

THE REPUBLIC OF KENYA



**MINISTRY OF TRANSPORT, INFRASTRUCTURE, HOUSING,
URBAN DEVELOPMENT & PUBLIC WORKS**

STATE DEPARTMENT FOR TRANSPORT

AIRCRAFT ACCIDENT INVESTIGATION DEPARTMENT

PRELIMINARY INVESTIGATION REPORT

**ACCIDENT TO THE AIRCRAFT 5Y-PSM, BELL 407GXP ON
30.05.2021 AT KUDHO PRIMARY SCHOOL, SIAYA COUNTY**

PRELIMINARY ACCIDENT REPORT SUMMARY

OPERATOR	:	Penial Air Ltd
AIRCRAFT TYPE	:	Bell 407 GXP
AIRCRAFT MANUFACTURER	:	Bell Helicopter Textron Canada Inc. (A Textron Aviation Inc. company)
YEAR OF MANUFACTURE	:	November 2008
AIRCRAFT REGISTRATION	:	5Y-PSM
AIRCRAFT SERIAL NUMBER	:	53896
DATE OF REGISTRATION	:	12 January 2011
NUMBER AND TYPE OF ENGINE	:	Rolls-Royce 250-C47B
DATE OF OCCURRENCE	:	30 May 2021
LOCATION OF OCCURRENCE	:	Kudho Primary School, Siaya County (0° 00' 33"N, 034° 26' 32"E)
POINT OF INTENDED LANDING	:	Yala Airstrip
TIME OF OCCURRENCE	:	1304 (1604)
TYPE OF FLIGHT	:	Commercial Air Transport (Passengers)
PHASE OF FLIGHT	:	Take Off
NUMBER OF PERSONS ON BOARD	:	Two
INJURIES	:	Nil
NATURE OF DAMAGE	:	Substantial
CLASS OF OCCURRENCE	:	Accident
PILOT IN COMMAND	:	CPL (H)
PIC's FLYING EXPERIENCE	:	1,675 Hours

All time given in this report is Coordinated Universal Time (UTC), with East African Local Time in Parenthesis

OBJECTIVE

This preliminary report contains factual information that has been determined up to the time of publication. The information in this report is published to inform the aviation industry and the public of the general circumstances of the accident.

This preliminary investigation has been carried out in accordance with The Kenya Civil Aviation (Aircraft Accident and Accident Investigation) Regulations, 2018, and Annex 13 to the ICAO Convention on International Civil Aviation.

The sole objective of the investigation of an Accident or Serious Incident under these Regulations shall be the prevention of Accidents and Serious Incidents. It shall not be the purpose of such an investigation to apportion blame or liability.

The information contained in this report is derived from the data collected during the preliminary investigation of the accident.

INVESTIGATION PROCESS

The occurrence involving a Bell 407GXP helicopter registration 5Y-PSM was notified to the Aircraft Accident Investigation Department (AAID), State Department for Transport (SDT) of the Ministry of Transport, Infrastructure, Housing, Urban development, and Public Works through a phone call by Wilson airport Control Tower.

Under the provisions of Annex 13 to the Convention on International Civil Aviation, Kenya civil aviation act, and regulations, an investigation into the circumstances leading to the Accident was initiated immediately.

After the initial on-site investigation phase, the occurrence was classified as an ‘Accident’ owing to the damage of the helicopter.

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LIST OF ABBREVIATIONS/GLOSSARY OF TERMS

AAID	-	Aircraft Accident Investigation Department
AGL	-	Above Ground Level
AMSL	-	Above Mean Sea Level
ATPL	-	Airline Transport Pilot License
CPL (H)	-	Commercial Pilot License (Helicopter category)
CRS	-	Certificate of Release to Service
CVR	-	Cockpit Voice Recorder
ELT	-	Emergency Locator Transmitter
FAA	-	Federal Aviation Administration
FDR	-	Flight Data Recorder
FM	-	Flight Manual
ft	-	feet
HKKI	-	Kisumu International Airport
ICAO	-	International Civil Aviation Organization
IFR	-	Instrument Flight Rules
IR	-	Instrument Rating
KAA	-	Kenya Airports Authority
KCAA	-	Kenya Civil Aviation Authority
KMD	-	Kenya Meteorological Department
LT	-	Local Time
MTOW	-	Maximum Takeoff Weight
nm	-	Nautical mile(s)
S/N	-	Serial Number
SDT	-	State Department for Transport
TSB	-	Transportation Safety Board of Canada
VFR	-	Visual Flight Rules
LH	-	Left Hand
LT	-	Local Time
RH	-	Right Hand
TBN	-	To Be Notified

