



REPUBLIC OF KENYA



MINISTRY OF ROADS AND TRANSPORT
STATE DEPARTMENT FOR AVIATION
AND AEROSPACE DEVELOPMENT
AIRCRAFT ACCIDENT INVESTIGATION DEPARTMENT



INVESTIGATION REPORT

REPORT No. 01/02/2023

FINAL INVESTIGATION REPORT ON THE GROUND
COLLISION INCIDENT INVOLVING TWO KENYA AIRWAYS
EMBRAER 190 AIRCRAFT, REGISTRATION 5Y-KYT AND
5Y-KYQ, ON 26 FEBRUARY 2023 AT THE JOMO KENYATTA
INTERNATIONAL AIRPORT, NAIROBI COUNTY, KENYA.

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INTERNATIONAL AIRPORT, NAIROBI
COUNTY, KENYA.





OBJECTIVE

This report contains 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 ground collision incident.

This investigation has been carried out in accordance with ***The Kenya Civil Aviation (Aircraft Accident and Incident Investigation) Regulations, 2024***, and ***the International Civil Aviation Organization's (ICAO's) Annex 13 to the Convention on International Civil Aviation***.

The sole 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 serious incident.



EMBRAER 190 AIRCRAFT

REGISTRATION 5Y-KYT AND 5Y-KYQ

AIRCRAFT ACCIDENT INVESTIGATION DEPARTMENT

AIRCRAFT ACCIDENT PRELIMINARY REPORT SUMMARY

OPERATOR	:	Kenya Airways Plc
AIRCRAFT TYPE	:	Embraer E190
MANUFACTURER	:	Embraer S.A.
YEAR OF MANUFACTURE	:	2012
AIRCRAFT REGISTRATION	:	5Y-KYT
AIRCRAFT SERIAL NUMBER	:	190-0544
DATE OF REGISTRATION	:	22 October 2018
NUMBER AND TYPE OF ENGINE	:	Two, General Electric CF 34-10E6
DATE OF OCCURRENCE	:	26 February 2023
LAST POINT OF DEPARTURE	:	Moi International Airport, Mombasa
POINT OF INTENDED LANDING	:	Jomo Kenyatta International Airport, Nairobi
TIME OF OCCURRENCE	:	0206 (0506)*
LOCATION OF OCCURRENCE	:	Jomo Kenyatta International Airport, Nairobi
TYPE OF FLIGHT	:	Commercial Passenger Scheduled
NUMBER OF PERSONS ON BOARD	:	92
INJURIES	:	None
NATURE OF DAMAGE	:	Minor
CLASS OF OCCURRENCE	:	Incident
PILOT IN COMMAND	:	ATPL holder
PIC FLYING EXPERIENCE	:	6,827.2 hours

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

INVESTIGATION PROCESS

The ground collision incident of 26 February 2023, involving two Kenya Airways Embraer 190 aircraft registration 5Y-KYT and 5Y-KYQ at the Jomo Kenyatta International Airport, Nairobi, was notified to the Aircraft Accident Investigation Department (AAID), State Department for Aviation and Aerospace Development (SDAAD) of the Ministry of Roads and Transport through a phone call by Kenya Airways safety office.

AAID investigators were deployed to the site to conduct an initial onsite investigation and witness interviews.

After the initial on-site investigation phase, the occurrence was classified as an “incident” in accordance with the International Civil Aviation Organization’s (ICAO) Annex 13 provisions.

Subsequently, in accordance with ICAO Annex 13 protocols, the AAID notified the following:

- 1) The National Transport Safety Board (NTSB) of the USA as the aircraft accident investigation authority of the State of Design and Manufacture of the aircraft;
- 2) Centro de Investigação e Prevenção de Acidentes Aeronáuticos (CENIPA) of Brazil;
- 3) The International Civil Aviation Organization (ICAO).

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**Photos and figures used in this report are taken from different sources and may be adjusted from the original for the sole purpose of improving the clarity of the report. Modifications to images used in this report are limited to cropping, magnification, file compression or enhancement of colour, brightness, contrast or addition of text boxes, arrows or lines.*

LIST OF ABBREVIATIONS/GLOSSARY OF TERMS

AAID	-	Aircraft Accident Investigation Department
Aerodrome Operator	-	Kenya Airports Authority
AFTN	-	Aeronautical Fixed Telecommunications Network
AMO	-	Approved Maintenance Organization
CCTV	-	Closed Circuit Television
CVR	-	Cockpit Voice Recorder
CVFDR	-	Cockpit Voice Recorder Flight Data Recorder
ELT	-	Emergency Locator Beacon
FDR	-	Flight Data Recorder
GFS	-	Ground Flight Safety
HKJK	-	Jomo Kenyatta International Airport
KAA	-	Kenya Airports Authority
KCAA	-	Kenya Civil Aviation Authority
METAR	-	Meteorological Terminal Aviation Routine Weather Report
NM	-	Nautical miles
PIC	-	Pilot-In-Command
PPL	-	Private Pilots' License
TSN	-	Time since New





SYNOPSIS

On 26 February 2023, a ground collision incident occurred at the Jomo Kenyatta International Airport (HKJK) involving a Kenya Airways Plc Embraer E190 aircraft registration 5Y-KYT and a parked (non-operational) Kenya Airways Embraer E190 aircraft registration 5Y-KYQ.

Upon landing at HKJK from Moi International Airport in Mombasa County at 0200 (0500), a Kenya Airways Embraer E190 aircraft registration 5Y-KYT (Flight KQ625) with 92 on board was in the process of parking to the left abeam J2 bay at 0206 (0506) under guidance of a Kenya Airports Authority marshaller when its right-wing tip came into contact with the left-wing tip of a parked (non-operational) Kenya Airways Embraer E 190 aircraft registration 5Y-KYQ.

Both aircraft sustained minor damage to both wing tips. There was no pre- or post-incident fire or fuel leak.

