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AIR ACCIDENT INVESTIGATION

Factual Accident Report to
Cessna 152
Registration 5Y-BYQ
at Malindi Airport Kilifi
on 7th April 2016

This investigation has been carried out in accordance with the Civil Aviation (Aircraft Accident and Incident Investigations) regulations 2013. The objective of the investigation of an accident or incident shall be the prevention of accidents and incidents. It shall not be the purpose of such an investigation to apportion blame or liability.

CIVIL AIRCRAFT FINAL ACCIDENT REPORT
5Y-BYQ

OPERATOR : Kenya School of Flying

OWNER : Kenya School of Flying

AIRCRAFT TYPE/SERIAL NO. : Cessna 152/15281936

MANUFACTURER/YEAR : Cessna Corporation/1978

REGISTRATION : 5Y-BYQ

PLACE OF OCCURRENCE : Malindi Airport

TYPE OF FLIGHT : Training

DATE OF OCCURRENCE : 7th April, 2016

PIC'S EXPERIENCE : 1594 Hours

TIME : 0542 HOURS

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

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ABBREVIATIONS

AAID	-	Air Accident Investigation Department
AC	-	Advisory Circular
ATO	-	Approved Training Organization
CFI	-	Chief Flight Instructor
CPL	-	Commercial Pilot License
HKIK	-	Orly Airpark Aerodrome
ICAO	-	International Civil Aviation Organization
KCAA	-	Kenya Civil Aviation Authority
KSF	-	Kenya School of Flying
NOTAM	-	Notice to Airmen
SPL	-	Student Pilot License
USA	-	United States of America
UTC	-	Universal Coordinated Time
WGS	-	World Geodetic System (1984)

SYNOPSIS

The report describes 7th April 2016 aircraft accident involving a Kenya School of Flying owned C152 type of aircraft registration 5Y-BYQ, after the student pilot unconsciously got struck by a spinning propeller on her left arm immediately after landing at Malindi Airport. The student pilot was due for her first solo flight training.

The report discusses history of the flight, particulars of the crew, aircraft information, flight training school, medical examination of the student pilot and the circumstances preceding her training. The report further discusses investigation analysis, probable cause, investigation findings and safety recommendations.

The investigation findings revealed that the instructor pilot had a valid commercial pilot license with instructor rating and the aircraft had a valid certificate of airworthiness. There was no weather that day which would adversely affect flight training. The student pilot also held a valid student pilot license and had no medical record which would adversely affect her flight training.

The investigation could not independently find the probable cause of the accident, however a number of contributory factors were identified.

1. FACTUAL INFORMATION.

1.1. History of the Flight

On 7th April 2016, at approximately 0542 hours a Cessna 152, registration 5Y-BYQ owned and operated by Kenya School of Flying, on a flight training exercise was involved in an accident on the parking bay immediately after landing.

It was reported that the school had made prior arrangement for the routine circuit flight training exercise as usual on that day. So at about 6.30 am local time, a group of student pilots accompanied the flight instructor from their hostels in a van to the airport for the training exercise. On arrival at the airport they proceeded to their class where the flight instructor did preflight briefings lessons before flight. After the preflight briefings the flight instructor did two flight training circuits with two student pilots each lasting about 25minutes. He then went for the third student with whom they did 20 minutes aerodrome circuit flight training exercise before they landed after the student pilot complained of being uncomfortable with the prevailing strong cross winds. After landing the student pilot took control and taxied the aircraft upto the parking bay1 where the instructor was expected to pick another student pilot for training. On arrival at the parking bay1, the flight instructor took control and held brakes. While there before the engine was shut down the student pilot disembarked and passed under the struts and walked onto the propeller where she got struck on her left arm. The flight instructor quickly shut off the engine and rushed to provide first aid to the student pilot. He called for an ambulance which arrived within three minutes later. The student pilot was then taken to the nearby hospital but died on arrival due to excessive bleeding.

