



REPUBLIC OF KENYA

MINISTRY OF TRANSPORT AND INFRASTRUCTURE

AIR ACCIDENT INVESTIGATION

ACCIDENT REPORT

PIPER PA 28-235 REGISTRATION 5Y-BGG

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SUMMARY OF ACCIDENT

OPERATOR:	PRIVATE
AIRCRAFT TYPE:	PIPER PA28-235
MANUFACTURER:	PIPER AIRCRAFT COMPANY
YEAR OF MANUFACTURE:	1966
AIRCRAFT REGISTRATION:	5Y- BGG
AIRCRAFT SERIAL NUMBER:	10800
DATE OF REGISTRATION:	4 OCTOBER 1989
TYPE OF ENGINE:	LYCOMING O-540-B4B5
DATE OF ACCIDENT:	29th March 2010
TIME OF ACCIDENT:	0130Z
LOCATION OF ACCIDENT:	MUTUINI, DAGORETI
TYPE OF FLIGHT:	Private
NUMBER OF PERSONS ON BOARD:	1
INJURIES:	1 FATAL
NATURE OF DAMAGE:	DESTROYED.
PILOT EXPERIENCE:	OVER 3,000HRS

All times given in this report are Coordinated Universal Time (UTC). East African Local Time is UTC plus 3 hours.

SYNOPSIS

The AAID received notification of an aircraft accident that had occurred at Dagoretti, Nairobi on the 29th of March 2010 from the Kenya Civil Aviation ATC at 0145Z. The investigators were dispatched to the site of the accident the same day to carry out the investigations.

The aircraft, a Piper PA25-235 registration number 5Y-BGG, belonging to Laikipia Air Ltd departed from Nanyuki airstrip at 1130hrs and was estimated to arrive at Wilson airport at 1330hrs. The planned routing through the Rift Valley would provide for a 2 hr flight instead of the normal routing time. The pilot flew into terrain during bad weather while heading to Wilson airport. The pilot who was the sole occupant suffered fatal injuries from the accident. The aircraft was completely destroyed from the crash.

Investigations carried out by the AAID which included the crash site visit, eye witness interviews, and the Operator maintenance records, concluded that the aircraft flew into terrain during a bad weather.

The investigations which were carried out in accordance with accident investigation regulations and the provisions of the ICAO annex 13, was not intended to apportion blame or liability purposes but with the sole objective of prevention of accidents and incidents.

The Cabinet Secretary, Ministry of Transport and Infrastructure, in accordance with regulation 18 of *The Civil Aviation (Aircraft Accident and Incident Investigation) Regulations, 2009* authorizes the release of this report.

30 June 2014

ABREVIATION

AGL :	Above Ground Level
AMSL :	Above Mean Sea Level
C of A :	Certificate of Airworthiness
C of R :	Certificate of Registration
IAS:	indicated airspeed
ISA :	International Standard Atmosphere
Kt:	knot(s)
lbs :	Pounds
ltr:	litre(s)
m:	metres
mb:	millibar(s)
Nm:	nautical mile(s)
Psi:	pounds per square inch
QNH :	Pressure setting to indicate height above aerodrome
Rpm:	revolutions per minute
TAS :	True Airspeed
TBO :	Time Between Overhaul
VFR :	Visual Flight Rules
VMC :	Visual Meteorological Conditions

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1 FACTUAL INFORMATION

1.1 History of the flight

The aircraft had departed from Nanyuki airstrip (HKNY) at 1130Z destined for Wilson airport (HKNW) Nairobi. The weather reported at both Nanyuki and Wilson was good for the planned VFR flight. The pilot had initially obtained the Wilson weather information by calling Aeroclub of East Africa who has installed an internet enabled weather webcam. The pilot purposed to perform 'engine bedding in', a process normally done by an aircraft engineer after an engine overhaul inspection. The pilot opted to do the engine 'bedding in' on the same repositioning flight to Wilson airport Nairobi where the aircraft was scheduled to be re-weighed.

The pilot routed his flight through Baringo area before heading to Wilson airport. This routing would provide for sufficient time of 2Hrs to carry out the engine 'bedding in' process. The pilot, upon entry into the Wilson control zone boundary, transmitted to the control tower his estimated time of arrival as 0153Z. As the aircraft was approaching Wilson airport from the Rift Valley region the weather had drastically changed and there developed low clouds with heavy downpour along the flight path at Mutuini, Dagoretti. Inbound flights are expected to maintain an altitude of less than 9,000' ASL within the Wilson ATS control zone boundary. While approaching from the North-west of Wilson heading towards the 'Monastery', a reporting waypoint before positioning the aircraft for the final approach path to runway 07, the aircraft are required procedurally to decrease altitude towards 6,500' ASL. There was no further communication from either the pilot or the control tower thereafter. The aircraft then crashed at 0130Z. The impact to the ground surface occurred at a time of heavy downpour with thunder storms and poor visibility in the Dagoretti area resulting in the complete disintegration of the aircraft.