The probable cause of the ground collision incident was identified as:

- 1) The ground crew's failure to allow sufficient clearance between the two aircraft resulted in a wingtip collision and subsequent minor damage to the two aircraft's wingtips.

The contributing factors were:

- 1) Lack of proper coordination between the ground crew;
- 2) Constrained parking space at HKJK;
- 3) The absence of wing walker/s;
- 4) The lack of a functional dedicated apron radio frequency; and
- 5) The lack of effective Aeronautical Fixed Telecommunications Network (AFTN) coordination procedures between apron control and the tower.



1. FACTUAL INFORMATION

1.1. THE HISTORY OF THE FLIGHT

On 26 February 2023, a ground collision incident occurred at the Jomo Kenyatta International Airport (HKJK) involving a Kenya Airways Plc Embraer E190 aircraft registration 5Y-KYT and a parked (non-operational) Kenya Airways Embraer E190 aircraft registration 5Y-KYQ.

Kenya Airways Embraer E190 aircraft registration 5Y-KYT (Flight KQ625) with 87 passengers, 2 flight crew and 3 cabin crew on board took off from Moi International Airport in Mombasa County at 0115 (0415) and landed at HKJK runway 06 at 0156 (0456). It then taxied to park at an allocated space to the left abeam J2 parking bay.

The Kenya Airports Authority ground safety officer assigned by her supervisors to the task of marshalling the aircraft reported that at 0206 (0506), while marshalling the aircraft to the allocated space, she doubted the wingtip clearance and momentarily stopped the aircraft for assessment and immediately thereafter deemed the space between the two wingtips adequate. She continued marshalling the aircraft when its right-wing tip came into contact with the left-wing tip of the parked 5Y-KYQ at a height of 1,000 mm above the horizontal axis of both wings. She immediately signalled the aircraft to stop, and it came to a halt 2 metres short of its intended stop.

The operator's turnaround coordinator (passenger ramp) reported that the arriving aircraft registration 5Y-KYT halted temporarily on the taxiway to allow the marshaller to position herself at a marshalling position, and upon her arrival the aircraft continued to taxi. The turnaround coordinator stood to the right of the arriving aircraft as she monitored its left wing. A few seconds later, she noticed that the aircraft had stopped and the marshaller left her position, momentarily walked towards the right-wing tip before going back to her marshalling position. Immediately after the marshaller completed the marshalling task, she informed the turnaround coordinator that the two aircraft had collided at the wing tips as she guided the crew to park 5Y-KYT close to the fuel Hydrant Pit FH52B as per the operator's desires.

The flight crew of 5Y-KYT reported that the aircraft was marshalled into bay J2A with 5Y-KYQ aircraft parked overnight at **J2**, resulting in a wing tip collision. The flight crew further reported that it was assigned bay **J2** by operations control and, on approaching the bay, the ground marshaller guided the aircraft towards abeam bay **J2** as there was another aircraft parked at the bay and that, with no markings to indicate the correct alignment into J2A, the crew followed the marshaller's instructions. Approaching the last few feet of marshalling, the aircraft's right-wing tip came into contact with that of the adjacent aircraft and the crew

stopped the aircraft immediately. The crew thereafter notified the maintenance and operations control of the occurrence and filed an air safety report.

All occupants exited the aircraft unaided. No injuries were reported.

There was minor damage to both wing tips and no fuel leak or fire.



Figure 1: A photo depicting the stationary aircraft 5Y-KYQ parked in J2 parking bay and 5Y-KYT parked in the left allocated space abeam 5Y-KYQ.

A still Closed-Circuit Television (CCTV) camera located in one of the aprons recorded footage capturing 5Y-KYT emerging from the right of the screen, taxiing past J2 parking bay and then turning right to park under the guidance of a marshaller. A few seconds later, a taxiing Ethiopian Airlines aircraft emerges from the left of the screen, taxis for about 19 seconds, then stops. 5Y-KYT moves forward again, albeit for a second, then stops as the footage ends. The location of the apron camera is from the rear of the aircraft.

1.2. INJURIES TO PERSONS

Table A: INJURY CHART

Injuries	Crew	Passengers	Others
Fatal	1	0	0
Serious	0	0	0
Minor/None	5	87	

1.3. DAMAGE TO AIRCRAFT

The aircraft's right wing tip's leading edge sustained slight damage when it came into contact with the left-wing tip of 5Y-KYQ.



Figure 2: A photo depicting the minor damage to the right-wing tip of 5Y-KYT.



Figure 3: A Photo depicting aircraft 5Y-KYT parked in the allocated space.

1.4. OTHER DAMAGE

Aircraft registration 5Y-KYQ sustained minor damage to the trailing edge (the aft) of the left-wing tip and one of the static discharges.