SYNOPSIS

The report describes the events of a helicopter accident that took place on 30 May 2021 involving a Bell 407 registration 5Y-PSM owned by Hollen International Limited and operated by Penial Air Limited. The helicopter departed Kisumu International Airport for a Visual Flight Rules (VFR) flight to Wagai in Siaya County via Kudho Primary School with four occupants.

The aircraft landed safely at Kudho Primary School, six miles east of Wagai Shopping center to drop off the four occupants, but took off shortly thereafter with one passenger at 1304 (1604) to reposition to Yala airstrip where the four passengers were to board after completing official events with His Excellency the President of the Republic of Kenya.

During the takeoff roll, the helicopter rolled over and collided with terrain in an attempt to clear off nearby trees. The pilot and the passenger were extricated from the wreckage with minor injuries. There was no pre or post-impact fire and the helicopter sustained substantial damage.

1.0 FACTUAL INFORMATION

1.1 History of the Flight

On 30 May 2021, about 1304 (1604), a single-engine, turbine-powered Bell 407 helicopter, 5Y-PSM, operated by Penial Air Limited, rolled over and collided with terrain at Kudho Primary School, Siaya County. The certificated commercial pilot and the passenger suffered minor injuries and the helicopter sustained substantial damage.

On the morning of the accident, the pilot repositioned from Spectre International Company's Plant in Kisumu where the helicopter had been parked for an overnight stay, to the private residence of the former Prime Minister of the Republic of Kenya in Riat to pick him and his entourage.

According to the pilot, they left Riat at 1030 (1330) with four persons on board and 501lbs of fuel and landed at Kisumu International airport at 1034 (1334). This flight was uneventful. The plan was to receive the president of the Republic of Kenya and then proceed to Wagai in Siaya County for an official function preceding the country's Madaraka day celebrations in Kisumu.

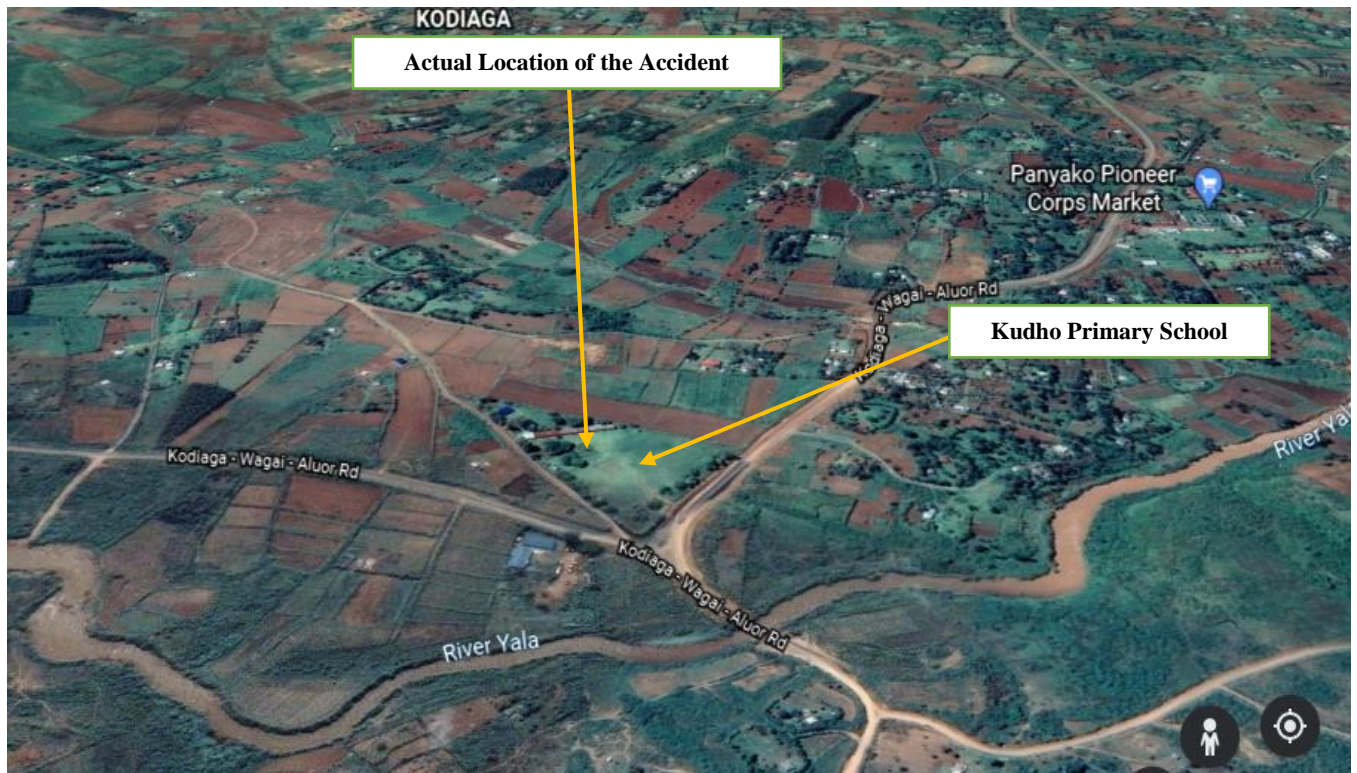
At 1226 (1526) the helicopter took off from Kisumu International Airport with four occupants onboard, arriving at Kudho Primary School at 1239 (1539). The pilot reported that he hover-taxied and parked at the convenient southeast end of the school ground to give space and way to the other two military presidential helicopters that were also scheduled to land at the same school ground. After the four occupants disembarked, the pilot shut down the engine. This flight was uneventful.

