REPUBLIC OF LIBERIA
Aircraft Accident Investigation Bureau

FINAL REPORT

RAM/2024/17/09

ON SERIOUS INCIDENT INVOLVING ROYAL AIR MAROC (RAM) BOEING 737-800 AIRCRAFT WITH REGISTRATION CN-RGW WHICH OCCURRED AT ROBERTS INTERNATIONAL AIRPORT (GLRB), LIBERIA, ON AUGUST 17, 2024

Published date: December 2025

Preamble

This report was produced by the Liberia Aircraft Accident Investigation Bureau (AAIB)

The report is based upon the investigation carried out by the Liberia Aircraft Accident Investigation Bureau (AAIB), per ICAO Annex 13 to the Convention on International Civil Aviation. The AAIB is responsible for investigating accidents and incidents within Liberia or involving Liberian registered aircraft anywhere in the world. The purpose of aircraft accident / serious incident investigations is not to apportion blame or liability but is designed to determine the causes and contributing factors and make recommendations to prevent future occurrences and improve aviation safety based on findings derived.

Readers are advised that the Liberia Aircraft Accident Investigation Bureau, investigates for the sole purpose of enhancing aviation safety. Consequently, it reports are confined to matters of safety significance and should not be used for any other purpose. The Bureau believes that safety information is of great value if it is passed on for the use of others. Readers are encouraged to copy or reprint for further distribution, acknowledging the Bureau as the source.

Recommendations in this report are addressed to the State through the Minister of Transport. It is for this authority to ensure enforcement.

Printed in Liberia for the Aircraft Accident Investigation Bureau (AAIB)

Contents

TABLE OF FIGURES

GLOSSARY OF ABBREVIATION USED IN THE REPORT

AAIB	Aircraft Accident Investigation Bureau
AGL	Altitude Above Ground Level
AOC	Air Operator Certificate
ATC	Air Traffic Control
AWOS	Automatic Weather Observation Station
CNS	Communications, Navigation, and Surveillance
CVR	Cockpit Voice Recorder
FL	Flight Level
FDR	Flight Data Recorder
FT	Foot (feet)
GLRB	Roberts International Airport
GPWS	Ground Proximity Warning System
H	Hour(s)
ICAO	International Civil Aviation Organization
ILS	Instrument Landing System
IR	Instrument Rating
KM	Kilometer(s)
KT	Knot (s)
LAA	Liberia Airport Authority
LCAA	Liberia Civil Aviation Authority
M	Meter(s)
Min	Minute
MLG	Main Landing Gear
MSA	Minimum Sector Altitude
NOTAM	Notice to Airmen
PAPI	Precision Approach Path Indicator
P1	Captain
P2	First Officer
PIB	Pre-flight Information Bulletin
PF	Pilot Flying

RAM	Royal Air Maroc
RFIR	Roberts Flight Information Region
RWY	Runway
SARPS	Standard and Recommended Practices
SOP	Standard Operating Procedure
UTC	Coordinated Universal Time
VHF	Very High Frequency (30 to 300MHz)
VOR	VHF Omnidirectional Radio Range
Z	Zulu

Report Number:	RAM/2024/17/09
Operator:	Royal Air Maroc
Aircraft type and model:	Boeing 737-800
Manufacturer:	The Boeing Company, USA
Year of manufacture:	2017
Nationality and Registration Mark:	CN-RGW
Serial number:	41350
Location:	Left side of the Runway 04 approximately threshold, Roberts International Airport (GLRB), Liberia.
Date and time:	August 17, 2024, at 05:15 UTC (All times in this report are local time equivalent to (UTC) unless otherwise stated).

OVERVIEW

The Liberia Aircraft Accident Investigation Bureau (AAIB) was notified by the Liberia Civil Aviation Authority (LCAA) personnel at the Roberts International Airport of the occurrence via phone call on August 17, 2024. On 17 August, 2024, Royal Air Maroc flight AT567, a Boeing 737-800, departed Mohamed V International Airport, Casablanca (GMMN) and arrived Roberts International Airport, Monrovia (GLRB) at about 5:15 UTC. The aircraft briefly veered off the left side of the runway during landing on runway 04 at GLRB and returned to the runway and eventually continued to the terminal building.

Investigators were dispatched and arrived at the scene on the same day and commenced post-occurrence assessment under the provisions of ICAO Annex 13 of the International Civil Aviation Organization (ICAO), DOC 9756, and Liberia Aircraft Accident Investigation Regulations 2025. The purpose of this report is to provide details of facts, discussion and findings surrounding the occurrence; it includes information gather from witnesses' statements, harvesting of evidence and comprehensive inspection of the aircraft.

Afterwards it was found that the left-hand rear side of the fuselage had been sprayed with mud and grass, a runway inspection was carried out. A portion of the runway pavement shoulder had been damaged with debris along the runway.

Factors contributing to the serious incident included the Royal Air Maroc dispatcher in Casablanca not including in the Preflight Information Bulletin (PIB) the NOTAM withdrawing all instrument flight procedures at Robert International Airport (GLRB), a lack of clear understanding by the Controller of the request from the crew regarding radar services and ILS serviceability during the approach to runway 04, and the Liberia Airport Authority's (LAA) meteorological reports to the crew did not reflect the actual conditions that the aircraft experienced during the approach, touchdown, and rollout phases of the flight as per the FDR data.

The report contains 7 immediate safety recommendations and 2 safety recommendations. Unless otherwise indicated, recommendations in this report are addressed to the regulatory authorities of the State having responsibility for the matters with which the recommendation is concerned. It is for those authorities to decide what action is taken.

1. FACTUAL INFORMATION

1.1. History of the Flight

On August 17, 2024, Royal Air Maroc flight AT567, departed Mohammed V International Airport (GMMN) in Casablanca at 00:54 UTC for Roberts International Airport (GLRB) in Monrovia. The flight had 70 passengers on board with 6 crew members. The Captain was the Pilot Flying (PF) while the First Officer was the Pilot Monitoring (PM).

Royal Air Maroc 567 deviated left of track for 140 NM from way point MOPAL due to weather. After the deviation RAM 567 was cleared by BAMAKO ACC to waypoint Ponka.

At 04:28.03 UTC, RAM 567 contacted Bamako Area ATC and reported flight level 380 and requested to proceed to RNAV waypoint BOAKA for runway 22. Bamako Duty Air Traffic Controller responded and advised RAM 567 to "continue straight ahead" for runway 22 and to contact Roberts Area CONTROLLER on 128.1.

At 04:28.50 UTC, RAM 567 contacted Roberts Area CONTROLLER and the CONTROLLER responded, "FIVE SIX SEVEN GOOD MORNING TIME ZERO FOUR TWO NINE FLYING INBOUND ROBERTS AS PLANNED ROUTE FLIGHT LEVEL THREE EIGHT ZERO REPORT ESTIMATE NANAN CORRECTION REPORT ESTIMATE PONKA REPORT ETA ROBERTS." RAM 567 responded, "WE ESTIMATE ERH PONKA AT ZERO FOUR FIVE FOUR AND LANDING AT ZERO FIVE ONE FOUR ROYAL MAROC FIVE SIX SEVEN AND MAY WE PROCEED TO BOAKA FOR RUNWAY TWO TWO TO POSITION ROYAL MAROC FIVE SIX SEVEN." Roberts Area CONTROLLER then advised RAM 567 to proceed direct BOAKA and estimate BOAKA. RAM 567 estimated BOAKA at 05:09 UTC and the Roberts Area CONTROLLER advised them to report when ready for descent.

At 04:30:25 UTC, RAM 567 contacted Roberts Area CONTROLLER and requested the current weather. At 04:34:13 UTC, Roberts Area CONTROLLER responded, "ROBERTS WEATHER TIME ZERO FOUR THREE ZERO ZULU WIND IS CALM VISIBILITY ONE ZERO KILOMETERS BROKEN CLOUDS ONE THOUSAND TWO HUNDRED FEET FEW CB DIRECTION SOUTHWEST AT TWO THREE ZERO ZERO FEET TEMPERTAURE TWO FOUR DEW POINT TWO THREE (QNH) ONE ZERO ONE THREE RUNWAY ZERO FOUR REPORT READY FOR DESCENT." At this point, Roberts Area CONTROLLER switched from runway 22 to runway 04. RAM 567's crew immediately begin to have a conversation in French and/or Arabic, where they discussed the arrival weather and the MSA of 3100 feet as follows "F/O: Wind is calmCapt: That's the weather of 0200, Broken 1200, the MSA 3100F/O: We have MSA …..MSA 3100Capt: 3100Capt :Look, it was 143 and now it's 141.(RAM DQSS Interpretation : meaning perhaps VREF)F/O: I don't know if they will inform the crew, they will wake them up early. F/O: We take .... Capt: 04 F/O: 04".