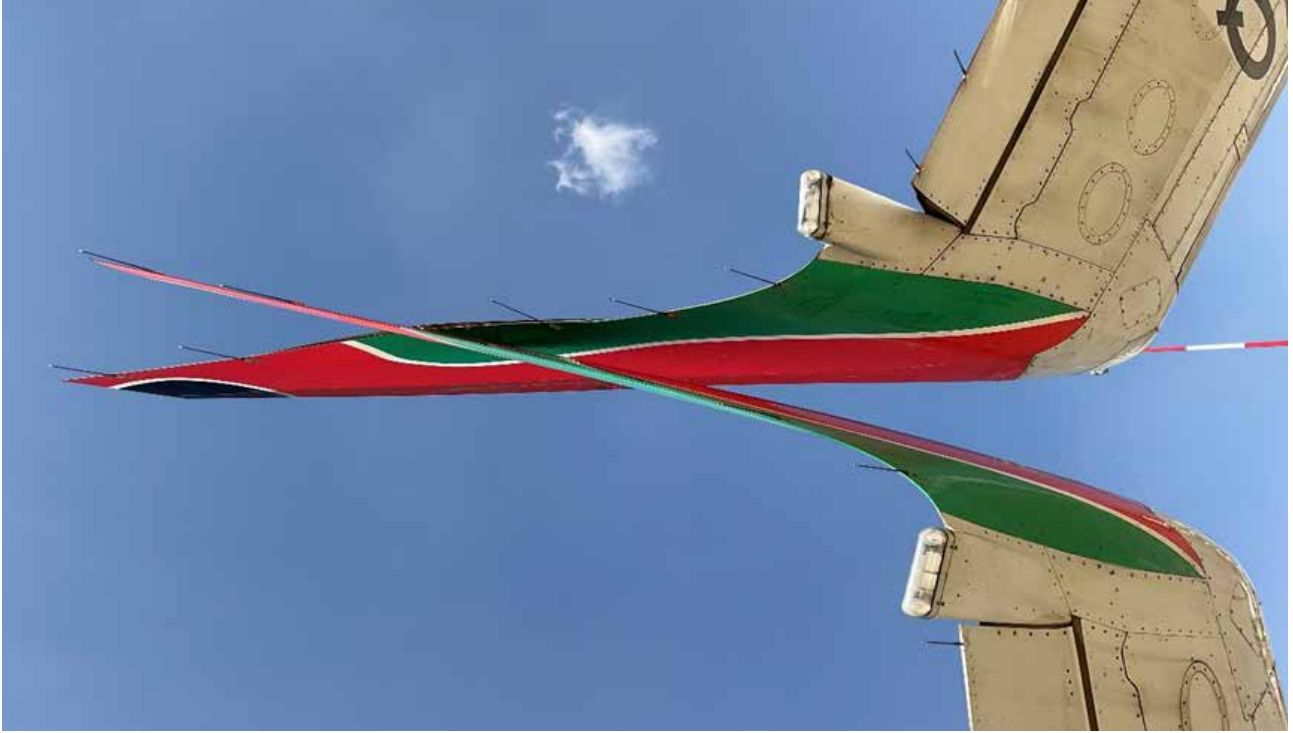


Figure 4: A photo depicting the minor damage to the left-wing tip of 5Y-KYQ.



Figure 5: A photo depicting the point of contact of the two aircraft and the fire station in the background.

1.5. PERSONNEL INFORMATION

1.5.1. The Pilot-in-Command

At the time of the incident, the 35-year-old Pilot-In-Command (PIC) held an Airline Transport Pilot License with Instruments rating valid until 28 April 2023 and a Class 1 Medical Certificate with no limitations/restrictions, valid for 12 months until 30 April 2023 in accordance with the current Kenya Civil Aviation Authority (KCAA) personnel licensing requirements.

Table B: SUMMARY OF THE PILOT-in-COMMAND'S RELEVANT INFORMATION

Pilot license	Airline Transport Pilot License
Medical expiry date	30 April 2023
License expiry date	28 April 2023
Total flying hours	6,827.2
Total hours on type	4,836.6
Hours on type (as PIC)	2,287.8
Hours on type (as co-pilot)	2,548.8
Hours, last 28 days	55.6
Hours, last 14 days	27.7
Hours, last 07 days	10.5
Hours, last 24 hours	2.1
Hours, rest since previous duty	≈ 48

1.5.2. The First Officer

At the time of the incident, the 34-year-old first officer held a Commercial Pilot License with Instruments rating valid until 05 July 2023 and a Class 1 Medical Certificate with no limitations/restrictions, valid for 12 months until 05 July 2023 in accordance with the current Kenya Civil Aviation Authority (KCAA) personnel licensing requirements.

Table C: SUMMARY OF THE FIRST OFFICER'S RELEVANT INFORMATION

Pilot license	Commercial Pilot License
Medical expiry date	07 July 2023
License expiry date	20 July 2023
Total flying hours	2,522
Total hours on type	2,250
Hours, last 28 days	38
Hours, last 14 days	24
Hours, last 07 days	11.5
Hours, last 24 hours	2.2
Hours, rest since previous duty	≈32

1.5.3. Duty officer

At the time of the incident, most of the designated aircraft parking positions were reported to be full, necessitating the acting duty officer to allocate the aircraft parking to the available position.

1.5.4. Marshaller

The marshaller joined Kenya Airports Authority (KAA) in 2010 and was absorbed into Ground Flight Safety (GFS) Section as an Apron Controller in 2012. Upon absorption, the marshaller's role was mainly on Airport Operations Database (AODB). From 2013 to 2018, the marshaller mainly worked at the Apron Control tower on the AODB as well as on Radio as Apron Control Officer and was not assigned any marshalling duties or aerobridge operations during that period.

In 2019, upon completing Marshalling Techniques Training at KAA Training School, he was then assigned duties as a marshaller. Upon this assignment, the marshaller was now authorized by the Shift Duty Officer to operate aerobridges and drive the aerodrome's "Follow-me" vehicles.

Records provided by the aerodrome operator indicated that at the time of the incident, the marshaller had not received the requisite/mandatory training in airport operations.

1.6. AIRCRAFT INFORMATION

1.6.1. General

The incident aircraft is an Embraer ERJ 190-100-IGW (ERJ-190AR), serial number 19000544. It is a four-abreast, narrow - body, short - to medium - range aircraft, powered by high-bypass turbofan General Electric CF34-10E6 twin engines. It is designed and manufactured by Brazilian aerospace manufacturer Embraer – Empresa Brasileira de Aeronáutica S.A.

