MINISTRY OF TRANSPORT, INFRASTRUCTURE, HOUSING, URBAN DEVELOPMENT AND PUBLIC WORKS

STATE DEPARTMENT FOR TRANSPORT

AIRCRAFT ACCIDENT INVESTIGATION DEPARTMENT

AIRCRAFT ACCIDENT REPORT 06/2020

REPORT ON THE ACCIDENT TO AGUSTAWESTLAND AW119 MK II REGISTRATION 5Y-NPW OPERATED BY NATIONAL POLICE AIR WING AT MERU, KENYA ON 13 JUNE 2020

OBJECTIVE

This report contains factual information which 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 accidents, serious incidents and incidents.

This investigation has been carried out in accordance with The Kenya Civil Aviation (Aircraft Accident and Incident Investigation) Regulations, 2013 and Annex 13 to the ICAO Convention on International Civil Aviation.

The objective of the investigation of an accident or incident under these Regulations shall be the prevention of accidents and 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 Investigation of the Accident.

Investigation Process

The occurrence involved an Agusta Westland AW119 passenger helicopter, registration 5Y-NPW, and was notified to the Aircraft Accident Investigation Department (AAID) through a phone call and affirmed by the ATC.

The National Police Service (NPS) delegated the Investigation to AAID through a letter REF: NPS/IG/SEC/2/16/VOL.XXVII (10) dated 14 June, 2020. An investigator was dispatched to the site on 15 June 2020 for initial onsite investigation and witness interviews.

After the initial on-site investigation phase, the occurrence was classified as an 'Accident' owing to the substantial damage to the Aircraft.

AAID notified the Italian Agenzia Nazionale per la Sicurezza del Volo (ANSV),being the Civil Aviation Safety Investigation Authority of the State of the Manufacture and Design, and the Canadian Transport Safety Board (TSB), being the authority of the State of Manufacture of the engines. Accredited Representatives were assigned and assisted by Advisers from Leonardo Helicopters.

AIRCRAFT ACCIDENT INVESTIGATION

OPERATOR:	Police Airwing
AIRCRAFT TYPE/:	Agusta Westland AW119MKII
MANUFACTURER:	Leonardo Helicopters
YEAR OF MANUFACTURE:	2014
AIRCRAFT REGISTRATION:	5Y-NPW
AIRCRAFT SERIAL NUMBER:	14946
DATE OF REGISTRATION:	02/03/2018
TYPE OF ENGINE:	OnePratt & Whitney Canada PT6B-37A Turboshaft Engine
DATE OF OCCURRENCE:	13/06/2020
TIME OF OCCURRENCE:	0430
LOCATION OF OCCURRENCE:	Cyompiou, Kaithe area, Meru
TYPE OF FLIGHT:	Surveillance
NUMBER OF PERSONS ON BOARD:	06
INJURIES:	One minor, 3 serious
NATURE OF DAMAGE:	Substantial
CATEGORY OF OCCURRENCE:	Accident
PIC'S FLYING EXPERIENCE:	CPH (H) /670 Hours

All times given in this report is Coordinated Universal Time (UTC), with East African Local Time in parenthesis.

TABLE OF CONTENTS

TABLE OF FIGURES

ABBREVIATIONS

AAID	-	Air Accident Investigation Department
AD	-	Aerodrome
AGL	-	Above Ground Level
AIP	-	Aeronautical Information Publication
AMSL	-	Above Mean Sea Level
ANSV		Agenzia Nazionale per la Sicurezza del Volo of Italy
ATC	-	Air Traffic Services
ATPL	-	Airline Transport Pilot License
AW		AgustaWestland
CPL	-	Commercial Pilot License
CVR	-	Cockpit Voice Recorder
ELT	-	Emergency Locator Transmitter
FDR	-	Flight Data Recorder
GFS	-	Ground Flight Safety
HKJK	-	Jomo Kenyatta International Airport
HKNW	-	Wilson Airport
ICAO	-	International Civil Aviation Organization
IFR	-	Instrument Flight Rules
IG	-	Inspector General
IR	-	Instrument Rating
KAA	-	Kenya Airports Authority
KAF	-	Kenya Air force
KAPU	-	Kenya Airport Police Unit
KCAA	-	Kenya Civil Aviation Authority
KMD	-	Kenya Meteorological Department
LT	-	Local Time
NEAL	-	North East Access Lane
NPS	-	National Police Service
NPSAW		National Police Service Air Wing
PF	-	Pilot Flying
PM	-	Pilot Monitoring
QNH	-	Altimeter setting related to sea level
SDT	-	State Department for Transport
TSB	-	Transportation Safety Board of Canada
VFR	-	Visual Flight Rules

SYNOPSIS

The report describes the 13 June 2020 aircraft accident involving Agusta Westland AW 119 MKII helicopter type registration 5Y-NPW operated by the National Police Service Air Wing (NPSAW). The aircraft took off from Wilson Airport with three occupants under Visual Flight Rules, landed in Embu where three more persons embarked before it crashed in Meru while enroute to Isiolo.

