during take-off roll, it is likely a problem of low rotor RPM and high wind.

2.8 The incident occurred during daylight conditions at a geographical position determined to be S34°06'10" E024°52'58", at an elevation of 15 ft.

3. FINDINGS

3.1 The pilot had been issued with a national pilot's licence (NPL) on 22 October 2018, which was due to expire on 15 October 2020.

3.2 The pilot was in possession of a valid aviation medical certificate that had been issued on 6 January 2016 by a designated aviation medical examiner, which was due to expire on 31 January 2021.

3.3 The pilot had accumulated a total of 117 flying hours, all of which were on the gyrocopter type. He had flown 4.8 hours on type during the 90 days prior to the incident.

3.4 The aircraft had been issued with a Certificate of Release to service on 21 March 2018, which was due to expire on 20 March 2019 or at 181.6 hours. A subsequent Authority to Fly certificate had been issued on 6 April 2018, with an expiry date of 20 March 2019.

3.5 The maximum crosswind component as stipulated by the POH is 16 kt, and the actual crosswind at the time of the accident was calculated to be 19.7 kt; therefore the aircraft was being operated in crosswind conditions exceeding the limitations provided in the POH.

3.6 The aircraft sustained damage to the main rotor, propeller, tail section and rudder.

3.7 The incident ELA-08 gyrocopter was being operated using the ELA 07-07S (V07-05) POH because the ELA-08 model had been discontinued by the manufacturer. The manufacturer was approached to confirm whether it is acceptable to use the alternative POH; the response from the operator was positive. The ELA 07-07S (V07-05) is the latest update of the POH for ELA-08 aircraft.

4. PROBABLE CAUSE

4.1 A gust of wind induced a low speed main rotor blade flap which caused the main rotor blades to contact the propeller blades and the tail section resulting in an aborted take-off.

5. CONTRIBUTING FACTOR

5.1 None.

6. REFERENCES

6.1 ELA 07-07S POH version V07-05.

6.2 https://www.e6bx.com

Figure 1: Google Earth map of runway 08 at Paradise Beach airfield, indicating wind direction on the incident day

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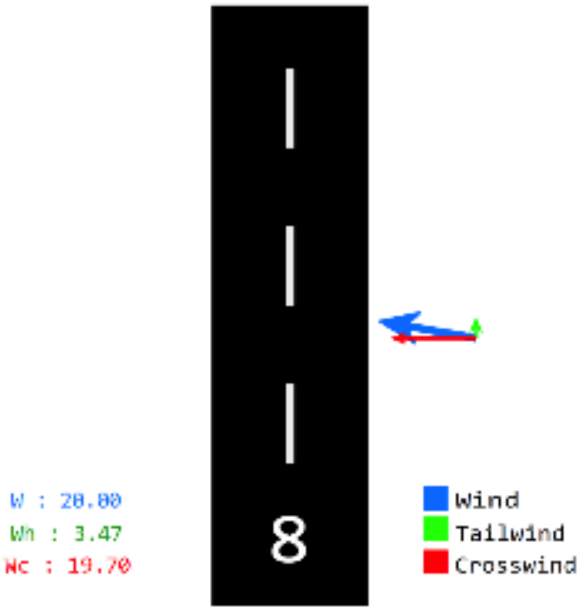

Figure 2: Schematic depicting the crosswind and tailwind components on the incident day
(Source: https://www.e6bx.com)

3.8 LIMITATIONS TABLES

DATA	LIMITATION
Take-off weight (MTOW) 912 ULS engine *Take-off weight (MTOW) 914 UL engine	450 kg (990 lb) 500 kg (1100 lb)
Pilot weight (front)	60 – 100 kg 130 – 220 lb
Load factor	+3.5g
Bank angle	60º
Ambient temperature	-20 – 40ºC -4 – 105ºF
Turbulence speed (Vb)	105 kph 65 mph 57 kts
Wind or gust	40 kts
Cross wind take-off and landing	16 kts
Tail wind landing	5 kts

Figure 3: Copy of the ELA gyrocopter limitations table
(Source: ELA 07-07S POH version V07-05)

Figure 4: Damage to the propeller
(Source: aircraft owner)

Figure 5: Damage to the rudder and tail section
(Source: aircraft owner)

7. SAFETY RECOMMENDATION

7.1 None.

8. ORGANISATION

8.1 None.

9. SAFETY MESSAGE

9.1 None.

This Report is issued by:

Accident and Incident Investigation Division
South African Civil Aviation Authority
Republic of South Africa