Table D: SUMMARY OF THE AIRCRAFT'S DETAILS

Manufacturer	Embraer S.A.
Type and model	Embraer 190-100
Serial number	19000544
Aircraft Year of Manufacture	2012
Nationality / Registration Mark	Kenyan, 5Y-KYT
Name of Operator	Kenya Airways Plc
Certificate of Registration	22 October 2018
Validity of Certificate of Airworthiness	18 November 2023
Category of Certificate of Airworthiness	Commercial Air Transport (Passengers)
Total airframe Cycles Since New	21,204
Total airframe time (hours)	22,224.02
Engine type (No.)	2No., General Electric CF 34-10E6
Engine Serial number (No. 1, No.2)	424193, 994738
Engine date of Manufacture (No. 1, No.2)	13/07/2011, 29/09/2009
Engine No.1 Total Cycles Since New	20,087
Engine No.1 Total Time Since New (Hours)	21,004
Engine No.1 time since last shop visit/1 (Hours)	5,127.15
Engine No.1 cycles since last shop visit/1	5,297
Engine No.2 Total Cycles Since New	15,718
Engine No.2 Total Time Since New (Hours)	23,935.35
Engine No.2 time since last shop visit/1 (Hours)	11,074.53
Engine No.2 cycles since last shop visit/1	7,061
Fuel type used	Jet A-1

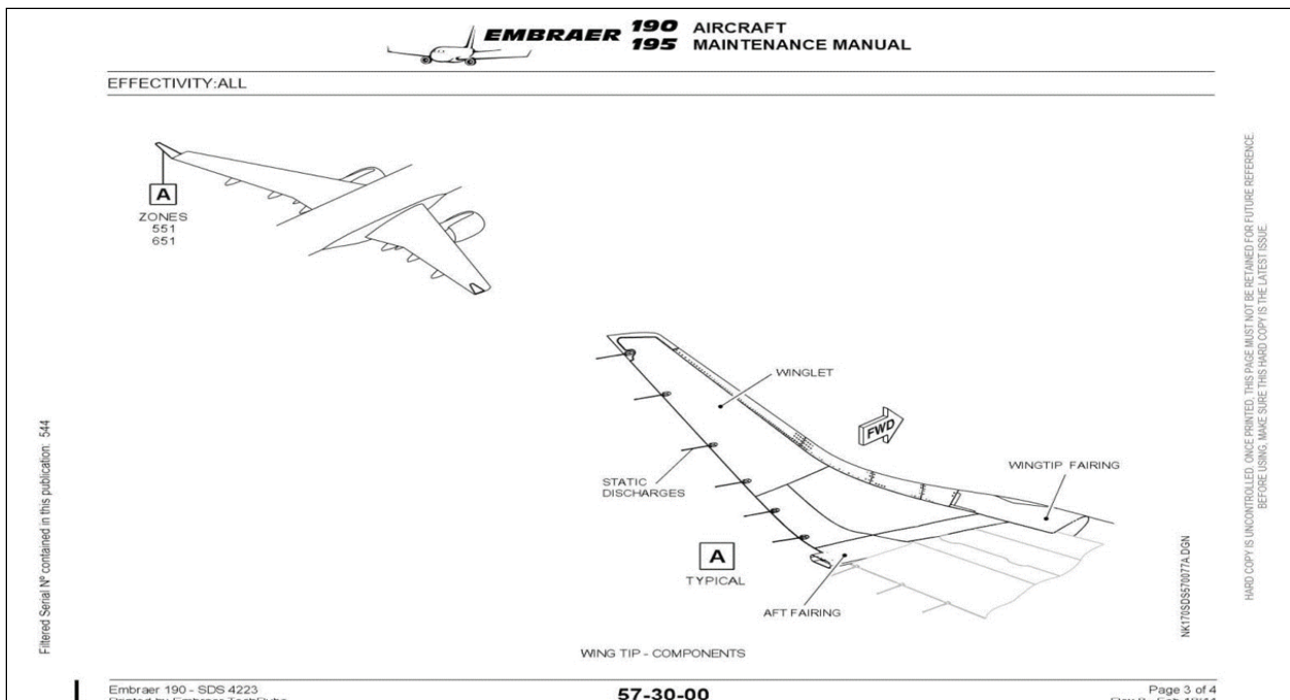


Figure 6: Embraer 190 wing tip schematic (courtesy of the operator).

1.6.2. Maintenance Records

At the time of the incident, the aircraft had a valid Certificate of Airworthiness in the Commercial Air Transport (Passengers) Category issued by KCAA, valid until 18 November 2023. A review of the aircraft records indicated that the aircraft had no outstanding defects prior to the incident flight. The aircraft was certified, equipped, and maintained in accordance with existing KCAA regulations and approved procedures.

At the time of the incident, the aircraft and engines had flown a total of 22,224.02, 21,004, and 23,935.35 hours since new. The aircraft technical Log (TechLog) indicated that the aircraft's arrival fuel at HKJK was 2,530 KG.

1.6.3. Mass and balance

Not considered a factor.



1.7. METEOROLOGICAL INFORMATION

The Aerodrome Routine Meteorological Report (METAR) issued by the Kenya Meteorological Department at 0130 (0430) stated that HKJK Meteorological station experienced weather as follows:

The wind direction was from 030 at 6 knots with prevailing visibility of 9.999 KM or greater and a broken cloud layer with its base at 1500ft above ground level. Temperatures were at 18 degrees, dew point temperatures of 14 degrees, and pressure of 1021 mb.

Weather was not considered a factor in this incident.

1.8. AIDS TO NAVIGATION

Navigation aids available at HKJK were serviceable and had no bearing on the incident.

1.9. COMMUNICATIONS

Not considered a factor.

1.10. AERODROME INFORMATION

1.10.1. General Aerodrome Information – HKJK

HKJK, built in 1978, is located at latitude 01°19'07"S and longitude 36°55'33"E at an elevation of 5,330 ft AMSL. It is an international airport in Nairobi, Kenya, and one of the busiest airports in Eastern Africa. Located in the Embakasi suburb 15KM southeast of Nairobi's central business district, the aerodrome has a manned Air Traffic Control (ATC) and a single runway.

The runway is 4,117 meters long by 45 metres wide with 15 metres of paved shoulders. The runway orientation is 06/24, and the airport operates at category 1 level.

In 2019 (Pre-Covid 19 epidemic), HKJK processed 8.1 million passengers, handled more than 124,000 aircraft movements, and moved almost 351 million tons of cargo. HKJK primarily serves various destinations in Europe, the Middle East, the Far East, all parts of Africa, Indian Ocean Islands, America, and domestic markets.

