CIVIL AVIATION AUTHORITY
OF NEW ZEALAND

AIRCRAFT ACCIDENT REPORT

SOLO WINGS WINDLASS AQUILLA

ZK-MDM

LOSS OF CONTROL

TAURANGA AERODROME

27 SEPTEMBER 2010

Photo representative of aircraft type

CAA Occurrence No. 10/3704

Foreword

As a signatory to the Convention on International Civil Aviation 1944 ('the Chicago Convention') New Zealand has international obligations in respect of the investigation of accidents and incidents. Pursuant to Articles 26 and 37 of the Chicago Convention, the International Civil Aviation Organisation ('ICAO') issued Annex 13 to the Convention setting out International Standards and Recommended Practices in respect of the investigation of aircraft accidents and incidents.

New Zealand's international obligations are reflected in the Civil Aviation Act 1990 ('the Act') and the Transport Accident Investigation Commission Act 1990 ('the TAIC Act').

Section 72B(2)(d) and (e) of the Civil Aviation Act 1990 Act also provides:

> **72B Functions of Authority**
>
> (2) The Authority has the following functions:
>
> (d) To investigate and review civil aviation accidents and incidents in its capacity as the responsible safety and security authority, subject to the limitations set out in section 14(3) of the Transport Accident Investigation Commission Act 1990:
>
> (e) To notify the Transport Accident Investigation Commission in accordance with section 27 of this Act of accidents and incidents notified to the Authority.

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Glossary of Abbreviations:

amsl	above mean sea level
ATIS	Automatic Terminal Information Service
CAA	Civil Aviation Authority
E	east
ft	foot or feet
GP	General Practitioner
m	metre(s)
NZDT	New Zealand Daylight Time
RAANZ	Recreational Aircraft Association of New Zealand
S	south
VHF	very high frequency

CIVIL AVIATION AUTHORITY OF NEW ZEALAND

Data summary

Aircraft type, serial number and registration:	Solo Wings Windlass Aquilla, s/n WA1120, ZK-MDM
Number and type of engines:	One Bombardier-Rotax Gmbh 582
Year of manufacture:	December 2005
Date and time of accident:	27 September 2010, 0837 hours[1]
Location:	Tauranga Aerodrome Latitude[2]: S 37° 40' 21.65" Longitude: E 176° 12' 04.87"
Type of flight:	Private
Persons on board:	Crew: 1
Injuries:	Crew: 1 Fatal
Nature of damage:	Aircraft destroyed
Pilot-in-command's licence:	RAANZ Certificate - Novice - Weight-shift
Pilot-in-command's age:	56 years
Pilot-in-command's total flying experience:	43.8 hours, 40.5 on type
Information sources:	Civil Aviation Authority Field Investigation
Investigator in Charge:	Mr P Stevenson-Wright

[1] All times in this report are NZDT (UTC + 13 hours)

[2] WGS-84 co-ordinates

Synopsis

The pilot was conducting circuit training at Tauranga Aerodrome and was seen taking off and climbing at a relatively steep angle when the aircraft appeared to stop climbing and enter a steep left hand descending turn onto an almost reciprocal heading. It then seemed to recover from the descent into another climb before it again turned into another steep left hand descending turn from which the aircraft did not recover before striking the ground. First persons on the scene found the pilot deceased.

The Civil Aviation Authority (CAA) was notified of the accident at 0850 hours on 27 September 2010. The Transport Accident Investigation Commission was in turn notified shortly thereafter, but declined to investigate. A CAA Field Investigation was commenced later the same day.

1. Factual information

1.1 History of the flight

1.1.1 The pilot had been authorised by his instructor to carry out solo circuit training on the morning of the accident.

1.1.2 The pilot initially completed nine circuits off Grass Runway 22 because Grass Runway 25 was not available due to maintenance work in progress. When Grass Runway 25 became available the pilot asked the Tower Controller if he could re-circuit for that runway. This runway was preferable due to the prevailing wind conditions.

1.1.3 The aircraft was climbing out after its second touch and go landing on Grass Runway 25 when the accident occurred.

1.1.4 The accident occurred in daylight, at approximately 0837 hours, at Tauranga Aerodrome, at an elevation of 13 feet amsl. Latitude S 37° 40' 21.65". Longitude E 176° 12' 04.87".

1.2 Injuries to persons

Injuries	*Crew*	*Passengers*	*Other*
Fatal	1	0	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 Not applicable.

1.5 Personnel information

1.5.1 The pilot held a RAANZ Certificate Novice Weight-shift and a current Medical Certificate valid until 24 September 2011 and had recorded 43.8 hours flight time in total, including 8.2 hours in the last 90 days. Seven of those hours were solo circuit training flights in ZK-MDM.

1.5.2 The pilot's instructor stated that he had no major concerns about the pilots flying abilities or the weather conditions on the day of the accident. He had however restricted the pilot to circuit training as he felt the pilot needed to consolidate with more circuit time.

1.5.3 The pilot had flown solo in stronger winds of approximately 10 knots on previous occasions and had not experienced any difficulties.

1.6 Aircraft information

1.6.1 ZK-MDM was a Solo Wings Windlass Aquilla weight shift 2-seat microlight, serial number WA1120.

1.6.2 The aircraft was manufactured in December 2005 and issued with a CAA Non-Terminating Flight Permit that same month.