1.2 Injuries to Persons

Table 1: Injury chart

Injuries	Crew	Passenger	Others	Total
Fatal	1	0	0	1
Serious	0	0	0	0
Minor/none	1	0	0	0
Total	2	0	0	2

1.3 Damage to Aircraft

Slightly damaged in which there was a bend on the propeller.

1.4 Other Damages

None

1.5 Personnel Information:

1.5.1 Instructor Pilot

1.5.1.1 Particulars of the Instructor Pilot

The instructor pilot was 29 years old and he held a valid Commercial Pilot License issued on 3/2/2016 expiring on 10/2/2017. He was endorsed with instructor rating on C150, C152, and C172 issued on 2/4/2014. He held a Kenya Civil Aviation Authority (KCAA) Class One Medical Certificate examined on 11/1/2016 valid for a period of 12 months.

1.5.1.2 Experience of the Instructor Pilot

Records obtained from KCAA indicated that the instructor pilot had a total of 1615 hours. He had additional aircraft type rating on PA34 and C206. He held aviation English proficiency level 5 endorsement on his license issued on 2/4/2014 valid until 26/7/17.

Other records indicated that on 24/3/2016, he had a total of 1594 flying hours. He had accumulated a total of 1242 instructional hours with 358 hours within the last twelve months preceding the date.

1.5.2 Student Pilot

1.5.2.1. Particulars of the Student Pilot

According to the records obtained from KCAA, by the time of the accident the student pilot was 19 years old. A copy of the medical certificate obtained indicated she held medical class two certificate issued on 23/11/15 valid for a period of 24 months. Additional information indicated that she had a student pilot license issued on 4th February 2016 valid until 22/11/2017. The medical certificate bared “licensee holder shall wear corrective lenses” and during the time of the accident she had her glasses on.

1.5.2.2 Aviation Doctor’s Examination Report

An interview report from the medical examiner who conducted suitability test on the student pilot revealed no history of any medical or psychological challenges with the deceased.

1.5.2.3 Training records of the Student Pilot

1.5.2.3.1 Flight training at Kenya School of Flying

Training records obtained from the school indicated that the student pilot was trained by four different instructors at three different airports. She was also trained on two different aircraft types namely Cessna 150 and Cessna 152. Most her training was conducted using c152 on which shed had done more than ten hours.

She was first assessed on a flight by instructor 1 on 10/12/2015 at Nairobi Wilson Airport. The same instructor continued with her second, third and fourth flight training sessions which accounted for a total of 2 hours and 20minutes of training which were all conducted on C150.

The fifth flight training was conducted by instructor 2 on C150 who qualified the student pilot with a grade of seven points out of 12. The student pilot was then relocated to Orly airport where she undertook further flight training with the instructor 3 on C150. At Orly airport the student pilot did a total of four hours and fifty five minutes.

The student pilot was again relocated to Malindi airport where the school has a satellite training centre. At Malindi the student pilot was introduced to C152 for the same training with instructor 4. She did a total of 10 hours and 35 minutes training with instructor 4 after which he released the student to instructor 1 on the same type of aircraft. The day before the accident (6/4/16) they had done 35 minutes of training with instructor 1.

1.5.2.3.2. Kenya Civil Aviation Authority Private Pilot Theory Examination

Record obtained from KCAA indicated that the student pilot sat for radio telephony examination on 18th February 2016 and passed with 78%. Additional examination on private pilot license ground subjects indicated that the student passed with over 95% in all the six subjects examined. She scored 98% in air law, 98% in flight performance and planning, 95% human performance and limitation, 95% on meteorology, 100% on general navigation and 100% on navigation plotting.

1.6 Aircraft Information

1.6.1. General Description

Cessna 152 is high-wing monoplane of all metal semi-monocoque construction. The aircraft is equipped with fixed tricycle landing gear with tubular steel legs surrounded by a full length fairing with a step for access to the cabin. The nose-wheel is connected to the engine mount and has an oleo-strut to dampen and absorb normal operating loads. The aircraft is powered by one Lycoming O-235-L2C type of engine producing 110BHP at 2550rpm. It is normally aspirated,

direct drive, air-cooled, horizontally opposed, carburetor equipped, four cylinder engine. The aircraft is fitted with fixed pitch McCauley propellers model no IA103/TCM6958. The aircraft is certified for single pilot operation with two seats only. It is equipped with dual control differential ailerons and single-slotted flaps which are electrically operated to a maximum of 30°. The rudder can move 23° either side or its fitted with a ground-adjustable trim tab. The elevator can move up 25° and down through 18°. An adjustable trim tab is installed on the right elevator and is controlled by a small wheel in the centre of the console.