At 04:48:49 UTC, RAM 567 contacted Roberts Area CONTROLLER and requested descent. At 04:49:08 UTC Roberts Area CONTROLLER responded, "MAROC FIVE SIX SEVEN DESCEND TO FLIGHT LEVEL ONE ZERO ZERO REPORT PASSING ONE FOUR ZERO." At 05:01:54 UTC RAM 567 contacted Roberts Area CONTROLLER to report approaching flight level 140. Roberts Area CONTROLLER responded, "CONTACT APPROACH ONE TWO FOUR DECIMAL FIVE SAFE LANDING."

At 05:02:13 UTC, RAM 567 contacted Roberts Approach CONTROLLER, "ROBERTS APPROACH GOOD MORNING ROYAL MAROC FIVE SIX SEVEN FLIGHT LEVEL ONE FOUR ZERO DESCENDING ONE HUNDRED TO BOAKA." Roberts Approach CONTROLLER responded at

05:02:25 UTC, "AIR MAROC SIX SEVEN CLEARED VIA BOAKA ARRIVAL TO EXPECT RNAV APPROACH RUNWAY TWO TWO CONTINUE DESCENT TO THREE THOUSAND ONE HUNDRED FEET BRAVOS (QNH) ONE ZERO ONE THREE REPORT POSITION BOAKA." RAM 567 responded, "ROYAL MAROC FIVE SIX SEVEN WE NOTICE BY THE CONTROL RUNWAY ZERO FOUR IN USE WE PROCEED TO RUNWAY ZERO FOUR ROYAL MAROC FIVE SIX SEVEN." At this stage, Roberts Approach CONTROLLER is clearing the aircraft for an RNAV approach to runway 22, however, the crew responds that they have been cleared to runway 04 by the previous Roberts Area CONTROLLER and so they request runway 04.

At 05:02:51 UTC, Roberts Approach CONTROLLER responds to RAM 567, "MAROC PASSSING SEVEN ERH CLEARED RUNWAY ZERO FOUR VIA "R R C H Y" FOR ILS RUNWAY ZERO FOUR CONTINUE DESCENT FOUR THOUSAND FEET FOUR THOUSAND FEET ON (QNH) ONE ZERO ONE THREE REPORT RRCHY." Roberts Approach CONTROLLER clears the aircraft for an ILS approach for runway 04 via RNAV waypoint RRCHY. At 05:03:11 UTC, RAM 567 responds, "WE CONTINUE FOUR THOUSAND FEET ON (QNH) ONE ZERO ONE THREE AND ERH WE PROCEED ERH FOR POSITION CONFIRM TO WHICH POINT." Roberts Approach CONTROLLER then responds by spelling out the RNAV waypoint for clarity, "ROMEO ROMEO CHARLIE HOTEL YANKEE." RAM 567 confirms the copy and repeats the RNAV waypoint.

At 05:04:54 UTC, RAM 567 contacted Roberts Approach CONTROLLER requesting an abbreviated approach to line up with the ILS for runway 04, "ROYAL MOROC FIVE SIX SEVEN MAY WE PROCEED TO FINAL LEFT TURN TEN MILES BEFORE R R C H Y?" Roberts Approach CONTROLLER responds at 05:05:01 UTC, "** SAY AGAIN." RAM 567 repeats the request and Roberts Approach CONTROLLER responds at 05:05:10 UTC, "ARH ROGER." Roberts Approach CONTROLLER then asks RAM 567 for their flight level passing and they report it to be flight level 100.

At 05:05:19 UTC, Roberts Approach CONTROLLER contacts RAM 567, "** CONTINUE DESCENT THREE THOUSAND FEET ON QNH ONE ZERO ONE THREE AND CLEARED TEN MILES FINAL APPROACH RUNWAY ZERO FOUR REPORT ESTABLISHED INBOUND." RAM 567 responds at 05:05:31 UTC, "DESCEND THREE THOUSAND FEET QNH ONE ZERO ONE THREE CLEARED ILS ZERO FOUR AND CALL ESTABLISHED AND PLEASE CONFIRM RADAR CONTACT FOR ROYAL MAROC FIVE SIX SEVEN." Roberts Approach CONTROLLER does not respond and RAM 567 calls again at 05:05:48 UTC, "ROBERTS ROYAL MAROC FIVE SIX SEVEN DO YOU HAVE RADAR CONTACT?" Roberts Approach CONTROLLER responds at 05:05:54 UTC, "ARH SAY AGAIN." RAM 567 responds at 05:05:56 UTC, "DO YOU HAVE RADAR CONTACT ROYAL MAROC FIVE SIX SEVEN?" Roberts Approach CONTROLLER responds at 05:05:59 UTC, "NO, LIGHT RAIN BUT IT HAS STOPPED." RAM 567 then responds as follows, "ARH, WE WILL CALL YOU ON FINAL ZERO FOUR ROYAL MAROC FIVE SIX SEVEN."

At 05:06:11 UTC, RAM 567 Captain then takes over communications and contacts Roberts Approach CONTROLLER, "PLEASE WE ARE ASKING YOU OF RADAR CONTACT DO YOU HAVE RADAR CONTACT?" Roberts Approach CONTROLLER responds at 05:06:21 UTC, "I DONT HAVE CONTACT WITH WHOEVER AIRCRAFT." RAM 567's Captain continues communication and at 05:06:25UTC, he calls Roberts Approach CONTROLLER again, "DO YOU HAVE CONTACT CONFIRM POSITIVE CONTACT?" Roberts Approach CONTROLLER responds, "CONTACT WITH ROBERT CONTROL?" RAM 567's First Officer then takes back communications and responds at 05:06:34 UTC, "DISREGARD FIVE SIX SEVEN WILL CALL YOU ON FINAL RUNWAY ZERO FOUR." Subsequent to this exchange, the crew then begins to speak again in French

and/or Arabic for approximately one minute where they discuss MSA and the availability of Radar as follows, “F/O: 3000 here Capt: he gave us 3000 F/O: we are in MSA, that's fine, we wait a little bit here and we descend to 1500 in the takeoff corridor Capt Put RRCHY in FIX and put minus and we put LNAV F/O: Minus, how much? Capt: - 10 NM F/O: - 10 Capt: you put RRCHY in FIX? F/O: Here is it Capt: in FIX?? F/O: No not yet F/O: ok, here is it Capt: There is nothing, radar returns are not loaded F/O: I give you the RUNWAY AXE. Capt: Tell him we request radar vectoring and wait his answer. So he will understand”.

At 05:07:47 UTC, RAM 567 contacts Roberts Approach CONTROLLER again regarding radar vectoring, “AND ERH ROYAL MAROC FIVE SIX SEVEN REQUEST RADAR VECTORING.” Roberts Approach CONTROLLER responds, “CONFIRM REQUESTING FURTHER DESCENT.” RAM 567 responds, “REQUEST RADAR VECTORING RADAR VECTORING ROYAL MAROC FIVE SIX SEVEN.”

At 05:08:11 UTC, RAM 567 contacted Roberts Approach CONTROLLER, “WILL CALL YOU ON FINAL ZERO FOUR ROYAL MAROC FIVE SIX SEVEN.” Roberts Approach CONTROLLER responds, “CAN I READ THE ZERO FIVE ZERO ZERO WEATHER?” And at 05:08:24 UTC RAM 567 answers, “NEGATIVE WILL CALL YOU ON FINAL ROYAL MAROC FIVE SIX SEVEN AND GO AHEAD FOR WEATHER.” Immediately after this exchange, the crew of RAM 567 has another one-minute conversation in French and/or Arabic as follows: “Capt: we don't have to turn yet. F/O: 042 -. Capt: Not yet for turn, 10 miles and half. F/O: Not yet. Capt: this one at 1500 a bit more. F/O: Yes 1500. Capt: we put +2 radar +2.

At 05:09:33 UTC, Roberts Approach CONTROLLER contacts RAM 567, “AIR MAROC FIVE SIX SEVEN BE ADVISED CURRENT VISIBILITY SIX KILOMETERS IN LIGHT RAIN.” To which RAM 567 acknowledges.