The Aircraft Accident Investigation Department (AAID) was notified by unidentified caller an accident involving 5Y-NPW in Meru at about 0505 the same day. The notification was confirmed by the Manager Air Traffic Control (ATC).

At 0430 hours on 13 June 2020, Agusta Westland helicopter AW 119 registration 5Y-NPW crashed in Meru. The two pilots and the four passengers were extricated from the wreckage with injuries of varying degrees. The aircraft was damaged after colliding with trees and the terrain.

As per the International Civil Aviation Organization (ICAO) requirement, AAID notified Agenzia Nazionale per la Sicurezza del Volo of Italy, the State of manufacture of the AW 119 aircraft and the Transportation Safety Board of Canada the State of manufacture of the powerplant.

Investigation of the accident involving 5Y-NPW is ongoing to determine the facts, conditions and circumstances of the accident in order to establish the probable cause. However, initial findings revealed that the helicopter rotor blades contacted tree branches before colliding with two other trees and the terrain in fog.

1.0 FACTUAL INFORMATION

1.1 History of the Flight

On 13 June 2020, Agusta AW119 MKII helicopter was involved in an accident in Meru. The sector was being flown by a Pilot in Command (PF) and a Copilot (PM) and had 4 passengers on board.

As per the adopted practice in the organization for carrying out such missions, the Commandant of the organization informs the crew about the flight program for the next day in advance. The team was therefore appropriately briefed by the Commandant on 11 June 2020 about the North Eastern Peace Mission two days before the day of the operation. The mission was to involve two helicopters; AW 139 and AW 119. The first helicopter, AW139 was to lift off from Wilson airport, fly to Garissa, Wajir and then Badan Arero in Marsabit. The second helicopter AW 119, whose flight was to emanate from Wilson airport via Embu to pick up three passengers, route to Marsabit before ending at Badan Arero in Marsabit.

After filing the flight plan, the crew familiarized themselves with the notams and the weather before lifting off at Wilson airport at 0357 with the two flight crew and one passenger. They were cleared to route via the North East Access Lane (NEAL) through the Ndula Marker (the Visual Navigation aid). All these events were uneventful, and as per the cockpit crew, there was no abnormalities observed on the helicopter during preflight checks, weather briefing, and subsequent lift off.

The crew reported that while routing through the NEAL, the weather ahead of the flight path appeared to deteriorate, prompting them to execute a landing at a position about four miles to the west of Ndula marker at about 0414.

The helicopter lifted off a few minutes after 0440 when the weather conditions ameliorated and elected to fly at low level to Embu, where three more passengers embarked the helicopter and set course for Isiolo.

At around Meru area, the weather conditions appeared to deteriorate and the crew elected to make a landing at an area they had sited. As they approached the landing area in hazy conditions, at low speed, he noticed electric cables in front. In order to avoid the same, he gave a slight bank towards left. He further stated that though he avoided the cables, the main rotors of the helicopter impacted trees that led to vibrations in the cabin. The helicopter then impacted two other trees before it impacted the ground and came to rest on its right side with the main rotor blades hitting the terrain.

The PF shut off the fuel valve and switched off the battery. Both the cockpit crew then came out of the helicopter from the left side. All the passengers evacuated the helicopter from left emergency window. There were reported injuries of varying degrees to the passengers. The crew escaped with minor injuries. The helicopter was substantially damaged during the accident.
There was no fire.

1.2 Injuries to Persons

Injuries	**Crew**	**Passenger**	**Others**	**Total**
Fatal	0	0	0	0
Serious	0	1	0	1
Minor/none	2	3	0	5
Total	0	0	0	6

Table 1: Injury chart

1.3 Damage to Aircraft

The cabin of the helicopter was intact after the accident. All occupant seats were neither damaged nor distorted. The cockpit doors and cabin doors were intact without deformation and their function was normal. The Nose sections showed significant structural damages. All components were recovered and accounted for at the accident site.

The fourglass-fibre composite blades, severed from the main hub at the root. Pitch links and the damper disconnected from the main hub. The Right horizontal stabilizer was found damaged.