1.6.3 It was powered by a Bombardier-Rotax Gmbh 582 two stroke engine which drove a Warp Drive 72" three bladed composite propeller.

1.6.4 The aircraft's last Annual Condition Inspection was completed on 24 November 2009. There were no known defects recorded.

1.7 Meteorological information

1.7.1 At the time of the accident the Tauranga Aerodrome ATIS was reporting the wind direction from 260 degrees magnetic and the wind speed 7 knots.

1.7.2 Weather was not a factor in this accident.

1.8 Aids to navigation

1.8.1 Not applicable.

1.9 Communications

1.9.1 The aircraft was fitted with a VHF Radio and the pilot was in two way communications with the Tauranga Tower Controller.

1.9.2 All radio calls were transmitted, received and read back to the Tower Controller correctly.

1.9.3 There was no distress or emergency radio call made.

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 struck the ground at the southern edge of Grass Runway 25 in a left turn with a steep nose down attitude on a heading of approximately 220 degrees magnetic.

1.12.2 Impact forces were such the cockpit and nose section of the aircraft were significantly disrupted. Inspection of the right main wing spar revealed it had failed as a result of impact forces.

1.12.3 All three propeller blades sustained damage during the impact sequence indicating that the engine was operating at the time of the accident.

1.12.4 The aircraft fuel tank was found to be intact and contained approximately 20 litres of fuel.

1.12.5 The on-site inspection of the airframe, engine and propeller indicated that there were no pre-impact failures of those systems.

1.13 Medical and pathological information

1.13.1 The post mortem examination revealed that the pilot died of multiple injuries consistent with those of a high energy impact.

1.13.2 The report also noted evidence of abnormality of one of the pilot's heart valves, 'mild thickening of mitral valve with some hooding of the free edge of the leaflets'. It concluded that this could produce sudden death by arrhythmia.

1.13.3 A 20mm thickness of the wall of the left ventricle of the heart was also noted. A cardiologist review of the post mortem findings noted that that thickness 'suggests significant left ventricular hypertrophy' which can also be associated with increased likelihood of cardiac arrhythmia.

1.13.4 It was reported that the pilot had recently ceased taking the prescribed medication (Efexor) for long-term depression. His General Practitioner (GP) had previously stated to the pilot on 9 April 2010 that he should not fly until his medical condition had improved, as it could impair his concentration.

1.13.5 The post mortem blood toxicology tests however found traces of venaflexine, a component of Efexor, at a level consistent with recent therapeutic use.

1.14 Fire

1.14.1 Fire did not occur.

1.15 Survival aspects

1.15.1 The pilot was wearing his lap belt seat harness and a protective helmet however, the injuries sustained were not survivable.

1.16 Tests and research

1.16.1 The engine was inspected at a maintenance facility under CAA supervision. No defects were found that would have prevented the engine from operating normally.

1.17 Organisational and management information

1.17.1 Nil.

1.18 Additional information

1.18.1 Several people including four pilots witnessed the accident.

1.18.2 All witnesses described seeing the aircraft climbing at a steep angle. They observed the aircraft to stop climbing and enter a steep left hand descending turn on to a reciprocal heading. The aircraft recovered briefly from the decent before entering a further climb. The aircraft subsequently entered another steep left descending turn from which it did not recover before striking the ground.

1.18.3 The pilot was described by his instructor as one who would not attempt any manoeuvres he had not been taught.

1.18.4 The safety investigation sought expert opinion from the New Zealand Sales and Maintenance Agent of the aircraft. The Agent advised that the aircraft's stability is such that it would recover from a wings-level dive of its own accord. He also stated that a pilot would only need to apply a small control input to recover from the flight condition described above.

1.19 Useful or effective investigation techniques

1.19.1 A series of demonstration flights were conducted from Grass Runway 25 in late February 2011 using the same type of aircraft as ZK-MDM to illustrate to the witnesses what a normal climb and steep climb profiles would look like.

1.19.2 Four of the key witnesses were asked to view the flights from where they originally witnessed the accident.

1.19.3 Based on these flights the witnesses thought that ZK-MDM climbed to approximately 200ft and that the maximum demonstrated climb angle was closest to the angle they observed on the day of the accident.

2. Analysis

2.1 The accident scenario does not suggest any form of aircraft failure. In-flight medical incapacitation, however, cannot be excluded and the information available suggests that the pilot most likely suffered some form of in-flight medical incapacitation and was unable to return the aircraft to controlled flight.

2.2 Toxicology blood tests found therapeutic levels of anti-depressant medication in the pilot's blood so medical opinion is that it was likely that he was still taking his medication.

2.3 The pilot had flown 10 uneventful circuits immediately prior to the accident. Medication related side effects have the potential to contribute to impaired judgment or loss of control, although this was not thought to be likely in this case.

2.4 The safety investigation and medical information available indicates that the pilot most likely suffered an in-flight medical incapacitation and was not able to return the aircraft to controlled flight.

3. Conclusions

3.1 The pilot was appropriately licensed and authorised to conduct the flight.

3.2 The aircraft had a non-terminating Flight Permit and its Annual Inspection period was valid.

3.3 There was no evidence that the pilot's concentration or performance was impaired during the circuits flown prior to the accident.

3.4 The nature of the final flight manoeuvres suggests that an in-flight medical incapacitation is the most likely cause of the accident.

4. Safety actions

4.1 There are no safety actions applicable in respect to this accident.

Report written by:

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