At 05:12:20 UTC, RAM 567 contacts Roberts Approach CONTROLLER regarding ILS, “ROYAL MAROC FIVE SIX SEVEN CONFIRM ILS SERVICEABLE RUNWAY ZERO FOUR.” Roberts Approach CONTROLLER responds, “ACCORDING TO TECHNICIAN REPORT.” RAM 567 then responds, “WE HAVE NO ILS SIGNAL ROYAL MAROC FIVE SIX SEVEN.” Roberts Approach CONTROLLER then refers RAM 567 back to RNAV waypoint, “FIVE SIX SEVEN REPORT D U C O R FOR RNAV RUNWAY ZERO FOUR.” To which RAM 567 responded, “I WILL CALL YOU BACK.” The RAM 567 crew begin to have a conversation in French and/or Arabic while going through their check list as follows “Capt: what did he say? F/O: we do it in LNAV and Vertical Speed? Capt: perhaps It’s too late. F/O: No still have time, it’s ok. Capt: here is it. F/O: Ok”.

At 05:14:00 UTC, RAM 567 contacts Roberts Approach CONTROLLER, “SHORT FINAL SHORT FINAL SHORT FINAL ROYAL MAROC FIVE SIX SEVEN.” Roberts Approach CONTROLLER responds, “AIR MAROC CONFIRM YOU HAVE THE RUNWAY IN SIGHT.” To which RAM 567 confirms that they have the runway in sight. Roberts Approach CONTROLLER then gives them the wind and clears them to land at 05:14:11UTC, “RAM FIVE SIX SEVEN WIND TWO THREE ZERO DEGREES AT ZERO SIX KNOTS CLEARED TO LAND RUNWAY ZERO FOUR CLEARED TO LAND.”

The autopilot disengages at 05:14:21 UTC, and the crew of RAM 567 goes through their landing checklist. The sink rate warning goes off and at 05:15:04 UTC, The Captain of RAM 567 calls for wipers, “VISIBILITY WIPERS WIPERS WIPERS,” and the First Officer responds, “WIPERS MAXIMUM” to which the Captain again asks twice, “IS IT THE MAXIMUM?” and the First Officer responds, “WIPERS IT IS THE MAXIMUM.”

At this stage, RAM 567 touches down and the Captain informed the investigators during the interview that there was a sudden gush of heavy rain that completely blinded them during landing rollout and caused them to lose situational awareness momentarily. During the gush of sudden rain shower after touch down to the left of the centerline on runway 04, the aircraft veered off to the left side of the runway where two of the tires of the left main landing gears left the runway at L14 parallel to the runway and then returned to the runway at around L17. The aircraft then continued taxing to the end of the runway and exited via Taxiway A to the terminal and disembarked the passengers without injuries or fatalities. One of the ground crew called the RAM 567 crew and asked them to send the engineer down to observe the debris that had accumulated on the left main landing gear and left engine.

Figure 1. Taxi and Departure of RAM567 from GMMN to GLRB

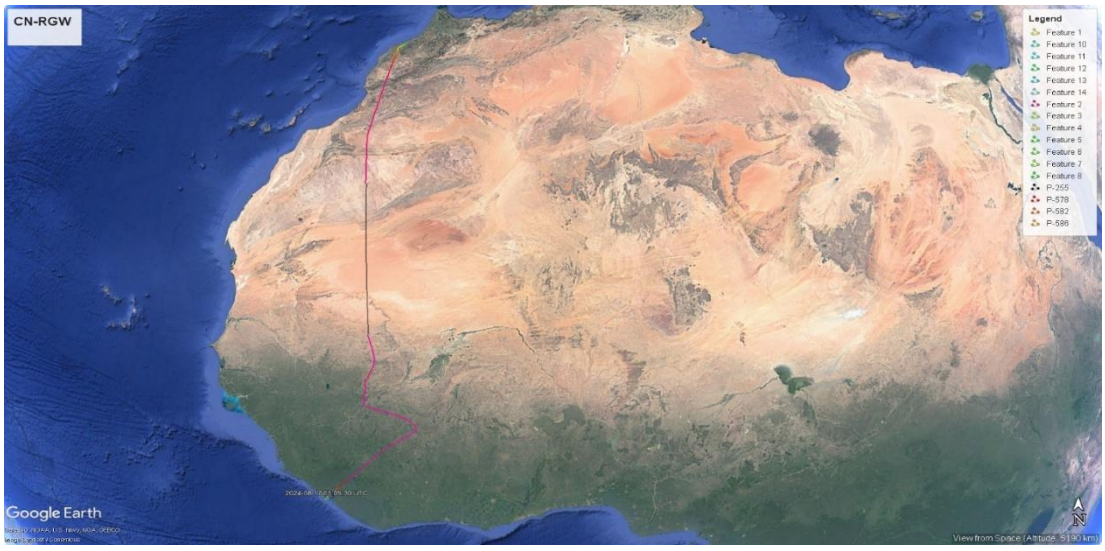


Figure 2. Entire flight route of RAM567

1.2. Injuries to persons

Injuries	Crew	Passengers	Total in the aircraft	Others
Fatal	**NIL**	**NIL**	**NIL**	**NIL**
Serious	**NIL**	**NIL**	**NIL**	**NIL**
Minor	**NIL**	**NIL**	**NIL**	**NIL**
None	**6**	**70**	**76**	**NIL**
Total	**6**	**70**	**76**	**NIL**

1.3. Damage to Aircraft

The aircraft was slightly damaged. Damage on parts of the fuselage and other components of the aircraft as detailed in the report.

1.4. Other Damage

Two broken runway edge lights (L13, L21) and chipping to the runway edges. Two runway lights were broken as a result of the excursion. Clear tire marks were observed leaving the runway and creating a rut in the ground adjacent to the runway before returning to the runway.

Figure 3. Damaged runway edge light L13

Figure 4. Tire rut along the runway

1.5. Personnel Information

1.5.1.1. Captain

Nationality:	Moroccan
Age:	57 years
License type:	ATPL, Valid till September 30, 2024
Aircraft ratings:	B737-700/800/900
Medical Certificate:	Valid till September 30, 2024
Simulator:	Valid till September 30, 2024
Instrument rating:	Valid till September 30, 2024
Total flying time:	17,892 HR
Total on type:	15,458 HR
Last 90 days:	463 HR
Last 28 days:	109 HR
Last 2 hours:	NIL

1.5.1.2. First Officer

Nationality:	Moroccan
Age:	34 years
License type:	CPL1134, valid till May 31, 2025
Aircraft rating:	B-737/700/800/900
Medical certificate:	Valid till October 31, 2024
Simulator**:**	Valid till November 30, 2024
Instrument rating:	Valid till May 31, 2025
Total flying time:	2735 HR.
Total on type:	1154 HR.
Last 90 days:	214 HR.
Last 28 days:	82 HR.
Last 24 hours:	NIL

1.5.1.3. RFIR Air Traffic Controller

Nationality:	Liberian
Age:	46 years
License Type:	Area Control

Date of medical examination:	March 21, 2022
Medical certificate:	Valid till March 20, 2024
Aeromedical Assessment:	FIT FOR ATCO
Limitation:	None

1.5.1.4. RFIR Air Traffic Controller

Nationality:	Guinean
Age:	35 years
License Type:	Area Control
Date of medical examination:	December 08, 2022
Medical certificate:	Valid till December 07, 2026
Aeromedical Assessment:	FIT FOR ATCO
Limitation:	None

1.5.1.5. LCAA Air Traffic Controller

Nationality:	Liberian
Age:	52 years
License Type:	Approach Control
Medical certificate:	Valid till August 13, 2024

1.6. Aircraft Information

1.6.1.1. General Information

Type:	737- 8SM Series
Manufacturer:	The Boeing Company, USA
Date of Manufacture:	2017
Serial no:	41350
Registered Operator:	Royal Air Maroc
Registration number:	CN-RGW
AOC Number:	CN-XRC01/96
Certificate of Airworthiness:	Issued November 30, 2023
Certificate of Insurance:	Valid till December 1, 2024
Certificate of Registration:	Issued December 30, 2023
Radio Station Authorization:	Valid till February 20, 2023
Total Air Frame time:	16965 HR.

Total Cycle since new (CNS): 7345 HR.

1.6.1.2. Engines

Manufacturer	CFM International	CFM International
Type/Model	CFM 56-7BE	CFM 56- 7BE
Year of Manufacturer	December 12, 2016	November 12, 2016
Serial number	864841	864846
Time Since New	14093	14093
Cycles Since New	5976	5976

Fuel Used: Jet A1.

1.7. Meteorological Information

The following are the meteorological Reports for Roberts International Airport provided by the meteorological department of the Liberia Airport Authority (LAA) for August 17, 2024.