The pilot suffered fatal injuries from the high inertia impact aircraft crash.

1.1.1 Location of the Accident

The accident occurred at Mutuini in Dagoretti area.

1.2 Injuries to persons

Injuries	Crew	Passengers	Total in aircraft
Fatal	0	0	0
Serious	1	0	1
Minor	0	0	0
None	0	0	0
TOTAL	1	0	1

1.3 Damage to aircraft

The aircraft was completely destroyed from the high impact forces.

1.4 Other damage

Oil and fuel spillage was noticeable. There was debris of the wreckage scattered in the homestead. The iron sheet roofing of the wooden structure building was also damaged by the wreckage and debris impact.

1.5 Personnel information

1.5.1 Pilot

The pilot was a 61 year old male who was licensed to fly the type of aircraft. He held a private pilot's license which was valid till 21 February 2011. He was examined medically by a KCAA approved medical examiner for the class 2 medical certificate on 29 January 2010. The pilot had over 3,000hrs total time for group 'A' aircraft rating.

1.6 Aircraft information

The Piper PA28-235 aircraft Registration 5Y-BGG, serial number 28-10800 was manufactured by Piper Aircraft Company in the year 1966 and was equipped with a Lycoming O-540 reciprocating engine.

It was registered in Kenya on 4th October 1989 under the private category. It was previously registered under a different registration number (5Y-BDO) after deregistration by the FAA in 1967. The aircraft had a valid Certificate of Airworthiness re-issued on 26th July 2006 by the Kenya Civil Aviation Authority and which was to expire on 25th July 2007.

1.7 Meteorological information

The meteorological information was readily available to the pilot through the Nanyuki military ATC however, there is no evidence that this information was obtained from them by the pilot. It was noted that the pilot made a call to Aeroclub of East Africa before his departure and enquired the prevailing weather at Wilson Airport, the planned destination for the flight. At the time of the accident, 0130 UTC, the observed weather at Wilson was developing into light showers with cumulonimbus clouds building up from the west direction of the airport.

Meteorological office weather report for the Dagoretti area **30 min before** the time of the occurrence indicated a 50 degrees wind direction of 8knots strength, a visibility of more than 10Km, a small build up of Cumulonimbus clouds broken at 2,500 feet above ground level, with a temperature of 25 degrees Celsius, dew point temperature of 15 degrees and at pressure QNH 1019.

The Meteorological office weather report for the same area **30 min after** the time of the occurrence indicated a 220 degrees wind direction of 22knots strength, a visibility of better than 10Km, with thunder storms (up and down drafts), a few Cumulonimbus clouds at 2,200 feet above ground level and broken at 8,000 feet above ground level, with a temperature of 19 degrees Celsius, dew point temperature of 14 degrees and at pressure QNH 1020.

1.8 Aids to navigation

The aircraft was on a visual flight rules flight (VFR) and was well equipped with all the necessary Navigation instruments for the flight. The Navigation aids were not considered a factor in this accident.

1.9 Communications

The aircraft was equipped with the standard Radio Communications equipment. In his communication with the Wilson airport ATCO the pilot had informed the tower that the aircraft destination arrival time was estimated at 0153 UTC. The transmission occurred upon the aircraft entry into the Wilson ATS Zone boundary. There was no further communication from the pilot.

1.10 Aerodrome information

Nairobi Wilson

ICAO code: HKNW
Longitude: 36° 49' 0" E
Latitude: 1° 19' 0" S
Surface: Asphalt

Runway 07/25 4173ft X 72ft (1272m X 22m)

	Runway 07	Runway 25
Latitude:	1.324847	1.3203
Longitude:	36.806325	36.818667

Runway 14/32 4405ft X 76ft (1343m X 23m)

	Runway 14	Runway 32
Latitude:	1.318883	1.32855
Longitude:	36.811914	36.821875

1.11 Flight recorders

The aircraft was not equipped with a flight data recorder (FDR) or a cockpit voice recorder (CVR); neither was it required by regulation.

1.12 Wreckage and impact information



As shown in the wreckage photo above, the aircraft was completely destroyed on impact to the ground before the wreckage and debris scattered, much of which were restrained by the wooden house structure. There were some debris on the iron sheet roof of the house while some were found scattered within the compound within a radius distance of 40m from the point of impact with the ground.

1.13 Medical and pathological information

The pilot was fatally injured from the crash due to the hard impact forces with the ground surface.

1.14 Fire

There was no evidence of fire before the aircraft had impact to the ground surface. An examination of the wreckage at the site and further examination of the wreckage at the storage revealed no indication of a post impact fire.

1.15 Survival aspects

The impact force to the ground surface was much greater than 5g and thereby causing aircraft structure to disintegrate. The accident was not survivable due to the magnitude of deceleration forces.