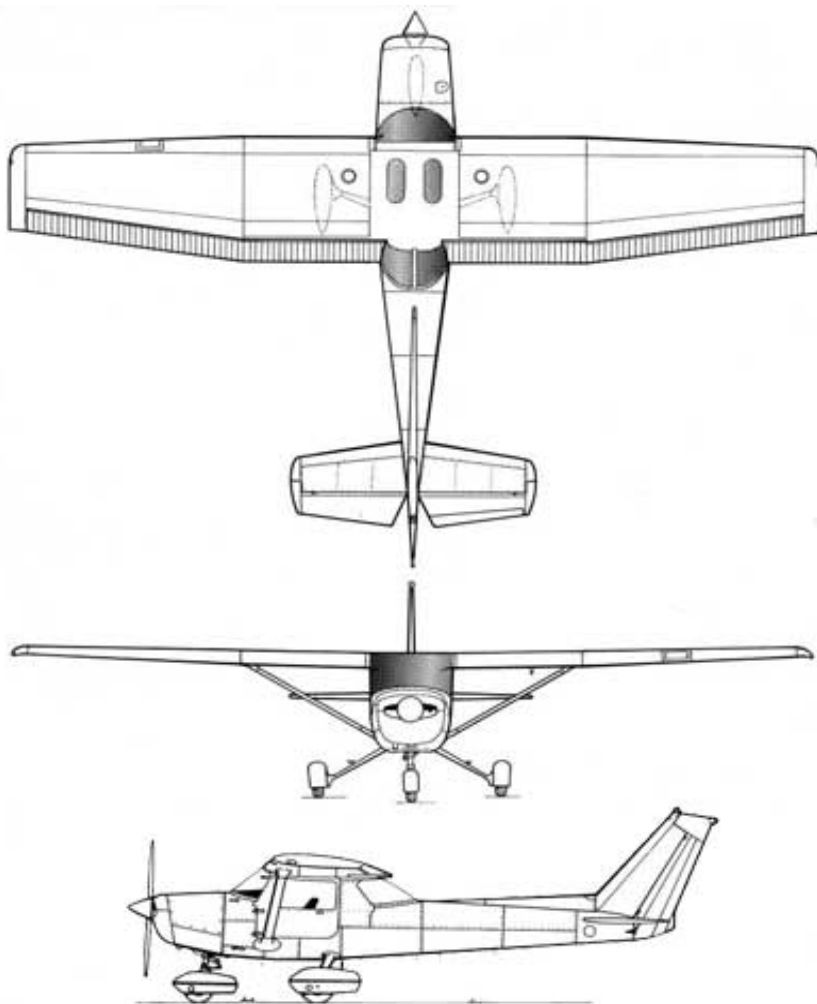


Figure 1: Photograph showing three different cross-sectional view of C152

1.6.2 Aircraft Records

Information obtained from KCAA indicated that the aircraft C152 Serial Number 152-81936 was manufactured in 1978 by Cessna Co. United States of America (USA). It was fitted with a single engine, type L-0-235-L2C, Serial Number L15800-15. It had McCAULEY two blade fixed pitch type of propeller Number IA103/TCM6958. The aircraft had a total of 4998 airframe hours and a total of 2703 engine hours.

Additional records indicated that the aircraft was initially registered in the USA FAA register as N67595. It was issued with export certificate to Kenya on 13/10/2010. It was deregistered from FAA register on 24/2/2011.

It was first issued with a certificate of registration by KCAA on 11/3/2011. By the time of the accident the aircraft had a valid certificate of airworthiness issued on 23/11/2015 valid until 22/11/2016.