During takeoff at 1304 (1604) with one passenger on board, with intentions of repositioning to Yala airstrip where the four passengers were to board after completing the official events with the President. The helicopter rolled over and collided with terrain in an attempt to hover taxi to the left to clear off the nearby trees (fig 2). The pilot and the passenger were extricated from the wreckage with minor injuries.

There was no fire. The helicopter was substantially damaged.

The accident occurred during the hours of daylight and located at the geographical coordinates of 0° 00' 33"N, 034° 26' 32"E at an elevation of 4025 ft.

Figure 1: Area showing the location of the accident



Source: Background image Google Earth, annotated by AAID.

Figure 2: The Helicopter wreckage in the field at Kudho Primary School



1.2 Injuries to Persons

Table 1: Injury chart

Injuries	Crew	Passenger	Others
Fatal	0	0	0
Serious	0	0	0
Minor/None	1	1	

1.3 Damage to Aircraft

The aircraft was substantially damaged by impact forces.

Figure 3: The Helicopter wreckage in the field at Kudho Primary School



Figure 4: The Helicopter control panel after the accident



1.4 Other Damage

There was no other damage.

1.5 Pilot's Information

The pilot was certified and qualified under Kenya Civil Aviation Regulations.

Table 2: Summary of the pilot's relevant information

D.o.B/Age	26 December 1983, 38
Sex	Male
Nationality	Kenyan
Type of License	ATPL (H)
Issuing Authority	KCAA
Date of issue	9 March 2019
Validity of License	12 March 2022
Ratings	AS350, BK117, Bell206, Bell407
Total Flying hours	1,675.5
Total hours on type	112.8
Total last 90 days (hours)	100
Total last 30 days (hours)	7.6
Total last 7 days (hours)	7.6
Total last 24 Hours (hours)	1.9
Medical Certificate (Class/Validity)	Class 1, Examined on 12 March 2021

1.6 Aircraft Information

1.6.1 General information

The aircraft was certificated and maintained in accordance with Kenya Civil Air Regulations.

