



AIRCRAFT ACCIDENT REPORT
OCCURRENCE NUMBER 01/1047
AIRBORNE WINDSPORTS EDGE 582
ZK-JCU
NEAR HAVELOCK NORTH
1 APRIL 2001

Glossary of abbreviations used in this report:

agl	above ground level
CAA	Civil Aviation Authority
CAR	Civil Aviation Rule(s)
E	east
ft	foot or feet
km	kilometre(s)
m	metre(s)
nm	nautical mile(s)
NZST	New Zealand Standard Time
S	south

AIRCRAFT ACCIDENT REPORT

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Aircraft type, serial number and registration:	Airborne Windsports Pty Ltd Edge 582, MAANZ/491, ZK-JCU
Number and type of engines:	One Rotax 582
Year of manufacture:	1993
Date and time:	1 April 2001, 1630 hours* (approx)
Location:	3 km north-east of Havelock North Latitude: S 39° 39.6' Longitude: E 176° 54.8'
Type of flight:	Private
Persons on board:	Crew: 1 Passengers: 1
Injuries:	Crew: 1 fatal Passengers: 1 fatal
Nature of damage:	Aircraft destroyed
Pilot-in-command's licence	Private Pilot Licence (Aeroplane)
Pilot-in-command's age	32 years
Pilot-in-command's total flying experience:	186 hours (47 microlight) 47 on type
Information sources:	Civil Aviation Authority field investigation
Investigator in Charge:	Mr J A Daley

* Times are NZST (UTC + 12 hours)

Synopsis

The Civil Aviation Authority was notified of the accident at 1635 hours on Sunday 1 April 2001. The Transport Accident Investigation Commission was in turn notified shortly thereafter, but declined to investigate. A CAA site investigation was commenced the next day.

The pilot had been operating from a paddock near Havelock North giving flights to a number of people. During the final flight the microlight entered a spiral dive in which the left wing failed and the aircraft dived to the ground. The aeroplane was destroyed and both occupants were killed.

1. Factual information

1.1 History of the flight

- 1.1.1 On the morning of Sunday 1 April 2001 the owner-pilot of ZK- JCU was conducting a number of hang-glider aerotows from a paddock on Te Mata Mangateretere Road, near Havelock North.
- 1.1.2 During the afternoon the pilot was providing flights to a number of people including those involved with the earlier hang-gliding activities. This group included a number of hang-glider pilots, who witnessed these flights.
- 1.1.3 The pilot's typical sortie was a take-off, climb to a suitable altitude, steeply-banked spiral dive and recovery, then fly at low level over the group of people in the paddock.
- 1.1.4 Some of the local residents were concerned by the pilot's activities, especially during low-level manoeuvres. The aircraft was seen to be just above the pine trees near the paddock where the flights were being conducted. One resident asked her husband to bring the children in from outside as she believed the aircraft was flying too close to her house.
- 1.1.5 Another who was familiar with microlight activities was concerned when she saw the aircraft below the level of the tree line. She commented to her husband that "he (the pilot) appeared to be a bit of a daredevil".
- 1.1.6 Two hang-gliding friends of the passenger (who was also a hang-glider pilot) heard banter between himself and the pilot regarding making the flight "a rush".
- 1.1.7 The aircraft climbed to approximately 900 ft agl and then commenced a left-hand spiral dive. During the spiral dive, at a height of approximately 200 ft agl, the left wing failed. The aircraft then dived, out of control, and struck the ground heavily.
- 1.1.8 Elements of the pilot's flight activities, as well as the in flight structural failure and impact, were recorded on video by the passenger's fiancée.
- 1.1.9 Witnesses rushed to the aircraft to render first aid to the occupants but the pilot and passenger died at the accident scene.

- 1.1.10 The accident occurred in daylight, at approximately 1635 hours NZST, at Havelock North, at an elevation of approximately 50 feet. Grid reference 260-V21-456646, latitude S 39° 39.6', longitude E 176° 54.8'.