Figure 1: The wreckage of the damaged aircraft

Figure 2: The damaged section of the fuselage

1.4 Other Damage

Trees around the accident site and in the path of the flight were found cut from the top by the main rotor blades of the helicopter. Both the surrounding trees and part of the ground suffered lesions after contacting the propellers.

Figure 3: The wreckage at the accident site

1.4 Personnel Information:

1.4.1 Pilot Flying, PF and Pilot Monitoring, PM

Table 2. Crew information		
	Captain, PF	**Copilot, PM**
Age	33	29
Type of license	CPL	CPL
Valid to	26 August 2022	15 March 2021
Rating	A119	R44, AW119
Total flying time (hours)	987.4	623.4
Total on this type (hours)	764.3	351.5
Total last 90 days (hours)	118.7	110.1
Total last 30 days (hours)	38.1	86.2
Total last 14 days (hours)	19.6	45.1
Total last 7 days (hours)	13.7	21.7
Total last 24 hours (hours)	0	0
Last recurrent SEP1 training	25 March 2017	27 December 2016
Last proficiency check	11 November 2016	27 December 2016
Last line check	30 June 2016	26 July 2016
Medical class	1	1
Valid to	14 August 2020	15 March 2021

1.5 Aircraft Information

1.5.1. Aircraft specifications

Agusta AW 119 MK-II aircraft is a single engine helicopter certified in transport category with sub category Passenger, for day operation under VFR. The maximum operating altitude is 15000 feet density altitude and maximum take-off weight is 2850Kgs. The cabin includes the crew compartment (cockpit) and the passenger compartment. Seating is provided for the pilot (right side) and a passenger (or co-pilot) in the cockpit, and up to six passengers in the rear compartment. The aircraft was fitted with a Garmin G1000H PFD/MFD display system.

Figure 4: AW 119 Passenger cabin configuration

The aft section accommodates the fuel tanks, the electrical and electronic equipment compartment and the baggage compartment. The landing gear skid is secured to the undersides of the cabin and rear sections. The tail boom is bolted to the forward fuselage and supports the tail rotor and the relevant drive system. The tail boom includes the stabilizers, the upper and lower vertical fins, the tail skid and the tail cone. The helicopter has four bladed fully articulated main rotors, two bladed tail rotors and a fixed landing gear skid.

Figure 5: AW 119 helicopter

Table 3. Aircraft data at the time of the Accident	
Manufacturer:	Leonardo Helicopters
Model:	AW119MKII
MSN:	14946
Date of manufacture:	26 October 2017
Nationality and registration mark:	Kenya, 5Y-NPW
Certificate of airworthiness	
Number: Issue date: Valid to:	
Certificate of registration	
Number: Issue date:	14946 02 March 2018
Date of delivery	01 November 2017
Total hours since new	925:38
Total cycles since new	856
Last major inspection and date:	100 hours/1 year, 30 May 2020 at 907:51 hours TSN
Total hours since last inspection:	26:56
Total cycles since last inspection:	34

1.5.2 The Engine

The AW119 MKII helicopter is powered by a single Pratt & Whitney PT6B-37A turbo-shaft engine. The engine is a free turbine turbo-shaft propulsion engine incorporating a compressor consisting of 3 axial stages and 1 centrifugal impeller driven by a single-stage compressor turbine. Power is managed by an electronic-hydro pneumatic control system. The engine was not relevant to this Accident. Engine data at the time of the Accident is illustrated below.

Table 4: Engine Data	
Manufacturer	Pratt & Whitney Canada
Model	PT6B-37A
Serial number	PCE-PU0306
Date installed	20 September 2017
Time since new (hours)	925:38
Cycles since new	858
Time since last inspection (hours)	26:56
Cycles since last inspection	34

1.5.3 Weight and Balance Data

The load & trim sheets for all the sectors were not available, neither were they prepared before the flights.

1.5.4 Fuel Information

The type of fuel used was Jet A-1 as captured by the fuel receipt sheet 2439 dated 13 June 2020 that indicated the helicopter was fueled with 460 litres of fuel, however, the same was not entered in the Technical Log Record Sheet No. 282 dated 13 June 2020. As engine operations were normal prior to the accident, fuel samples were not taken for contamination check as there was no such need.