1.16 Tests and research

The aircraft engine was recovered from the wreckage and sent to an approved (by KCAA) engine overhaul facility. An engine strip inspection was carried out and a report was given to the investigation team. It was established that the engine had a shock-loading due to the abrupt stoppage on the impact with the ground. There was no evidence of defects noted during the strip examination which could have occurred prior to the aircraft crash.

1.17 Organizational and management information

The aircraft was owned by Laikipia air Ltd., a company based in Nanyuki. The aircraft was maintained at Tropic air maintenance ltd., a company approved by the KCAA, and also based at Nanyuki airstrip. Prior to the flight the aircraft had a major maintenance work involving the installation of a newly overhauled engine.

1.18 Additional information

The pilot was an experienced consulting aviation engineer with membership in several professional organizations including the Royal Aeronautical Society, Cessna Pilots Association etc.

1.19 Useful or effective investigation techniques

There was no useful investigation techniques employed for this accident.

2 ANALYSIS

Engine;

The engine 'bedding in' process is a standard manufacturer requirement after an engine overhaul has been carried out and is a practice commonly performed when the engine is already installed on the aircraft (in situ), or on a specially prepared engine test bed. The process involves testing the engine in a well regulated process which includes engine performance data collection at different engine parameters (RPM ranges with regulated fuel flow). The piston rings, crankshaft bearings etc are set for eventual optimum

performance of the engine. Also monitored in this process is the lubricating oil consumption rate, temperature and pressure. The entire test process takes 1 to 2hrs depending on the engine type manufacturer specification requirements.

It is unlikely that an engine specialist would carry out the 'bedding in' task successfully in accordance with the manufacturer's instructions and requirements under circumstances that vary adversely. The Outside air temperature (OAT), fuel pressure, pressure altitude, cylinder head temperatures (CHT), wind direction, external loads on the engine etc requires to be monitored and recorded as they all affect the outcome of the test.

The engine was overhauled by a KCAA approved overhaul facility and was released for installation to the aircraft where the engine run-in was intended to be performed. A note on the approved certificate indicated that the 'run-in figures, oil consumption, compression readings and oil filter inspection results' were to be forwarded to the overhaul facility.

It is however noted that there was no evidence of the engine malfunction or system defect prior to the impact.

3 CONCLUSIONS

3.1 Findings

Aircraft

- The maintenance records indicated that the aircraft was certified, equipped and maintained in accordance with existing regulations and approved procedures
- There was no evidence of airframe failure or system malfunction prior to the accident
- The aircraft was structurally intact prior to impact with the ground
- All primary control surfaces were accounted for, and all damage to the aircraft was attributable to the severe impact forces
- The engine was overhauled in accordance with existing regulations and requirements
- The propeller blade damage and twist was consistent with the engine producing power at impact

Flight operations

- The pilot was licensed and qualified for the flight under visual flight rules (VFR) in accordance with existing regulations
- The pilot attempted to continue visual flight in instrument meteorological conditions (IMC).

4 PROBABLE CAUSE

The accident was likely caused by loss of control by the pilot due to severe weather conditions and at low altitude above ground level.

4.1 Contributing factors


The pilot did not have a weather update enroute to the destination as a result of extended flight time

Due to the severe weather conditions encountered enroute to Wilson, the pilot had very poor visibility.

5 SAFETY RECOMMENDATIONS

Kenya Civil Aviation Authority to formulate a policy and provide guidelines to the industry on reciprocating engine test runs after an overhaul inspection work before the engine is released to service.

APPENDIX A – Certificate of Registration

Serial No. **946**  KCAA (L) 25

KENYA CIVIL AVIATION AUTHORITY

Certificate of Registration of Aircraft


1354-A
No

1. Nationality and Registration Mark 5Y-BGG	2. Manufacturer and Manufacturer's Designation of Aircraft Piper Aircraft Corporation Piper PA28-235	3. Aircraft Serial Number 28-10800
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4. Name of Owner **Lakipia Air Limited**

5. Address of Owner **P. O. Box 1148-10400
Manyuki
KENYA**

6. It is hereby certified that the above described aircraft has been duly entered on the Kenya Aircraft register in accordance with the Convention on International Civil Aviation dated 7th December, 1944 and with the Kenya Civil Aviation Act, and the Air Navigation Regulations issued thereunder applicable in Kenya.

Date of issue **27th October, 2009** 
by authority of the Director General.

NOTE:
1. This Certificate is not proof of the Aircraft Ownership.
2. No entries or endorsements may be made in this certificate except in the manner and by the person authorised for that purpose.

[P.T.O.]

APPENDIX B – site and wreckage photos

Photo showing point of impact with the ground



Wreckage position

Impact spot

Photo showing wreckage from the left side of the wooden house.



wreckage