1.2 Injuries to persons

<i>Injuries</i>	<i>Crew</i>	<i>Passengers</i>	<i>Other</i>
Fatal	1	1	0
Serious	0	0	0
Minor/None	0	0	

1.3 Damage to aircraft

- 1.3.1 The aircraft was destroyed.

1.4 Other damage

- 1.4.1 Nil.

1.5 Personnel information

- 1.5.1 The pilot, aged 32, held a Private Pilot Licence (Aeroplane), first issued in May 1993. The Class 2 medical certificate applicable to the licence had expired on 7 June 1998.
- 1.5.2 The pilot had commenced microlight flying on 16 October 1999. It is clear from his logbook entries that he had been carrying passengers from 14 November 1999; at which time he had accrued a total of 6.1 hours microlight experience.
- 1.5.3 The pilot had registered as a client of Sport Aviation Corporation Ltd (SAC) and was issued a membership certificate on 5 February 2000. His SAC Microlight Flight Crew Certificate was not valid because a SAC instructor had not checked the pilot's flight proficiency in weight-shift control aircraft. His classification was Intermediate (which permits the pilot to fly within 10 nm of his take-off point), Group B (which is valid for the operation of three-axis control microlights only) but was not permitted to carry passengers. The pilot had not renewed his annual SAC subscription at the time of the accident. The renewal was due on 5 February 2001.
- 1.5.4 The pilot held a current Microlight Medical Certificate which expired on 17 November 2003.
- 1.5.5 The pilot had completed hang-glider aerotow training with a microlight instructor on 11 February 2001.

1.6 Aircraft information

- 1.6.1 Airborne Windsports Pty Ltd Edge 582, ZK-JCU was a Class 2 microlight aeroplane manufactured by Airborne Windsports Pty Ltd Australia. It was a high-wing monoplane, weight-shift controlled “trike” with tandem two-place seating, and was powered by a 53 horsepower Rotax 582 engine driving a fixed-pitch propeller.
- 1.6.2 The aircraft was imported new into New Zealand and was issued with a Civil Aviation Authority Flight Permit on 27 August 1993, as aircraft serial number MAANZ/491. The pilot took ownership of the aircraft on 18 October 1999.
- 1.6.3 The pilot of ZK-JCU was involved in a landing accident when he collided with a fence at Kokiri (near Greymouth) on 13 January 2000. The aircraft received extensive damage to the wing, undercarriage and propeller.
- 1.6.4 From January to November 2000 the aircraft was rebuilt by the pilot, an associate and a senior student from the school where the pilot was employed as a teacher. The rebuild was utilised as a school project by the student and his project folder contained detailed photographs of the accident and the various stages of the rebuild.
- 1.6.5 The aircraft required a replacement wing, the pilot purchased a wing from a local hang-glider manufacturer. This company sold him a copy of an Italian-manufactured Polaris OK 350 microlight aircraft wing. The pilot fitted this replacement wing to his aircraft during the rebuild.
- 1.6.6 ZK-JCU was inspected by a SAC microlight aircraft representative on 12 November 2000 for the aircraft’s annual Flight Permit validation. However, the pilot did not disclose to the inspecting officer that the aircraft had been damaged and rebuilt. The aircraft was subsequently flown on a regular basis from this date until the day of the accident.
- 1.6.7 During the pilot’s aerotow training on 11 February 2001, the instructor was concerned by the rigging and flight characteristics of the aircraft. The instructor discovered that the pilot had modified the “hang point” on the wing well forward (approximately 100 mm) of the factory setting, enabling the aircraft to fly faster than the wing design cruise speeds. The instructor refused to fly the aircraft again until the “hang point” was returned to the recommended position. The pilot kept a handwritten maintenance log and it records that on 1 December 2000 he had moved the hang point forward. However, there was no record of his having restored it to the original position.