1.6.2 5Y-PSM

Figure 5: 5Y- PSM aircraft before the accident



Table 3: Aircraft data at the time of the Accident

Aircraft data at the time of the Accident	
Manufacturer:	Bell Helicopter Textron Canada Inc. (A Textron Aviation Inc. Company)
Model:	Bell 407GXP
MSN:	53896
Identification Plate Number	CC-003366
Year of manufacture:	2008
Total hours since new	4518
Nationality and registration mark:	Kenyan, 5Y-PSM
Certificate of airworthiness	
Number:	S/No. 0236
Initial Issue date:	17 October 2018
Renewal date	17 October 2020
Valid until:	16 October 2021

Certificate of registration	
Number:	S/No. 2212-A
Issue date:	12 January 2011
Engine	Rolls Royce 250-C47B
Engine Serial Number	CAE-848176
Total time since new	2,256 hours
Aircraft/airframe	
Last major inspection and date:	02 April 2021
Total hours since the last inspection:	TBN
Total hours since the last COA:	TBN
Maximum take-off Weight	2,381 Kgs (5,249lbs)
Maximum Landing Weight	1,440 Kgs (3,175lbs)
Maximum Operating Altitude	17,600 ft

The Aircraft's technical records indicated that it underwent inspection on 2 April 2021 as per Approved Maintenance Program Ref: PENIAL/AMP/407, Work order No. 202100020016, and a Certificate of Release to Service (C. R. S.) issued.

The total aircraft hours recorded during that maintenance was 2,500 since new.

1.6.1 Fuel

The fuel used was AVGAS 100/100LL.

1.7 Meteorological Information

The prevailing weather conditions between 1000 (1300) and 1330 (1630) comprising no rains, calm to light winds, scattered clouds, and good visibility was not associated with aviation hazard.

1.8 Aids to Navigation

Not applicable

1.9 Communication

There were no known communication difficulties.

1.10 Aerodrome information

There was no aerodrome involved in this investigation

1.11 Flight Recorders

The aircraft was not fitted with flight recorders and it was not a requirement by the KCAA regulations.

1.12 Wreckage and Impact Information

The helicopter was substantially damaged during the accident, broken into two fragments spread over an area of about 26 m x 27 m.

The main wreckage included the helicopter frame assembly, skin, fairing assembly of both sides, shell assembly of the lower cabin, aft cabin, cowlings, firewalls, longerons, roof beams and panels were found resting to the left.

A separated section of the tail boom, severed near its mid-section, the empennage, tail rotor driveshaft sections, and tail rotor blade debris were to the north of the main wreckage and were generally intact with the crosshead, pitch change links, and the tail rotor gearbox connector shaft. All the four main rotor blades remained attached to the rotor hub but broke off at the midspan from the tip leaving evidence of the twisted fiber material and longitudinal crack.

The components of the fuel and hydraulic system were generally intact with evidence of minimal hydraulic leakage. Tail rotor drive continuity could be demonstrated from the tail rotor through the tail rotor gearbox. The tail rotor was able to be rotated by hand in both directions with no binding or abnormal sounds coming from the tail rotor gearbox. The two engine magnetic chip detectors were removed in situ and visually inspected with no chips or flakes observed.

The LH cockpit side door and cabin door were found cracked (fig 4) and partially crushed with door hinges distorted. Examination of the site revealed two depressions in the ground consistent in size and shape with the helicopter's landing gear skids and main rotor blades.

Figure 6: The tail boom after the accident



1.12.1 Emergency locator transmitter

The aircraft is equipped with an ELT and it did not activate.

1.13 Medical and Pathological Information

After the accident, the two occupants were rushed to a nearby hospital for a medical checkup.

1.14 Fire

There was no fire

1.15 Survival Aspects

The Accident was survivable. The pilot and the passenger escaped with minor injuries.

1.16 Tests and Research

Detailed investigation of the accident including recovered aircraft parts and components is ongoing.

1.17 Organizational and Management Information

Penial Air Limited (PAL) is a company incorporated on 8 September 2006 located off Langat Road Block 60, Wilson Airport, and P.O. Box 4842-00506, Nairobi. The company has a valid Air Operator Certificate (AOC) number 160, expiry due on 30 November 2021. The company has a total of two (2) helicopter pilots. Based on the Air Service License issued on 30 December 2019, the company operated a total of eleven (11) aircraft. The fleet was composed of Bell 206, Bell 407, B744, B733, F50, DHC8, AS350, EC130, C206, C208, and C210. The company was involved in non-scheduled air services, passenger/freight, domestic scheduled air services, and passenger/cargo/mail and aerial work services.

1.18 Additional information

The investigation is ongoing and a final report is expected to be published once the investigation is complete.

1.19 Useful or Effective investigation techniques

Not applicable

Martyn Lunani

CHIEF INVESTIGATOR OF ACCIDENTS

10/06/2021