The runway capacity utilization analysis (actual) and projection is tabulated below. Optimum gross capacity utilization of 100% lies between the years 2024 to 2027 thereabouts on the installed allowed capacity of 157,680 per year.

Table E: SUMMARY OF HKJK RUNWAY 06/24 CAPACITY GAP

Runway 06 /24 Capacity Gap			
Year	Annual Movements	Annual Capacity	Utilization
2007	72,692	157,680	0.5
2015	116,566	157,680	0.7
2020	140,623	157,680	0.9
2030	193,153	157,680	1.2

Source: KAA Chairman Presentation to National Treasury on HKJK investment options 2022

HKJK terminal building demand capacity is forecasted to reach 13.1 million in 2030 and 27.6 million in 2050.

HKJK has a design passenger capacity of 7.5 million, and in 2019, before Covid-19 epidemic annual throughput had reached 8.1 million passengers, with steady annual growth in passengers as demonstrated in the figure below:

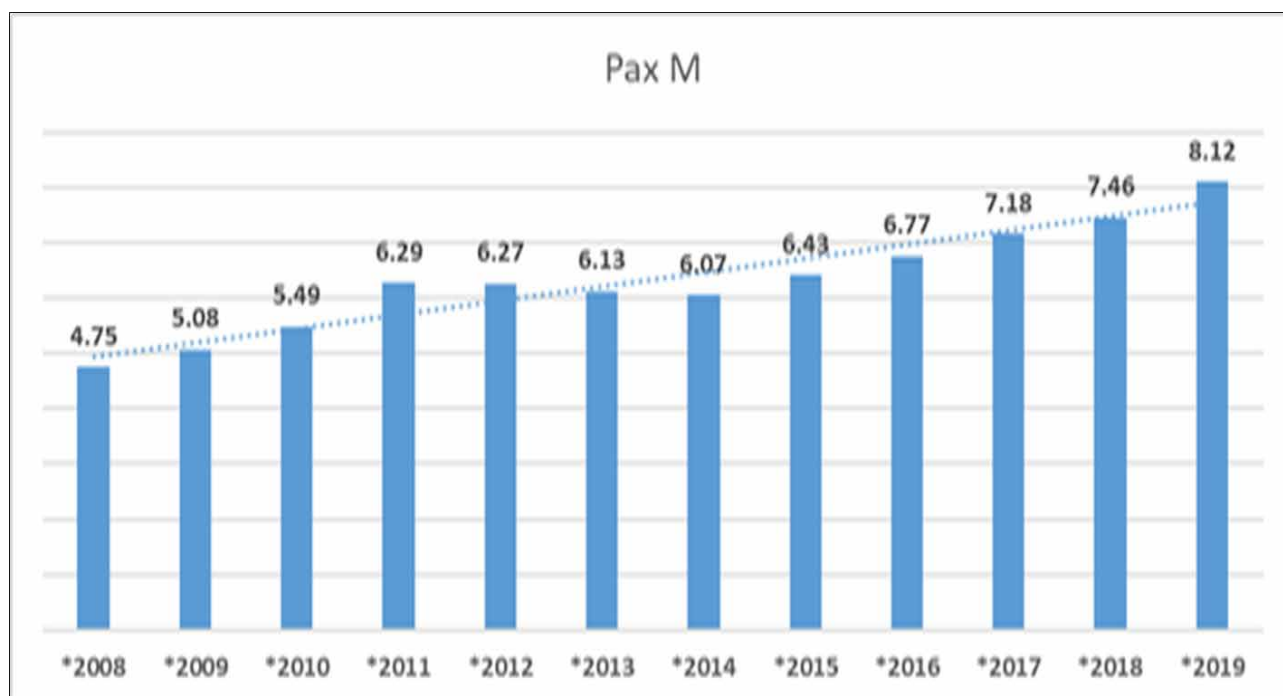


Figure 7: Chart showing Steady Annual Growth in Passengers at HKJK (Source: KAA statistics 2019).

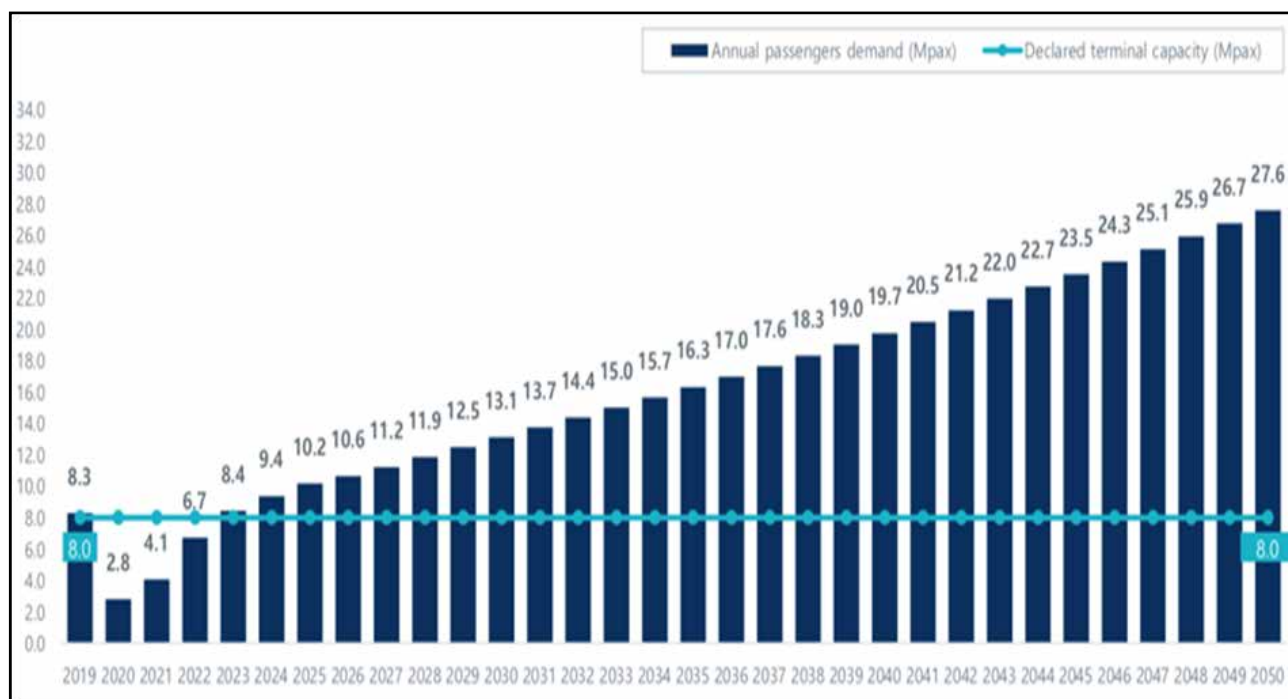
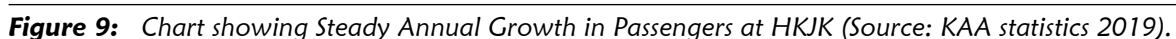