1.7 Meteorological information

- 1.7.1 There was a ridge of high pressure over central New Zealand with a dominant high cell east of the North Island. Weather conditions on the day were good with visibility greater than 40 km and a little cloud at 4000 to 5000 ft. Moderate east to north-east winds were forecast for the afternoon.

1.7.2 These conditions were confirmed by the video recording, and weather was not a factor in the accident.

1.8 Aids to navigation

1.8.1 Not applicable.

1.9 Communications

1.9.1 Not applicable.

1.10 Aerodrome information

1.10.1 Not applicable.

1.11 Flight recorders

1.11.1 Not applicable.

1.12 Wreckage and impact information

1.12.1 The aircraft impacted almost vertically in a paddock adjacent to Te Mata Mangateretere Road, near Havelock North. It then bounced coming to rest approximately 19 m north-west of the initial impact point.

1.12.2 The entire structure was accounted for at the accident site. The main wreckage was contained in one area and exhibited severe structural deformation consistent with a high-speed impact.

1.12.3 The left leading-edge tube of the wing was found to have fractured at the cross-tube/leading-edge junction.

1.12.4 There was no useful information from the engine controls because of the damage to the aircraft and the displacement of the engine at impact.

1.13 Medical and pathological information

1.13.1 Post-mortem examination found that the pilot had died of multiple injuries sustained at the time of impact. No evidence was found of any pre-existing condition, which may have led to in-flight incapacitation.

1.13.2 Toxicological tests on the pilot revealed no trace of alcohol, or medical or recreational drugs.

1.14 Fire

1.14.1 Fire did not occur.

1.15 Survival aspects

1.15.1 Although the pilot and passenger were restrained by lap and shoulder harnesses and wore helmets, the impact forces were unsurvivable.

1.15.2 The cockpit design and construction meant that there was little protection afforded to the occupants in the event of an accident. Any significant impact in this type of aircraft usually results in the destruction of the cockpit area with consequential effects on the occupants.

1.16 Tests and research

1.16.1 Following on-site examination the wing assembly was taken to an aircraft engineering facility for further examination.

1.16.2 The manufacturers of the new aircraft wing assisted with the reconstruction of all the major components of the wing.

1.16.3 The left wing leading-edge tube was subjected to scientific metallurgical examination. It was determined that the left leading edge tube failed in overload at the main attachment point to the cross-tube. This was the result of a massive longitudinal load being applied to the attachment bolt and leading edge tube.

1.16.4 The “hang point” on the keel tube was also found to be in the pilot-modified forward position.

1.17 Organisational and management information

1.17.1 Not applicable.

1.18 Additional information

1.18.1 Civil Aviation Rules, Part 12 *Accidents, Incidents, and Statistics*, detail requirements for the notification and reporting of accidents:

12.51 Notification of accident

(a) Each pilot in command of an aircraft that is involved in an accident or, if that person is fatally or seriously injured, or if the aircraft is missing, the operator, shall notify the Authority of the accident as soon as practicable.

12.53 Details of accident

(a) The pilot in command of an aircraft that is involved in an accident or if that person is fatally or seriously injured, the operator, shall provide the occurrence details requested on form CA 005 to the Authority within 10 days of the accident.

1.18.2 Civil Aviation Rules, Part 103 *Microlight Aircraft – Certification and Operating Rules*, stipulate the minimum requirements for the operation of microlight aircraft, and these include:

103.5 Pilot requirements

(a) Each person acting as the pilot of a microlight shall-

(1) Hold an appropriate current microlight pilot certificate with an appropriate type rating

103.159 Carriage of passengers

A pilot shall not carry another person in a microlight aircraft unless –

(1) The pilot has been authorised by a microlight organisation to do so.

103.209 Modification

Where a Class 2 microlight is modified in any manner that may affect the airworthiness of the aircraft, the operator shall ensure that the aircraft is reinspected and reassessed for compliance with 103.207 (issue of Flight Permit) before further flight.