Time	0430Z	0500Z	0530Z
Wind	0000(Calm)	230.06kt	250.05kt
Visibility	10km	6km (60RA, rain drizzle)	6km (60RA, rain drizzle)
Cloud	Broken (BKN)1200ft	FEW BKN 500ft BKN 1200ft	FEW BKN 500ft BKN1200ft
Broken cloud	FEW CB 2300 ft	FEW BKN CB 2300FT	FEW BKN CB 2300FT
Temperature/Dew point	24°C/23°C	24°C /23°C	24°C /23°C
QNH	1013.0HPa	1013.1HPA	1013.3HPa
CB Direction	SW	SE/SW	SE/SW
TREND	NOSIG	NOSIG	NOSIG
Relative Humidity	96%	96%	96%

1.8. Aids to Navigation

The Status of the navigational aids at Roberts International Airport at 16:00 UTC on August 16, 2024 was as follows:

VHF	113.8 MHz	(ROB----VOR/DME)	Serviceable
VHF	110.3 MHz	(ILS/DME/IDENT SK)	Serviceable

1.9. Communication

The status of the communication equipment at Roberts International Airport on the day of the occurrence was as follows:

VHF	128.1MHz	Roberts Area Control	-	Serviceable
VHF	124.5MHz	Roberts Approach	-	Serviceable
VHF	118.3MHz	Roberts Tower	-	Serviceable
VHF	121.9MHz	Roberts Ground	-	Serviceable

During the communications between the Roberts Approach Controller and the flight crew, there were multiple instances of confusion as to what was being communicated between them. The crew asked for radar information on 5 separate occasions and the Controller did not comprehend the request.

1.10. Aerodrome Information

Roberts International Airport is the only international airport in Liberia and is managed by the Liberia Airport Authority (LAA). The Liberia Airport Authority is responsible for providing equipment, infrastructure and maintenance to the Air Traffic services while the Air Traffic Controllers are employees of the Liberia Civil Aviation Authority (LCAA). The Roberts Flight Information Region (RFIR) also has Area controllers that control the upper airspace from 10,000 ft and above. The airport is located in Margibi County and the airport has an Aerodrome Reference Point (ARP) of W 010° 21' 44.18" / N 06°14' 01.64" with an elevation of 31ft/9.45m above sea level. Located near the town of Harbel in Margibi County, the single runway airport is about 35 miles (56km) east of the nation's capital of Monrovia, and as an origin and destination point is referred to as "Monrovia." The airport has one bi-directional runway: 04/22. The ICAO airport code of this airport is GLRB. The airports IATA code is ROB. It is within the Roberts Flight Information Region (RFIR). Runway 04 which is 11,000 ft X150 ft, has an instrument Landing System (ILS) with frequency VHF 110.3 MHz with centerline edge threshold high intensity CAT I lighting system. Runway 04/22 is equipped with PAPIs. A VOR/DME is located at GLRB with frequency VHF 113.8 MHz

1.11. Flight Recorders

The aircraft was fitted with a Cockpit Voice Recorder (CVR) and a Flight Data Recorder (FDR), with the following particulars:

	Cockpit Voice Recorder
Model	Solid State
Part Number	980-6032-003
Serial Number	CVR-05381
Manufacturer	Honeywell
Channels	Four (4)

	Flight Data Recorder
Model	Solid State
Part Number	980-4750-009
Serial Number	FDR-01152
Manufacturer	Honeywell

The recorders were retrieved at Roberts International Airport by Liberia's AAIB investigators and hand-carried to the BEA facilities in Rabat, Morocco. The data was downloaded on 7 October 2024. The raw data, in DLU format was uploaded to a secure portal and made available to the Nigerian Safety Investigation Bureau (NSIB) for further analysis.
In addition, the Royal Air Maroc had earlier availed the investigations contents of the Quick Access Recorder (QAR) in a spreadsheet format.
Additional FDR and CVR analysis, including flight path analysis, FDR analysis, CVR transcription and simulation of the flight, were conducted at the Transportation Safety Laboratory of the Nigerian Safety Investigation Bureau (NSIB), Abuja.