1.5.5 Means of Emergency Evacuation

The passenger cabin is fitted with a cabin door on each side of the fuselage. These two cabin doors are normally used for embarkation and disembarkation of passengers. In case of emergency, both doors can be used as emergency exits for passenger evacuation. When the cabin doors cannot be opened, all cabin windows on the doors can be jettisoned to allow rapid evacuation of the passengers. The helicopter is fitted with a cockpit door on each side. The upper part of the door is equipped with a push-out type emergency exit window, allowing rapid evacuation of the flight crew. After the accident, both the commander and the first officer evacuated from the cockpit through the left side emergency exit window.

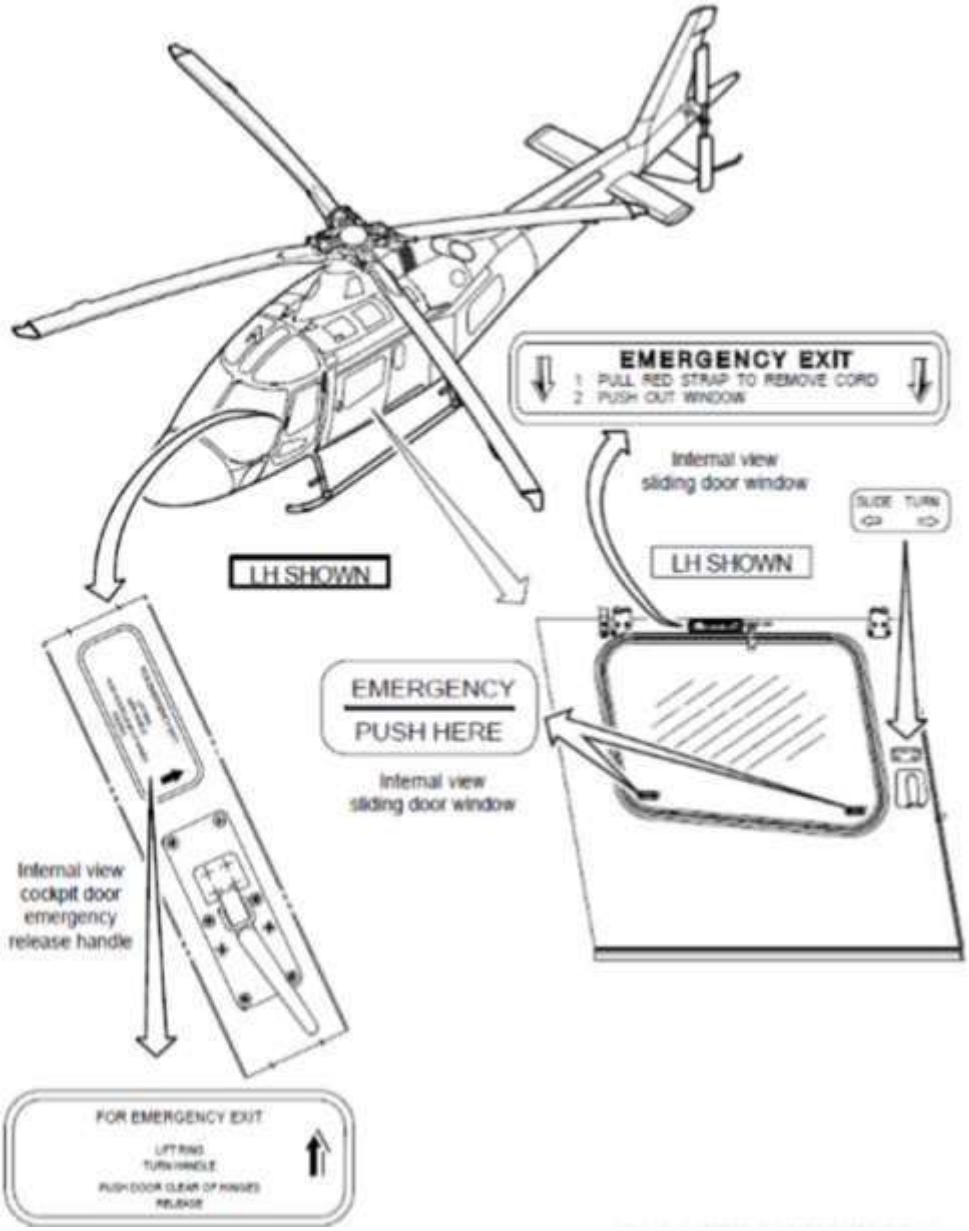

Figure 6: Location and markings of AW119MKII Emergency Release Mechanisms on LH side

1.5.6 Radio communication system

The helicopter was equipped with four radios (designated COM 1 to 4). COM 1 and COM 2 were very high frequency (VHF) radios used by the pilot for communication with air traffic. The air crew (ACM) could talk on the helicopter's internal communication system (ICS) or transmit externally via the installed radios.