1.7. Meteorological Information

Information obtained from meteorological office indicated that simultaneously, visibility was greater than 10km; there was no cumulonimbus or towering cumulus at any height and no cloud below 5000ft.

1.8 Aids to Navigation

Not applicable.

1.9 Communication

No technical communication problem was reported by the pilot.

1.10 Aerodrome Information

Malindi airport is situated on WGS84 coordinates S03°13'22.9'' E040°06'01.7'' and its 2NM south west of Malindi town. It operates between 6.30am and 5.00pm local time. It has no

medical facility at the aerodrome. It has category 5 rescues and fire fighting services. It has L-shaped four bitumen runways designation 17/35 and 08/26. Runway 17/35 measures 1402m by 30m and runway 08/26 measures 1020m by 30m. Runway 17/35 has approach and runway lighting and 08/26 has nil.

The aerodrome has one apron with three parking bays designated as Bay 1, Bay2 and Bay3.



Figure 2: A section of Malindi airport map showing the aircraft track and the accident site

1.11 Flight Recorders

The aircraft was not equipped with a flight data recorder or a cockpit voice recorder. Neither recorder was required by the Civil Aviation Regulations.

1.12 Wreckage and Impact Information



Figure 3: A photograph showing the accident aircraft and the bent propeller blade



Figure 4: A photograph showing the scene of the accident site.

1.12.1 Structural Damage

Post-accident inspection of the aircraft revealed that the right wing tip chipped off as it collided with the aircraft hangar, the nose wheel broke and separated, the aircraft dome broke off, the aircraft empennage got distorted and the wings got several dents.

1.13 Medical and Pathological Information

There was no evidence that physiological factors or incapacitation affected the performance of flight crew members prior to the accident, however the postmortem conducted on the deceased indicated that she died due to excessive bleeding due to deep cuts sustained from the propeller.

1.14 Fire

Not applicable

1.15 Survival Aspects

The accident was not survivable

1.16. Tests and Research.

Nil

1.17. Organizational and Management Information

1.17.1. Kenya school of flying

Kenya School of Flying is a flight training organization approved by Kenya Civil Aviation Authority to conduct flight training programs on private pilot license, commercial pilot license, instrument rating and flight operations officer dispatch. It has one Chief Flight Instructor (CFI) and six flight instructors. The approved training school has its main principal training centre located at Nairobi Wilson airport. It also has three other satellite training centres located at Malindi, Kajiado and Ukunda. The school has a total of 14 training aircraft which includes five (5) C150, four (4) C152, one (1) PA28, three (3) C172 and one (1) PA34. It also has REDBIRD FMX type of simulator training device.

Records obtained from KCAA indicated that by the time of the accident the school had approved training organization certificate issued on 30th March 2016 valid for one year and which was due to expire on 29th March 2017. A letter from KCAA dated 11th March 2016 obtained from the records indicated that training manuals had been reviewed and found satisfactory as per KCAA ATO regulations no. 15.

1.17.2. The Air Traffic Control Services

Information obtained from the air traffic services at Malindi indicated that, before the accident, the crew held normal landing procedures and there was nothing to suggest if the crew had any problem with the flight.

1.18. Additional Information.

1.18.1. Witness Submission

1.18.1.1. Chief Flight Instructor

Submission given by the CFI indicated that the school had a facility (hostel) on which both the instructor and student pilot live. On 7th April 2016 at approximately 6.00am local time, the CFI, the deceased and three other students boarded the same vehicle from the hostel to the airport. They arrived at the airport at approximately 6.17am local time and went through the normal airport security checks before going to their preflight briefing room within the airport. At the preflight briefing room the CFI did quick briefings on the training for the day before flight training exercise.