Figure 8: HKJK Annual Passenger Demand vs declared terminal capacity (Source: KAA)



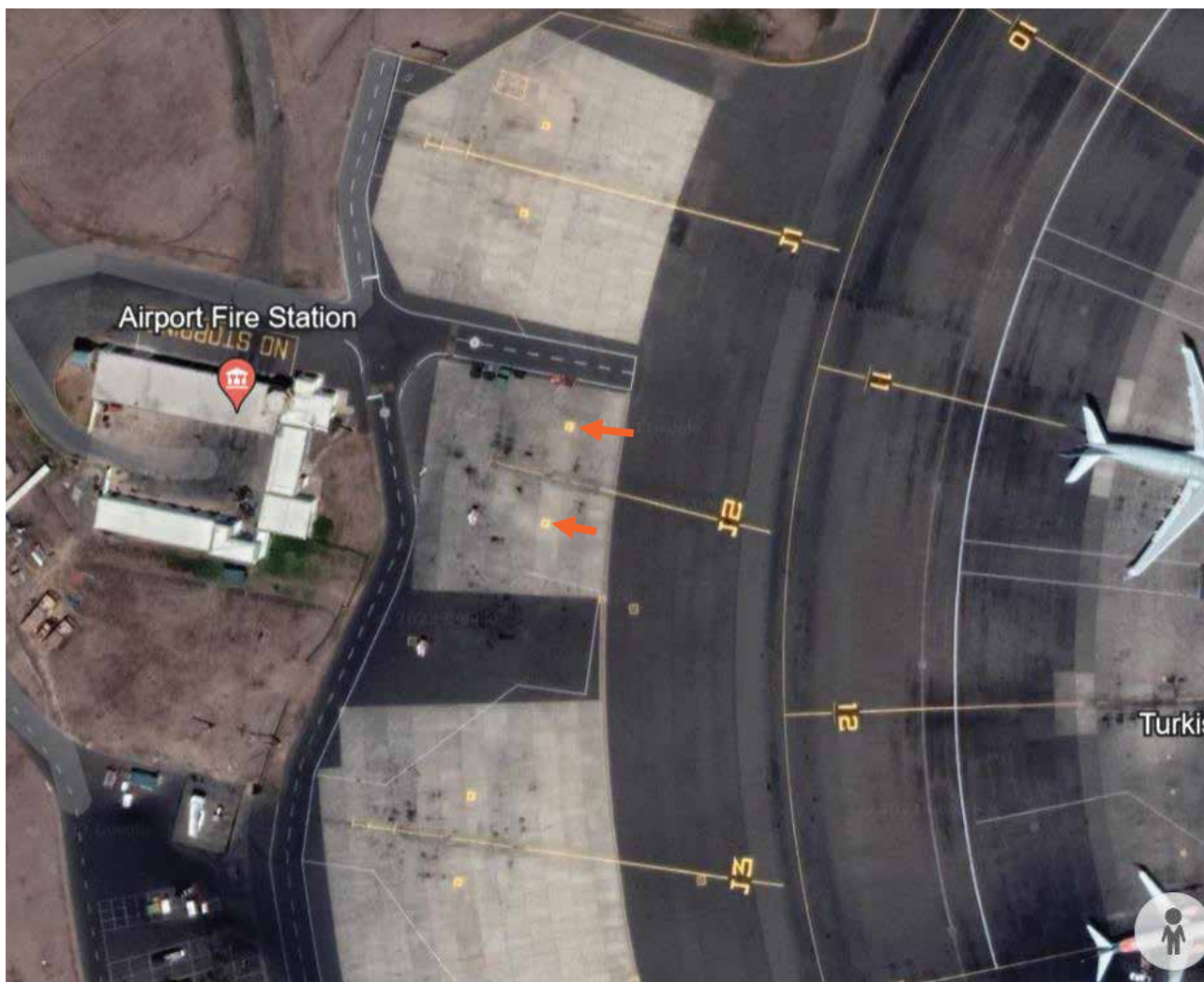


Figure 10: Aerial View of J2 parking Bay and its fuel hydrant pits pointed in colour red, FH52A (the upper one in the picture) and FH52B (source: Google Earth, with AAID annotations).

At the time of the incident, most of the designated aircraft parking bays were occupied.

1.11. FLIGHT RECORDERS

The rear-located Universal Avionics Systems Corporation Cockpit Voice Recorder Flight Data Recorder (CVFDR) Part No. 1605-00-00, Serial No. 471 was downloaded in situ; data was thereafter read out and analyzed.

1.11.1. Cockpit Voice Recorder (CVR)

The CVR recording was faint or overwritten.