- 1.18.3 The SAC Microlight Aircraft Inspection and Flight Permit Validation Application Form # E.3.8 states:

B. OWNER'S STATEMENT

I certify that since the last condition inspection I have not carried out any repairs or alterations to this Aircraft that would affect the airworthiness or invalidate the Aircraft Type Certification Standard. I have also complied with all mandatory Service Bulletins and Safety Directives issued for the aircraft, engine, propeller/rotor and radio (if fitted), and I have entered these in the appropriate logbook, which is available for inspection.

- 1.18.4 The Airborne Windsports Pty Ltd Edge Pilot Handbook states:

1.5 Approved Wing/ Trike Combinations

*The Edge aircraft is **only** to be operated using the Airborne Edge Wing and the Airborne Edge Trike unit.*

Only this combination of wing and trike meets the requirements of the accepted Design Standards to which this aircraft complies.

1.19 Useful or effective investigation techniques

- 1.19.1 Nil.

2. Analysis

- 2.1 The pilot was not qualified to act as pilot in command of a microlight aircraft either solo or with passengers. This was because he had not completed the appropriate flight checks with a microlight instructor.
- 2.3 The pilot was not a current member of his microlight organisation. His subscription had expired on 5 February 2000.
- 2.4 The Flight Permit was no longer in force, as the aircraft had been extensively modified. The pilot did not disclose this in the owner's statement during the annual aircraft inspection. This inspection was completed on 12 November 2000,

after the accident rebuild. The pilot had signed the aircraft inspection statement declaring that he had not carried out any repairs or alterations to the aircraft.

- 2.5 The pilot did not report his accident of 13 January 2000 to the Civil Aviation Authority.
- 2.6 The pilot had extensively modified the aircraft (primarily by fitting of a new non-standard wing) without complying with the processes required by CAR Part 103. He had also moved the “hang point” forward in an effort to obtain more speed from his aircraft; this would also increase the forces applied to the wing. The “new” wing was designed for a slow-speed, high-lift environment. The original wing manufacturer stipulates in the pilot’s handbook that only their wing should be fitted to the Edge 582 in order to meet design standards.
- 2.8 The aircraft was watched by witnesses (and the flight recorded on video) performing manoeuvres that subjected it to high aerodynamic loads. These manoeuvres included steeply-banked spiral dives with subsequent high-load recoveries, high-speed, low-level passes (“beat-ups”) and wingovers. The aerodynamic loads resulted in the catastrophic failure of the left wing.
- 2.9 This accident was the result of consistent rule breaches. The pilot failed to comply with the requirements of his microlight flight crew certificate, flew passengers without the appropriate qualifications, had failed to report an accident, completed unapproved modifications to an aircraft, and made false declarations regarding its airworthiness. His flying on the day of the accident demonstrated a disregard for safety with dangerous low-level “beat ups” and manoeuvres requiring aerodynamic loads beyond the structural limits of his aircraft.
- 2.10 No specific safety recommendations were made as a result of this investigation.

3. Conclusions

- 3.1 The pilot held a valid microlight pilot medical certificate.
- 3.2 The pilot was not qualified for the flight in that he did not have a current pilot certificate or authority to carry passengers.
- 3.3 The aircraft had been extensively modified without complying with the Civil Aviation Rule process.
- 3.4 The aircraft did not have a valid Flight Permit.
- 3.5 The aircraft had been operating normally before the accident.
- 3.6 The pilot's manoeuvring subjected the aircraft to high aerodynamic loads.
- 3.7 These loads resulted in the initial failure of the left outer wing and subsequent total failure of the remaining wing structure.
- 3.8 The ensuing ground impact was not survivable.

(Signed)

J Alan Daley
Safety Investigator
9 September 2002

(Signed)

Richard White
Manager Safety Investigation