Thereafter, the CFI did two flight training circuits with two student pilots. He then took the deceased as a third student for the flight training circuit. According to CFI, at first the deceased did the usual aircraft preflight inspection and later took her seat in the aircraft. She was then joined by CFI. On her own she did basic checklist very well. Under the instruction of the CFI she took the command and took off and went through the entire circuit as the CFI monitored. During approach to land CFI noticed that she was slightly unstable and he took control and landed the aircraft. After landing she taxied the aircraft to apron after which the CFI took control of the aircraft and braked. While at the parking bay and before the engine was shut the deceased disembarked and went through the struts and onto the propeller.

1.18.1.2. Roommate student pilot

According to information by a fellow student pilot who happened to be roommate to the late, explained that the previous day they spent together discussing about their normal lives before they went to sleep. They watched movies and discussed about preparation for their flights the following day. Her roommate went to sleep by 9.00am local time and left the late watching movies. The following day they walk up early and took breakfast and travelled together to the airport. She was all even though even though she was a sigh lady.

1.19 Useful or Effective Investigation Techniques

Not applicable

2. ANALYSIS

2.1. The Instructor pilot

The instructor pilot held a valid Commercial Pilot License issued on 3rd February 2016 expiring on 10th February 2017. He was also endorsed with an instructor rating on C150, C152 and C172 issued on 2nd April 2014 and authorized to fly as a pilot in command on C150, C152 and C172. He held a valid Kenya Civil Aviation Authority (KCAA) Medical Certificate Class I issued on 11th January 2016 valid for twelve months. He had a total of 1615 hours by the time of the accident. He had accumulated a total of 1242 instructional hours. He had a total of 358 hours on the type (C152).

2.2. Student Pilot

The student pilot held a valid student pilot license issued by KCAA. She also held a valid KCAA Medical Class II Certificate with limitation to wear corrective lenses. Records obtained from KSF indicated that the student pilot was trained on two aircraft different type of aircraft with four different instructors. The remarks made on her training log-sheet revealed that she was

progressing well as she was an average student. All her instructor's indicated that they had no problem with her flight training.

2.3. Medical Examiner report

The report from medical examiner indicated that student pilot had no medical history that would adversely affect her flight training.

2.4 Kenya School of Flying

According to the records obtained, by the time of the accident the school had a valid approved training organization certificate and all the training manuals were approved and met the minimum requirements by KCAA.

2.5 KCAA theory examination

Records from KCAA regarding her private pilot ground examination indicate that she passed her examination on her first attempt with 95%. She also passed her radio telephone examination with 78%.

2.6 Aircraft information

By the time of the accident the aircraft had a valid airworthiness certificate. It was also equipped and maintained in accordance with KCAA regulations. There was no substantial damage on the aircraft except a small bent on one of the propeller blade.

2.7. Interview report on the deceased roommate

The interview report from the deceased roommate revealed nothing sinister about the deceased prior the accident.

2.8. Air Traffic Control Service

There was nothing obtained from air traffic service to suggest if the crew experience before landing the flight.

3. CONCLUSIONS

3.1 Findings

- 3.1.1. The pilot had a valid commercial pilot license endorsed with instructor rating and was authorized to fly the aircraft
- 3.1.2. The aircraft had a valid certificate of airworthiness.
- 3.1.3. There was no significant weather that would adversely affect the flight
- 3.1.4. The student pilot had a valid student pilot license
- 3.1.5. The report from the medical examiner revealed no medical history that would adversely affect her flight training.
- 3.1.6. The report from the school flight training crew did not reveal any problem with her training
- 3.1.7. Records from KCAA theory examination revealed that the student was above average as she passed all examinations with the first sitting.
- 3.1.8. The flight training school had a valid approve training organization certificate
- 3.1.9. The interview report from her fellow students including that of her roommate indicated that the deceased did not show any deviation from her normal behavior.

3.2 Cause of the accident.

The probable cause of the accident was the student pilot unintentionally walking into a spinning propeller. The investigation identified the following as contributory factors to the accident.

- i. Failure of the instructor pilot to shut down the engine before the student disembarked.
- ii. Pressure by the instructor to train a number of student pilots lined up for flight training that morning.