Figure 11: A photo depicting the Cockpit Voice Recorder and Flight Data Recorder

1.11.2. Digital Flight Data Recorder (DFDR)

The DFDR data download was successful and was consistent with the phase of flight.

1.12. WRECKAGE AND IMPACT INFORMATION

Apart from the minor damage sustained by the two wing tips, both aircraft remained intact.

1.13. MEDICAL AND PATHOLOGICAL INFORMATION

The crew was not on prescribed drugs. No tests were conducted to check if the crew's performance was affected by fatigue, alcohol, drugs and/or medication at the time of the incident.

Records made available by the aerodrome operator indicated that following the incident, the marshaller underwent an alcohol blood test administered by a Kenya Airways medical doctor. Results from the marshaller's blood alcohol test detected a concentration of 0.012 g/dL (12 mg/dL). These results were not corroborated, nor were they sent to a government physician for further independent clinical interpretation.



1.14. FIRE

There was no pre- or post-incident fire. No fuel leakage was found.

1.15. SURVIVAL ASPECTS

The incident was survivable. All 92 occupants on board survived uninjured and exited the aircraft unaided. The seats and harnesses were all intact and showed no signs of damage.

1.16. TESTS AND RESEARCH

Not applicable.

1.17. ORGANIZATIONAL AND MANAGEMENT INFORMATION

1.17.1. Kenya Airways Plc (KQ)

Aircraft Operator : Kenya Airways Plc.

Address : Nairobi, Kenya

The operator, commonly referred to as KQ, is a premier airline whose principal base of operation is at HKJK in Nairobi, Kenya. It focuses on providing both passenger and cargo air transport services and has a valid AOC issued by KCAA. Its fleet portfolio includes Boeing and Embraer 190 aircraft. The operator also provides ground handling services to other airlines. Kenya Airways offers additional connecting services through alliances with domestic and foreign carriers through code-share agreements. Its operations are spread across Africa, Asia, America, Europe, and the Middle East.

1.17.2. Kenya Airports Authority (KAA)

Aerodrome Operator : Kenya Airports Authority

Address : Nairobi, Kenya

KAA was established by an Act of Parliament in 1992. The KAA Act, Cap 395 (Act No. 3 of 1991, Act No. 8 of 2009, Act No. 18 of 2014), provides for the powers and functions of the Authority. Its head office is on the property of HKJK, Nairobi.

KAA is the owner and operator of HKJK. It is also the owner and operator of Moi International Airport - Mombasa, Eldoret International Airport - Eldoret, Wilson Airport - Nairobi, Kisumu International Airport - Kisumu, Isiolo International Airport - Isiolo, Malindi Airport - Malindi, Wajir Airport - Wajir, Lokichoggio Airport - Lokichoggio, Manda Airport - Manda Island, Ukunda Airport - Diani Beach among others.

At the time of the incident, there was no structured training for the GFS personnel.

1.18. ADDITIONAL INFORMATION

In the recent past, there has been an increase in the number of safety-related incidents at HKJK's taxiways, aprons and parking bays.

1.19. USEFUL AND EFFECTIVE INVESTIGATIVE TECHNIQUES

Not applicable.



2. ANALYSIS

2.1. GENERAL

The weather conditions at the time of the ground collision incident were within the limits for the operations and considered suitable for the flight crew to conduct the flight.

2.1.1. Licensing Aspects

The flight crew was entitled to act as the PIC and first officer of the incident flight with the valid ATP and CP licenses. The crew was properly licensed and suitably qualified to fly the incident aircraft.

2.1.2. Engineering Aspects

The aircraft had a valid Certificate of Airworthiness at the time of the incident, and no anomalies were found in the maintenance history.

The aircraft had no outstanding defects and was serviceable for the incident flight.

2.2. FLIGHT RECORDERS

2.2.1. CVFDR

The FDR data download was successful and was consistent with the phase of flight. The faint/overwritten CVR recording covering the period of the incident prevented some details of the events from being relayed and solved.

2.3. THE AERODROME – HKJK

2.3.1. Parking Bays

At the time of the incident, most of the designated aircraft parking bays were occupied. There is no J2A designated parking bay at HKJK.



2.3.2. CCTV cameras

A still CCTV camera located in one of the aprons recorded footage capturing 5Y-KYT emerging from the right of the screen, taxiing past J2 parking bay and then turning right to park under the guidance of a marshaller. A few seconds later, a taxiing Ethiopian Airlines aircraft emerges from the left of the screen, taxis for about 19 seconds, then stops. 5Y-KYT moves forward again, albeit for a second, then stops as the footage ends. The location of the camera is from the rear of the aircraft. The camera located at the fire station facing the front of the aircraft is a PT2 rotating camera. It did not capture the incident. There is a need to install a still CCTV camera in this location to back up the existing one.

2.3.3. Safety-Related Incidents

In the recent past, there has been an increase in the number of safety-related incidents at HKJK's taxiways, aprons and parking bays. The incidents mainly occur during aircraft pushback, taxiing or parking. This impacts negatively on safety at HKJK, Kenya's premier aviation hub. While the incidents are preventable, all involved parties should play their roles effectively and maintain coordination between all concerned parties at all times.

2.3.4. Aerodrome Capacity

The airport's RWY 06/24, passenger and terminal building capacities are above the initial design capacity.

2.4. ANALYSIS OF THE INCIDENT FLIGHT

2.4.1. Action of the Flight Crew

Records provided by the operator echoed the sentiments of the flight crew that it was assigned bay **J2** by operations control and, on approaching the bay, the ground marshaller guided the aircraft towards abeam bay **J2** as there was another aircraft parked at the bay. The flight crew followed the marshaller's instructions. Approaching the last few feet of marshalling, the aircraft's right-wing tip came into contact with that of the adjacent aircraft and the flight crew stopped the aircraft immediately.

The flight crew thereafter notified the maintenance and operations control of the occurrence and filed an air safety report.



2.4.2. Status of the Flight Crew

There was no evidence that incapacitation or physiological factors affected the flight crew performance.