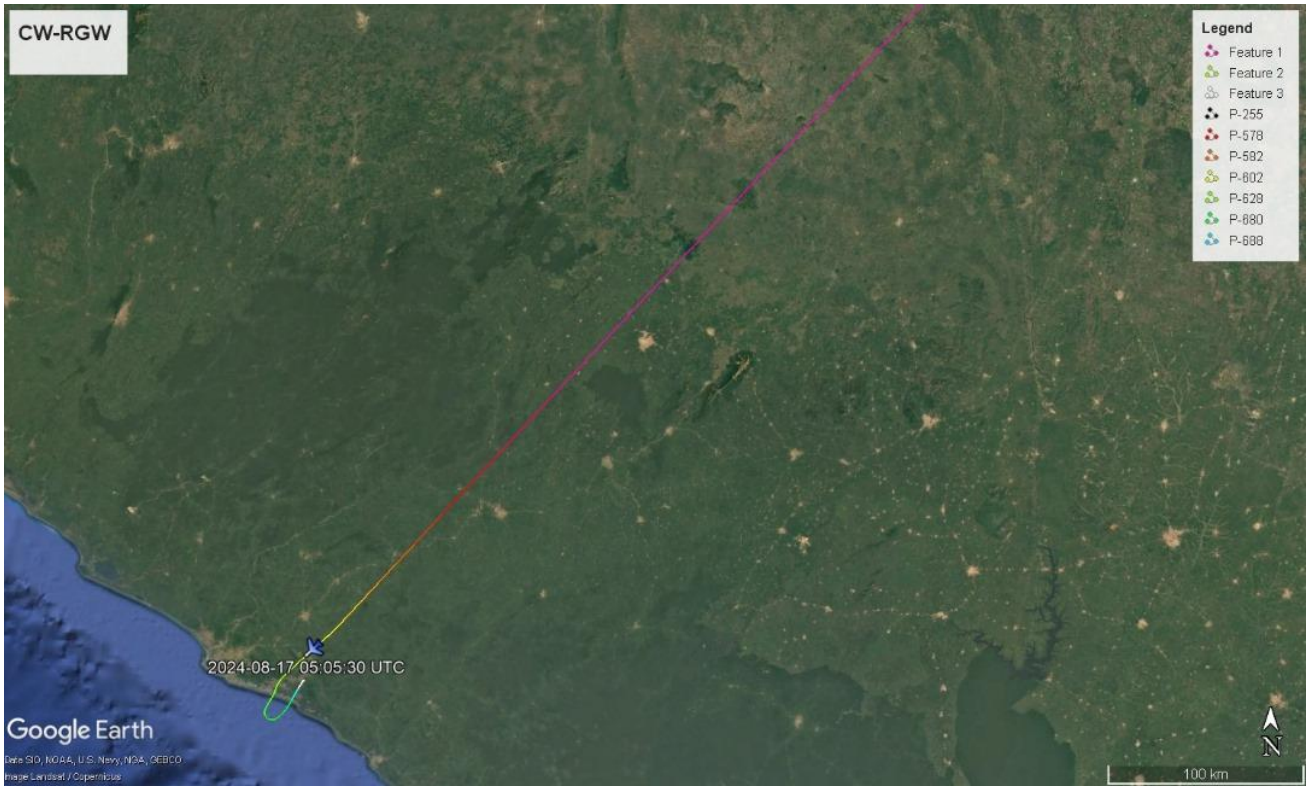


Figure 5. RAM 567 RNAV descent and approach route to GLRB

Figure 6. RAM 567 RNAV approach route to RWY 04 at GLRB

Figure 7. RAM 567 crossing the threshold to the left of the centerline

Figure 8. RAM 567 FDR Wind direction and speed upon touchdown

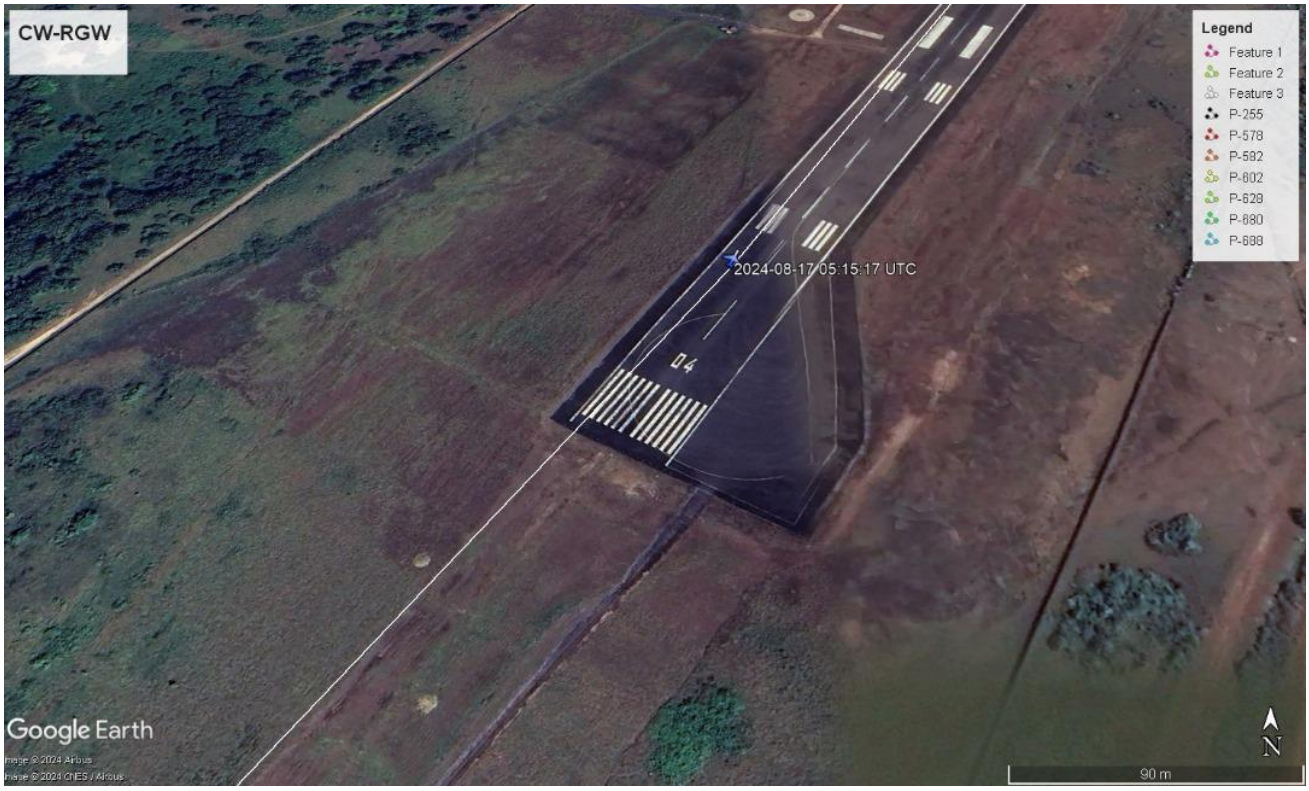


Figure 9. RAM 567 FDR Profile Landing on left of centerline Runway 04 GLRB

1.12. Wreckage and Impact Information

The aircraft touched down on the left side of the Centre line on Runway 22 within the touchdown zone. On landing rollout, the aircraft veered further left until the left main landing gear moved off the runway and entered into the grass and travelled from L14 parallel to the runway and then returned to the runway at around L17. There were six dents on the left-hand fuselage skin between station 787F to 7871, the lavatory service panel cover was missing, the dents on the left hand horizontal stabilizer leading edge skin, and dent with a crack on the left-hand wing inboard AFT flap lower skin.

Figure 10. Damage to left side fuselage skin

Figure11. Debris on left main landing gear strut

Figure 12. Speed tape on the dent mark of the left-hand horizontal stabilizer leading edge skin

Figure 13. Crack to left hand wing inboard aft flap lower skin covered by speed tape

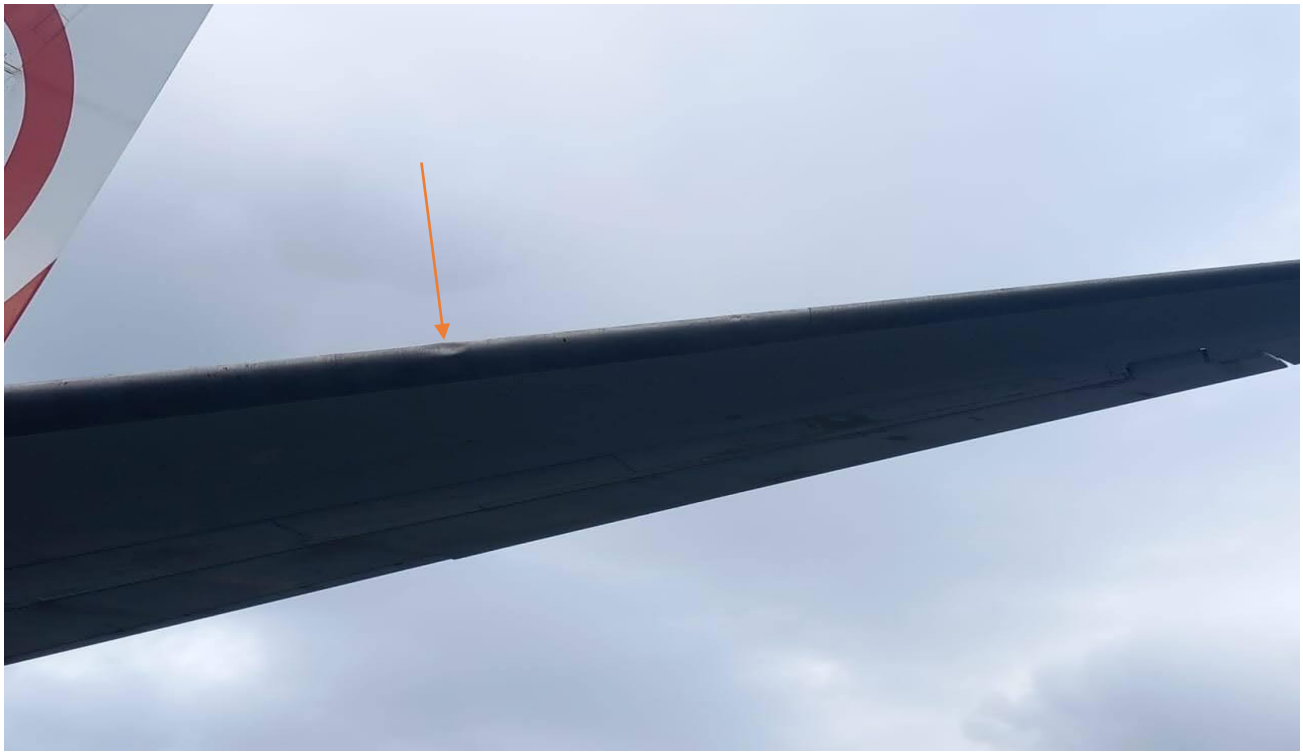


Figure 14. Dent created on the left-hand horizontal stabilizer leading edge skin

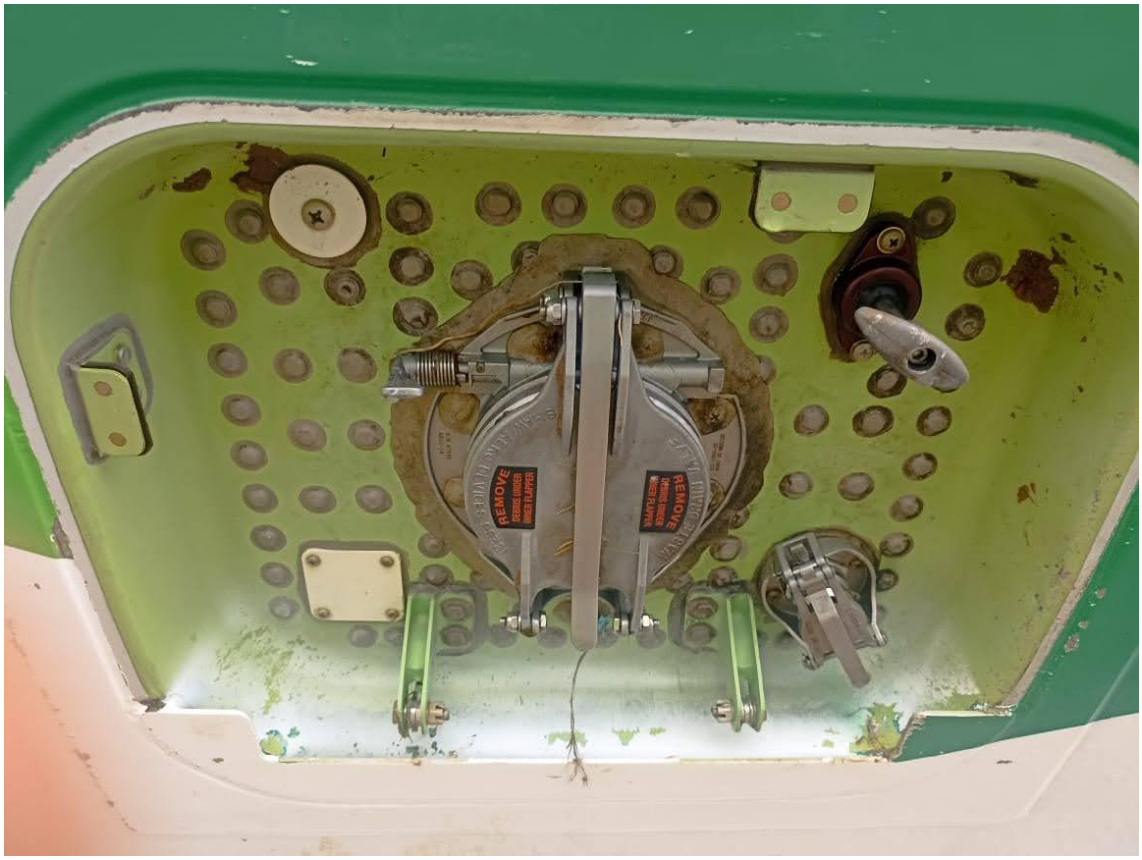


Figure 15. Lavatory service panel without cover

Figure 16. Dent with crack to the AFT flap lower skin

1.13. Medical and Pathological Information

Toxicological tests were not conducted on the crew.