4.0 SAFETY RECOMMENDATIONS

After considering the circumstances surrounding the above mentioned accident the investigation recommended urgent need to increase safety awareness regarding the dangers post by propellers and the need to follow standard operating procedures while operating aircraft. The investigation therefore recommended that:-

- 4.1. KCAA to ensure that all operators conform to the laid down standard procedures of entering and exiting aircraft.
- 4.2. KCAA to provide appropriate advisory circular on safety guidelines to all personnel working and operating within the proximity of aircraft fitted with propellers. Aircraft operators should also ensure that their personnel especially those working around propeller aircraft receive recurrent safety training on the risks of propellers. Warning signs should be displayed within the aircraft cabin and passenger pre-boarding areas to describe the risks presented by propellers. Crew members to ensure before engine start all personnel are clear of all propellers and that all personnel working in and around the aircraft behave as though the ignition switch is on.
- 4.3. KCAA to ensure that operators especially the flight training schools develop standard operating procedures to be incorporated as part of flight training program to include hazards presented by operating aircraft with propellers.

ANNEX I: POSTMORTEM EXAMINATION REPORT

POLICE 23A

THE KENYA POLICE

(Section 386 C.P.C.)

POST-MORTEM FORM

Reference No. INQURTI 1/2016

POLICE STATION MALINDI, ARPSI

To: THE PATHOLOGIST/MEDICAL OFFICER

STAR HOSPITAL MALINDI

I have to request that you ascertain the cause of the death of PETER NYWALA
whose body is sent herewith under escort of PC EDMUND OIEM

The undermentioned witnesses are able to identify the body to you:—

(1) MEDINA AMEL AJANGO (2)

The body was found at (Place) STAR HOSPITAL on (Date) 7/04/16 at (Time)

Date and Time of Death (if known) 07/04/16 at 10.30 am

The circumstances of the death are as follows:—

(If natural causes is probable, give also a brief medical history, including the name and address of any medical officer consulted.)

On 7/04/16 the deceased (PETER NYWALA) who was a student pilot at Kenya School of flying Malindi was accidentally hit by an aircraft propellers sustaining serious injuries which led to her death at tanfig hospital Malindi while undergoing treatment. Please examine and ascertain the cause of death.

Note.—If death from poisoning is suspected, the officer requesting the examination should also give the following details (see also page 4).

(a) Date and time of onset and duration of symptoms

(b) Main symptoms. Please put a tick against any of the following symptoms that apply:—

Diarrhoea	Constipation	Shivering	Delirium
Vomiting	Cyanosis	Convulsions	Sweating
Thirst	Jaundice	Eye pupil dilated	Unconsciousness
Blindness	Loss of weight	Eye pupil contracted	Internal pains/cramp
Any Odour of Breath	Fever		

(c) Details of food, drink or drugs taken before and after onset of symptoms including times and quantities of any medicine given whilst under treatment

(d) Were other persons affected

(e) Suspect poison, or class of poison

Signature [Signature]
(Police Officer)

Date 07/04/16

Note.—Complete form in quadruplicate. One copy to be retained by the station and three copies to be supplied to Medical Officer. One is for his retention, one to be returned to Station with completed report, one to be forwarded with any exhibits submitted for toxicological or histological examination.

INTERNAL APPEARANCE OF BODY

(1) Respiratory System:

NAD

(2) Cardio-Vascular System:

NAD

(3) Digestive System:

NAD

(4) Genito-Urinary System:

NAD

(5) Head:

NAD

(6) Nervous System:

NAD

(7) Spinal Column:

NAD

(8) Spinal Cord:

NAD

As a result of my examination, I formed the opinion that the cause of death was
CARDIO PULMONARY ARREST SECONDARY TO HEMORRHAGIC SHOCK
WHICH OCCURRED AS RESULT OF DEEP CUT WOUNDS WITH THE
EFFICIENT OF INJURY INVOLVING BOTH FEMORAL & BRACHIAL ARTERIES

Death Certificate No. 639070

The following specimens have been removed for further examination (see notes for guidance on page 4).

DR A. ALW

Signed

Designation

~~DR A. ALW~~
MEDICAL OFFICER