2.4.3. Action of the Marshaller

The Kenya Airports Authority ground safety officer, while marshalling the aircraft to the allocated space, doubted the wingtip clearance and momentarily stopped the aircraft for assessment and immediately thereafter deemed the space between the two wingtips adequate, continued marshalling the aircraft when its right-wing tip came into contact with the left-wing tip of the parked 5Y-KYQ at a height of 1000 mm above the horizontal axis of both wings. The marshaller immediately signalled the aircraft to stop, and it came to a halt 2 metres short of its intended stop.

2.4.4. Action of the Turnaround Coordinator

The operator's turnaround coordinator (passenger ramp) played a non-descriptive role in the parking of the aircraft.

2.4.5. Wing Walkers

At the time of the incident, no assigned wing walkers were rendering the ground coordination ineffective.

2.4.6. Survivability

The incident was survivable, and no injuries were reported. The ELT was not activated.

2.4.7. Medical

Following the incident, the marshaller underwent an alcohol blood test administered by a Kenya Airways medical doctor. Results from the marshaller's blood alcohol test detected a concentration of 0.012 g/dL (12 mg/dL). These results were not corroborated, nor were they sent to a government physician for further independent clinical interpretation.

The aerodrome operator did not explain why Kenya Airways conducted the test and did not provide standard operating procedures or agreements for drug and alcohol testing of its GFS personnel.



3. CONCLUSION

3.1. FINDINGS, PROBABLE CAUSES AND/OR CONTRIBUTING FACTORS

3.1.1. Findings

The investigation determined the following findings:

- 1) The weather conditions at the time of the accident were within the limits for operations and considered suitable for the crew to conduct the flight.
- 2) The aircraft had a valid Certificate of Airworthiness and was maintained and certified in accordance with the regulatory requirements.
- 3) The aircraft had no outstanding defects and was serviceable for the incident flight.
- 4) The mass and the centre of gravity of the aircraft were within the prescribed limits.
- 5) The flight crew held valid KCAA Class 1 Medical Certificates.
- 6) The flight crew was properly licensed for the flight.
- 7) There was insufficient clearance between the two wing tips leading to the collision.
- 8) At the time of the incident, the operator did not engage the services of a wing walker.
- 9) The ground crew coordination was ineffective.
- 10) The operator's turnaround coordinator (passenger ramp) played a non-descriptive role.
- 11) The faint/overwritten CVR recording covering the period of the incident prevented some details of the events being relayed and solved.
- 12) There was no evidence that incapacitation or physiological factors affected the flight crew performance.
- 13) There is no J2A designated parking bay at HKJK.
- 14) At the time of the incident, most of the designated aircraft parking bays were occupied.
- 15) In the recent past, there has been an increase in the number of safety-related incidents at HKJK's taxiways, aprons and parking bays. There is no J2A designated parking bay at HKJK.

- 16) The airport's runway, passenger and terminal building capacities are above the initial design capacity.

3.1.2. Probable Cause

The probable cause of the ground collision incident was the ground crew's failure to allow sufficient clearance between the two aircraft, resulting in wingtip collision and subsequent minor damage to the two aircraft's wingtips.

3.1.3. Contributing Factors

- 1) Lack of proper coordination between the ground crew.
- 2) Constrained parking space at HKJK due to high number of aircraft movements.
- 3) Absence of wing walker/s.
- 4) Lack of a functional dedicated apron radio frequency.
- 5) Lack of effective Aeronautical Fixed Telecommunications Network (AFTN) coordination procedures between apron control and the tower.

4. SAFETY RECOMMENDATIONS

In light of the investigation findings, the following safety recommendations are made:

4.1. TO KENYA AIRWAYS Plc (KQ)

- 1) Kenya Airways should review, enhance and adhere to its Standard Operating Procedures in addressing the presence and role of wing walkers.

4.2. TO KENYA AIRPORTS AUTHORITY (KAA)

- 1) In order to address the rise of passengers and aircraft movement in the airport over the years, KAA is to factor in building an additional runway parallel to RWY 06/24 and its associated facilities to accommodate more passengers and cargo.
- 2) In order to reduce delays and congestion, KAA is to implement Airport collaborative decision making to include KCAA (ANS), Kenya Airways and all other key stakeholders and hold frequent meetings to address, among others, demand/capacity balancing, slot allocations, aircraft movement, and distribution of arrival times of aircraft.
- 3) KAA to boost the airport's aircraft parking space capacity with at least an additional 55 parking spaces adequate for wide-body aircraft.
- 4) KAA to ensure that the dedicated apron frequency 121.6 MHz is utilized by all involved players to ensure that there is enhanced ground communication between marshallers and flight crew. The communication should be recorded to allow playback.
- 5) KAA to ensure functionality of the Aeronautical Fixed Telecommunications Network (AFTN) coordination procedures between the apron control (121.6 MHz) and the control tower (118.5 MHz) frequencies.
- 6) KAA to enhance security surveillance by increasing the number of still CCTV cameras where there are PT2 ones, e.g., within the fire station area.
- 7) KAA to enhance capacity building and development of its ground safety personnel at the Airport.



4.3. TO THE KENYA CIVIL AVIATION AUTHORITY (KCAA)

- 1) KCAA to enhance surveillance of all involved parties to ensure improved ground communication between marshallers and the flight crew. The communication should be recorded to allow playback.
- 2) KCAA to enhance surveillance of the functionality of the Aeronautical Fixed Telecommunications Network (AFTN) coordination procedures between the apron control (121.6 MHz) and the control tower (118.5 MHz) frequencies.

Ag. Chief Investigator of Aircraft Accidents – KENYA





REPUBLIC OF KENYA



MINISTRY OF ROADS AND TRANSPORT
STATE DEPARTMENT FOR AVIATION
AND AEROSPACE DEVELOPMENT
AIRCRAFT ACCIDENT INVESTIGATION DEPARTMENT

FINAL INVESTIGATION REPORT



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