1.14. Fire

There was no fire outbreak.

1.15. Survival aspect

The occurrence was survivable in that the passenger restraint system (seat belts and shoulder harnesses) were intact and there was livable volume for the occupants.

1.16. Test and Research

N/A

1.17. Organizational and Management Information

1.17.1.1. Royal Air Maroc

Royal Air Maroc-Compagnie Nationale de Transports Aériens, more commonly known as simply RAM, was formed in July 1953 and is the Moroccan national carrier, as well as the country's largest airline. Royal Air Maroc-Compagnie Nationale de Transports Aéiens was formed as a result of the merger of Compagnie Chérifienne de'l Air (Air Atlas) and Compagnie Chérifienne de Transports Aériens Air Maroc. The name Royal Air Maroc was adopted on 28 June 1957, with the government of Morocco having a 67.73% stake. Currently RAM is fully owned by the government of Morocco, and has its headquarters on the grounds of Casablanca-Anfa Airport. From its base at Mohammed V International Airport, the carrier operates a domestic network in Morocco, scheduled international flights to Africa, Asia, Europe, and North and South America, and occasional charter flights that include Hajj services. Royal Air Maroc is responsible for the commercial operation, maintenance coordination, crew management, and overall operational control of the aircraft. It has a fleet of Boeing 737-800 with 28 aircraft, ATR72-600 with 6 aircraft, Boeing 767-300 Cargo with 1 aircraft, Embraer 190 with 4 aircraft, Boeing 787-8 Dreamliner with 5 aircraft, Boeing 737 MAX 8 with 10 aircrafts.

1.17.1.2. Liberia Civil Aviation Authority (LCAA)

Liberia Civil Aviation Authority (LCAA) was established by an Act of the Liberian Legislature in 2005 and amended in 2019 as an independent regulatory body. It provides enhanced quality in service and productivity by providing innovative technical regulatory supervision geared towards the promotion of a safe civil aviation sector. It also places high-value in fostering teamwork, training and continuous improvement in the level of professionalism commensurate with ICAO’s standards. The LCAA exercises oversight over aviation safety, security, air navigation services, airport operations, and compliance with national and international aviation regulations. It functions as the primary body influencing the operational environment in which aircraft operates within Liberian airspace. LCAA is responsible for certification of airports and surveillance of airlines and operators. Additionally, it carries out inspection and audit of aviation service providers, enforcement of aviation safety regulations, oversight of Air Operator Certificates (AOC) and monitoring compliance with ICAO SARPs. The vision of the Liberia Civil Aviation Authority is to become a world-class leader in the regulation and promotion of aviation by fostering its safe and orderly development in Liberia in line with International Standards.

1.17.1.3. Liberia Airport Authority (LAA)

The Liberia Airport Authority was established by an Act of the Liberian Legislature in 2009. The Liberia Airport Authority is responsible for the supervision and management of all airports and their facilities in Liberia (international and domestic); Rescue and Firefighting services, Meteorology and Security (especially baggage and passenger screening) as per ICAO.

1.17.1.4. Robert Flight Information Region (RFIR)

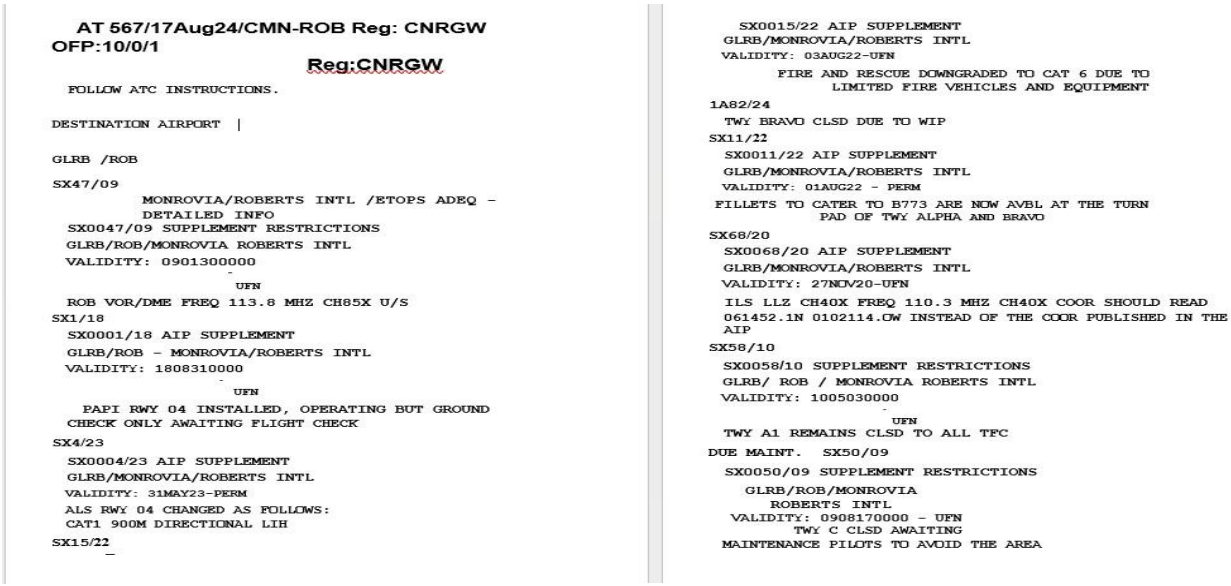
The Roberts Flight Information Region (RFIR) was established on January 17, 1975, when Guinea Conakry, Liberia, and Sierra Leone, set up an aeronautical cooperative venture to provide air navigation services for en-route flights (above 3,000 feet AGL) in their combined airspace. Member states continued to manage the lower airspace within their territorial boundaries from ground to 3000 ft. The headquarters of the RFIR is located in Robertsfield, Margibi County, Liberia.
As a sign of progress made through years of cooperation, the responsibility for providing Approach Control Service was revised to 10,000 feet AGL. With support from member governments, they have

made enormous strides to become a fully autonomous entity, which now contributes heavily to the development of civil aviation in the region.

RFIR is governed by three bodies. The Ministerial Council, the highest decision-making body consists of the Ministers in charge of Civil Aviation in the three States. The Technical Committee, the technical board of RFIR consists of the Director Generals of Civil Aviation Authorities of the three States. The Secretariat consists of the Executive Management headed by a Secretary General, assisted by technical staff including air traffic controllers of the Roberts FIR.

1.18. Additional Information

Royal Air Maroc (RAM) dispatch at Mohammed V International Airport (GMMN) did not include the NOTAM of June 14, 2022, that suspended all instrument flight procedures approaches at Roberts International Airport (GLRB) in the Preflight Information Bulletin (PIB).



AT 567/17Aug24/CMN-ROB Reg: CNRGW
OFP:10/0/1
Reg:CNRGW
FOLLOW ATC INSTRUCTIONS.