Figure 7: ICS control panel

1.6 Meteorological Information

The reported weather by the Kenya Meteorological Department indicated that the weather conditions at the location of the accident at the time of the accident were: generally calm winds, the total cloud cover was overcast OVC (8/8 Oktas) at a height of 1000 feet from the surface in fog.

Figure 8: A picture taken just after the accident depicting fog

1.7 Aids to Navigation

The accident flight was operated under VFR, during which the aircraft was required to remain clear of cloud and the pilots had to maintain in sight of the surface, so visual contact with the surface was the principle method of navigation.

1.8 Communication

The area around Meru where the helicopter was to execute a landing is an uncontrolled airspace; therefore the helicopter was not in contact with any ATC unit. After the accident, the PF relayed the information regarding the accident on telephone.

1.9 Aerodrome Information

N/A

1.10. Flight Recorders

Cockpit Voice Recorder (CVR) and Digital Flight Data Recorder (DFDR) were neither required nor installed.

1.11. Wreckage and Impact Information

1.11.1 General Description of the Site of the Accident

The wreckage was confined within the same area.

Figure 9: The helicopter collided with terrain at Kaithe location 5 nm South East of Meru town close to Cyompiou hill.

1.12.2 Impact Sequence

According to what was learned by the Initial response team, several witnesses (twelve in total, none of them with any specialized aviation knowledge) had sighted the aircraft moments before it crashed into the ground characterized by poor visibility. The sequence of events as reported by the crew and eye witnesses is consistent with evidence at the accident site. The majority of the accounts told of an aircraft on a low altitude controlled flight in fog, flying from North East made a sudden right hand turn to avoid an aerial mast before the blade clipped a tree, nosedived. It then collided with another tree and tumbled to the ground.

Figure 10: The aircraft evaded the mast shown in the picture

Figure 11: The tree branch that first came in contact with the main helicopter rotors


Figure 12: The wreckage and the trees that were involved in the occurrence

1.11.2 Distribution Pattern of the Wreckage

The helicopter was basically intact, except a portion of the main rotor blade which was strewn 15 metres along the flight path from the main wreckage. All the helicopter parts were accounted for at the accident location. There was no evidence of inflight break up.

Figure 13: Part of the main helicopter rotor


Figure 14: The helicopter tail rotor still intact

The exam of the damage sustained by the main rotor blades showed that, at the moment of the collision with the ground, the 5Y-NPW rotors were turning at high speed, just on account of aerodynamic and inertial forces indicated by the shearing off of the blades.

Figure 15: The sheared off main rotors

The cabin was intact. The cyclic, collective, throttle and the pedals appeared normal with no visible deformations. The cockpit and the instrument panel were generally intact. Both the EDUs 1 and 2 (primary and secondary) were still in place.

Figure 16: The cabin, cyclic, collective, throttle and the pedals

1.12 Medical and Pathological Information

The crews were not subjected to Medical check before and after the accident.

1.13 Fire

There was no pre or post impact fire.

1.14. Survival Aspects

1.14.1. Collision Impact

The account of the pilot indicated that they had identified an area to execute landing, and therefore just before the main rotor blades contacted the tree, the helicopter was at low altitude at low speed. Onsite examination of the wreckage revealed that the aircraft collided with terrain at low impact. The accident was survivable.

1.14.2. Search and rescue

After impact with the terrain, the pilot switched off the engine. The second pilot opened the left upper glass console and disembarked unassisted. Members of the public who witnessed the occurrence broke the left rear window and extricated all the passengers. The Captain was the last to come out through the left emergency exit unassisted. The vehicle which was within the crash site was used to transport the injured to the hospital.

1.15 Organizational and Management Information

The National Police Service Air Wing is a fully fledged unit under the National Police Service headed by a Director who reports to the Inspector General. The Unit was established to support the following functions of the NPS.

I. Providing air support to the Service.
II. General government communication flight facilities and carriage of V.I.Ps.
III. Transport air support for the Service, government ministries and other authorized agencies.
IV. Casualty evacuation

Besides the accident helicopter, Police Airwing operates other types of fixed wing aircraft and helicopters (Total 13) without an Air Operator's Certificate these include: four MI-17, two AW 139, four Agusta Bell 206B and two Cessna 208B.

Martyn Lunani
CHIEF INVESTIGATOR OF ACCIDENTS-KENYA
13 July 2020