DESTINATION AIRPORT |

GLRB /ROB

SX47/09
MONROVIA/ROBERTS INTL /ETOPS ADEQ -
DETAILED INFO
SX0047/09 SUPPLEMENT RESTRICTIONS
GLRB/ROB/MONROVIA ROBERTS INTL
VALIDITY: 0901300000
UFN
ROB VOR/DME FREQ 113.8 MHZ CH85X U/S
SX1/18
SX0001/18 AIP SUPPLEMENT
GLRB/ROB - MONROVIA/ROBERTS INTL
VALIDITY: 1808310000
UFN
PAPI RWY 04 INSTALLED, OPERATING BUT GROUND
CHECK ONLY AWAITING FLIGHT CHECK
SX4/23
SX0004/23 AIP SUPPLEMENT
GLRB/MONROVIA/ROBERTS INTL
VALIDITY: 31MAY23-PERM
ALS RWY 04 CHANGED AS FOLLOWS:
CAT1 900M DIRECTIONAL LIH
SX15/22

SX0015/22 AIP SUPPLEMENT
GLRB/MONROVIA/ROBERTS INTL
VALIDITY: 03AUG22-UFN
FIRE AND RESCUE DOWNGRADED TO CAT 6 DUE TO
LIMITED FIRE VEHICLES AND EQUIPMENT
1A82/24
TWY BRAVO CLSD DUE TO WIP
SX11/22
SX0011/22 AIP SUPPLEMENT
GLRB/MONROVIA/ROBERTS INTL
VALIDITY: 01AUG22 - PERM
FILLETS TO CATER TO B773 ARE NOW AVBL AT THE TURN
PAD OF TWY ALPHA AND BRAVO
SX68/20
SX0068/20 AIP SUPPLEMENT
GLRB/MONROVIA/ROBERTS INTL
VALIDITY: 27NOV20-UFN
ILS LLZ CH40X FREQ 110.3 MHZ CH40X COOR SHOULD READ
061452.1N 0102114.0W INSTEAD OF THE COOR PUBLISHED IN THE
AIP
SX58/10
SX0058/10 SUPPLEMENT RESTRICTIONS
GLRB/ ROB / MONROVIA ROBERTS INTL
VALIDITY: 1005030000
UFN
TWY A1 REMAINS CLSD TO ALL TFC
DUE MAINT. SX50/09
SX0050/09 SUPPLEMENT RESTRICTIONS
GLRB/ROB/MONROVIA
ROBERTS INTL
VALIDITY: 0908170000 - UFN
TWY C CLSD AWAITING
MAINTENANCE PILOTS TO AVOID THE AREA

Figure 17. RAM 567 Preflight Information Bulletin (PIB)for August 17,

There was a June 14, 2022, NOTAM suspending all instrument flight procedures approaches at Roberts International Airport (GLRB). At the end of that NOTAM in 3 months, it became a supplement.

ROBERTS FLIGHT INFORMATION REGION
POST OFFICE BOX 79, ROBERTSFIELD
1520 HARBEL, MARGIBI COUNTY
REPUBLIC OF LIBERIA

Tel: +231886702427/886887160

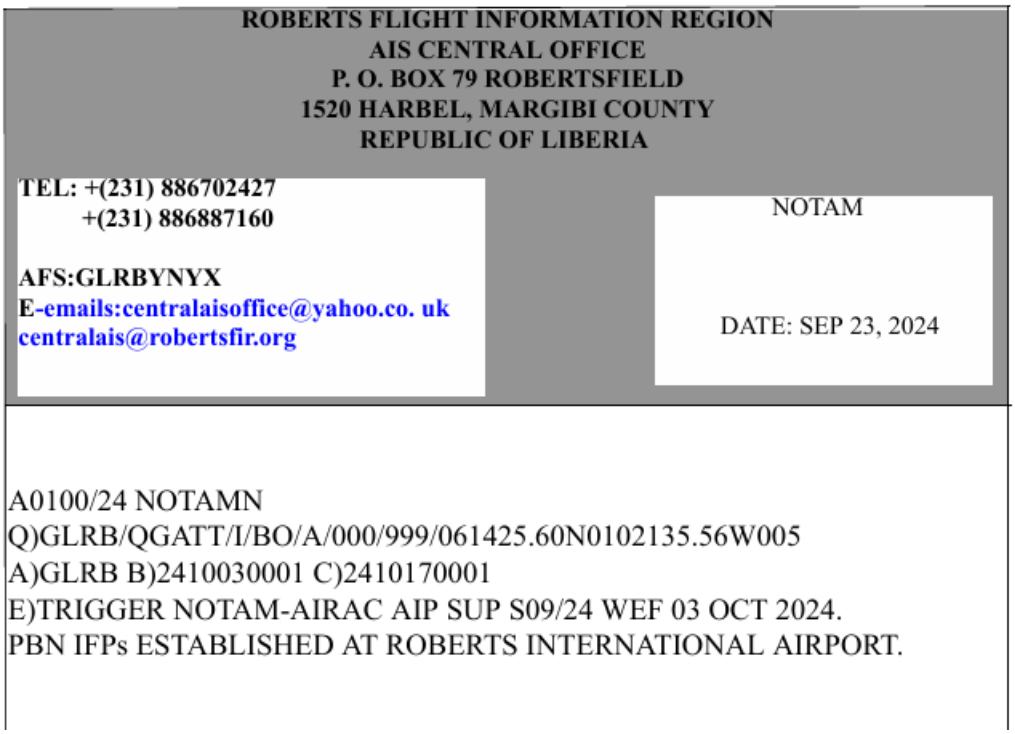
AFS: GLRBYNYX
E.mails: centralaisoffice@yahoo.co.uk
centralais@robertsfir.org

NOTAM

DATE: JUNE 14, 2022

A0083/22 NOTAMN
Q)GLRB/QXXAS/I/NBO/AE/000/999/061425.60N0102135.56W
A)GLRB B)2206142359 C)2209122359 EST
E)ALL INSTRUMENT FLIGHT PROCEDURES APPROACHES ARE
SUSPENDED.

Figure 18. RFIR Central AIS NOTAM of June 14, 2022, suspending all Instrument Flight Procedures (IFP) approaches at GLRG



ROBERTS FLIGHT INFORMATION REGION
AIS CENTRAL OFFICE
P. O. BOX 79 ROBERTSFIELD
1520 HARBEL, MARGIBI COUNTY
REPUBLIC OF LIBERIA

TEL: +(231) 886702427
+(231) 886887160

AFS:GLRBYNYX
E-emails:centralaisoffice@yahoo.co. uk
centralais@robertsfir.org

NOTAM

DATE: SEP 23, 2024

A0100/24 NOTAMN
Q)GLRB/QGATT/I/BO/A/000/999/061425.60N0102135.56W005
A)GLRB B)2410030001 C)2410170001
E)TRIGGER NOTAM-AIRAC AIP SUP S09/24 WEF 03 OCT 2024.
PBN IFPs ESTABLISHED AT ROBERTS INTERNATIONAL AIRPORT.

Figure 19. RFIR Central AIS TRIGGER NOTAM issued on September 23, 2024, on establishing new Instrument Flight Procedures (IFP)for GLRB with effective date of October 3, 2024

2. ANALYSIS

2.1. General

This analysis will discuss Organizational factors related to the flight's operations, human factors (CVR transcript), and aircraft handling during descent, with reference to CVR transcript, FDR data, MET reports, dispatch release documents, GLRB NOTAM, crew statements, and runway inspections.

The pilots were licensed for the flight in accordance with the Moroccan Ministry of Transport and Logistics, Directorate General of Civil Aviation. There was no evidence to support any medical condition that existed that might have adversely affected their performance during the flight.

The aircraft had a valid Certificate of Airworthiness at the time of the occurrence. No evidence indicated any failure of the aircraft's powerplants, structures, or systems that would have affected its performance during the occurrence.

2.2. Aircraft Handling during the landing and rollout phases

Just before the 2500ft marker, the crew reported not receiving the ILS signal and the autopilot was disengaged 8 seconds prior to the aircraft reaching the 1000ft mark. According to the GPWS, prior to the 1000ft mark the crew confirmed "runway in sight" and ATC cleared the flight to land on RWY 04. The crew experienced difficulty maintaining the visual glide path as indicated by the two (2) high sink rate alerts at the 500ft mark while executing the visual approach. At the100 ft mark, P1 called for wipers to "maximum" and P2 confirmed that it was on "maximum", and the wipers remained on for the remainder of the flight. After touchdown and during initial rollout, the crew reported a heavy downpour of rain that momentarily caused them to lose situational awareness causing two wheels on the left main landing gear to veer off the runway to the left side at L14 parallel to the runway and in the process damage two runway edge lights before returning to the runway centerline at around L17 and continued taxing to the gate. Additionally, the FDR report indicates a southeasterly wind at 26 knots during short final, touchdown, and rollout.

2.3. Organizational factors observed

The NOTAM of June 14, 2022, issued by the Roberts Flight Information Region's Central AIS office suspending all instrument flight procedures at Roberts International Airport (GLRB) was not included in the preflight information Bulletin (PIB) for the crew. Also, the two Royal Air Maroc staff email addresses that were registered on the NOTAM mailing list of the Roberts Flight Information Region's Central AIS office were no longer current or updated.

The Roberts Flight Information Region's Area Controller cleared the aircraft on the instrument flight procedures which had been suspended on June 14, 2022. Furthermore, the RFIR's ariel controller was operating with an invalid license due to his medical certificate being expired.

When the crew was turned over to the Liberia Civil Aviation Authority's (LCAA) Approach Controller, he also cleared them on the instrument flight procedures which had been suspended on June 14, 2022. Additionally, the approach controller's license was invalid due to his medical certificate being expired. During the communications between the Roberts Approach Controller and the flight crew, there were multiple instances of confusion as to what was being communicated between them.

It was disclosed to the investigators by the Liberia Airport Authority (LAA) that there is no means by which the ATC Controller can remotely monitor the serviceability of the ILS from within the control tower and that the voice recorder for the ATC was not serviceable. According to the report from the

MET department of the LAA, the AWOS's status was listed as "Unsatisfactory" and that it had not been calibrated. The SOP for the LAA's CNS department states that the ILS is inspected twice within a 24-hour period, at 0900h and 1600h. During the inspection of the damage to the runway caused by the landing aircraft, the investigators observed that the runway markings were severely faded.

3. CONCLUSIONS

3.1. Findings

1. The Roberts International Airport has no aerodrome certificate issued by the Liberia Civil Aviation Authority (LCAA) per Annex 14 and LCAR Part 14 to ensure compliance with international standards.
2. All Instrument Flight Procedures Approaches to Roberts International Airport were suspended as of June 14, 2022, and were no longer in force at the time of the incident on August 17, 2024.
3. The license of one of the Roberts FIR Area CONTROLLERS on duty was invalid due to medical certificate expiration date.
4. The license of the LCAA Roberts Approach CONTROLLER on duty was invalid due to medical certificate expiration.
5. The aircraft radio station license for Royal Air Maroc aircraft registration CN-RGW was invalid due to expiration.
6. The incident was not reported by the crew to the ATC after landing.
7. The crew abbreviated the approach to runway 04 bypassing RNAV waypoints RRCHY and DUCOR as cleared by the LCAA Roberts Approach CONTROLLER.
8. The crew reported to the LCAA Roberts Approach CONTROLLER at 05:12:29UTC that they were receiving no signal from the ILS.
9. The wind provided by the LCAA Roberts Approach CONTROLLER received from the AWOS did not correspond with the wind recorded from the FDR, resulting in a crosswind landing.
10. The aircraft touched down on the left side of the centerline of runway 04 per the FDR's data.
11. The crew stated that prior to their departure from Casablanca, they were unaware that all instrument flight procedures approaches to ROB had been suspended since June 14, 2022, and was not included in the preflight information Bulletin.
12. The crew was unaware that ROB approach did not ever have radar coverage before.
13. The Roberts FIR Area CONTROLLER was aware that all flight procedures approaches to ROB had been suspended since June 14, 2022.
14. The LCAA Roberts Approach CONTROLLER was aware that all flight procedures approaches to ROB had been suspended since June 14, 2022, however, he assumed at some point before the incident, the procedures had been reinstated.
15. The markings on the entire runway are severely faded and difficult to see by the crew especially during landings at night with reduced visibility.
16. The Roberts Air Traffic Control Tower had no serviceable voice recorder at the time of the incident, therefore, there were no transcripts made available to investigators for analysis.
17. The Roberts Air Traffic Control Tower has no means of directly switching on/off or adjusting the intensity of the runway lights.
18. The Roberts Air Traffic Control Tower has no means of remotely monitoring the status of the ILS from the control tower by controllers in order to advise the crews swiftly before or during the approach to runway 04.
19. The Liberia Airport Authority's (LAA) CNS Technicians have no means of remotely monitoring the status of the ILS and carry out two inspections per day (0900h and 1600h). At all other times, they rely on reports received from the aircraft through the ATC.
20. PAPIs on RWY 04/22 are awaiting flight check.
21. Fire and Rescue downgraded to CAT 6 due to limited fire vehicles and equipment.
22. There is no radar installation at the Roberts International Airport.
23. There is no direct radio communication between the marshaller and the Roberts Control Tower on the ground frequency 121.9 MHz.

3.2. Causal Factors

The decision of the crew to continue the approach to land despite prevailing adverse conditions.

3.3. Contributory Factors

1. The Royal Air Maroc (RAM) Dispatch at King Mohammed V International Airport in Casablanca (GMMN) did not include in the Preflight Information Bulletin (PIB) the NOTAM withdrawing all instrument flight procedures at Roberts International Airport (GLRB) which had been issued on June 14, 2022.
2. The Royal Air Maroc (RAM) crew were unaware that there was not and has never been a radar installation at the Roberts International Airport (GLRB) for approach control.
3. The Air Traffic Control (ATC) at Roberts International Airport (GLRB) did not have up to date/current status on the serviceability of the Instrument Landing System (ILS).
4. The Liberia Airport Authority's (LAA) meteorological reports provided the crew did not reflect the actual conditions that the aircraft experienced during the approach, touchdown, and rollout phases of the flight according to the FDR data.
5. During the approach and upon touchdown, there was a southeasterly crosswind impacting the aircraft.
6. After touchdown and during the landing roll, the aircraft encountered a sudden heavy downpour of rain that momentarily caused the crew to lose situational awareness, leading to the two wheels on the left-hand landing gear veering off of the runway for approximately 500 feet before returning to the runway centerline.
7. The lack of clear understanding by the controller of the requests from the crew regarding radar contact during the approach and final phase of the flight led to a confused situation.

4. SAFETY RECOMMENDATION

Immediate Safety Recommendations 2024-001: Obtaining Aerodrome Certificate

The AAIB recommends that the Liberia Airport Authority (LAA) should make immediate efforts to obtain an Aerodrome Certificate (License) from the LCAA ensuring that it meets and complies with all of the Standards and Recommended Practices (SARP) of ICAO Annex 14 and LCAA Regulations Part 14.

Immediate Safety Recommendations 2024-002: Update of Roster

The AAIB recommends that the LCAA and the Roberts FIR should immediately remove from their roster any air traffic controller whose license and medical certificate are not currently valid.

Immediate Safety Recommendations 2024-003: Calibration of Automatic Weather Observation System (AWOS)

The AAIB recommends that the Liberia Airport Authority (LAA) should ensure that the Automatic Weather Observation System (AWOS) installed at the Roberts International Airport is calibrated or replaced immediately in order to provide current and accurate weather information to the pilot through the Air Traffic Control (ATC) Tower at all times.

Immediate Safety Recommendations 2024-004: Radar Acquisition

The AAIB recommends that the Liberia Airport Authority (LAA) should make immediate efforts and obtain an Airport Surveillance Radar (ASR) and a Precision Approach Radar (PAR) within one year to increase the current approach capability and serve as a backup for arriving and departing aircraft.

Immediate Safety Recommendations 2024-005: Replace Air Traffic Control (ATC) Tower Voice Recorder

The AAIB recommends that the Liberia Airport Authority (LAA) should immediately make serviceable or replace the voice recorder equipment installed in the Air Traffic Control (ATC) tower.

Immediate Safety Recommendations 2024-006: Enhanced access control of the Runway light by Air Traffic Controller

The AAIB recommends that the Liberia Airport Authority (LAA) should immediately provide means by which the air traffic controller can switch on/off and adjust the intensity of all runway lights.

Immediate Safety Recommendations 2024-007: Installation and remote access of NAVAIDs by Air Traffic Controller (ATC)

The AAIB recommends that the Liberia Airport Authority should immediately install equipment within the control tower to enable the air traffic controllers to remotely monitor the status of the ILS and all NAVAIDs at all times. The Communications, Navigation, and Surveillance (CNS) technicians should also have the same capability to remotely monitor the status of all NAVAIDS at all times.

Safety Recommendations 2024-008: Dispatcher Verification

The AAIB recommends that the operator, Royal Air Maroc, should ensure that they receive all NOTAMS published by the Roberts FIR Central AIS Office once they are promulgated in order that they may be included in the pilot Bulletin before departure from Casablanca. Royal Air Maroc should ensure that staff email addresses that are registered on the NOTAM mailing list of the Roberts Flight Information Region's Central AIS office are current and updated.

Safety Recommendations 2024-009: Repainting of Runway Markings

The AAIB recommends that the Liberia Airport Authority (LAA) should repaint all runway markings with ample reflective glass beads to ensure visibility during minimum weather conditions especially at night. Additionally, they should install center line lighting on the full length of the runway.