

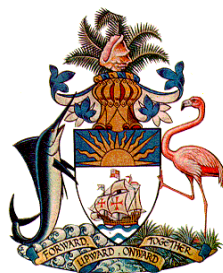
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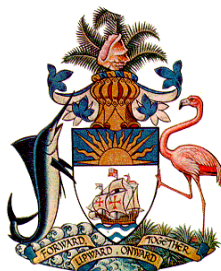
BAHAMAS FLIGHT STANDARDS INSPECTORATE

NASSAU, N. P., BAHAMAS

AIRCRAFT ACCIDENT REPORT

**Propulsion System Malfunction
Inappropriate Crew Response
PIPER AZTEC, PA 23-250, C6-LEE
NASSAU, BAHAMAS
31 JULY, 2007**





Flight Standards Inspectorate Bahamas Department of Civil Aviation

TABLE OF CONTENTS

Note to Director	4
Investigation Participants	5
Crash Scene Diagram	6
Sample Photos	7
 SYNOPSIS	 10
• Abbreviations and Terminology	11
• Definitions	12
• Overview	13
 BODY	
FACTUAL INFORMATION	14
1.1 HISTORY OF THE FLIGHT	14
1.2 INJURIES TO PERSONS	15
1.3 DAMAGE TO AIRCRAFT	15
1.4 OTHER DAMAGE	15
1.5 PERSONNEL INFORMATION	
1.5.1 Captain	15
1.6 AIRCRAFT INFORMATION	
1.6.1 Airworthiness and Maintenance	15
1.6.2 Performance	16
1.6.3 Fuel	16
1.7 METEOROLOGICAL INFORMATION	16



1.8	AIDS TO NAVIGATION	16
1.9	COMMUNICATIONS	16
1.10	AERODROME INFORMATION	16
1.11	FLIGHT RECORDERS.....	16
1.12	WRECKAGE AND IMPACT INFORMATION	17
1.13	MEDICAL AND PATHOLOGICAL INFORMATION.....	19
1.14	FIRE.....	19
1.15	SURVIVAL ASPECTS	19
1.16	TESTS AND RESEARCH.....	19
1.17	ADDITIONAL INFORMATION.....	20

ANALYSIS

2.1	GENERAL.....	21
2.2	AIRCRAFT.....	21
	• Aircraft Performance.....	21
	• Mass and Balance.....	21
	• Aircraft Navigational Instrumentation.....	22
	• Human Factors.....	22
	• Psychological and physiological.....	22

CONCLUSIONS

3.1	Findings.....	23
3.2	Probable Cause.....	24
3.3	Contributing Factors.....	24

SAFETY RECOMMENDATIONS.....25

APPENDICES.....	26
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March 31, 2008

Capt. Patrick Rolle
Director
Civil Aviation Department
Seaban House
Crawford Street, Oakes Field
P.O. Box N-975
Nassau, N.P.,
Bahamas

Sir

The attached report summarizes the investigation into the circumstances of the accident involving Piper Aztec aircraft (PA 23-250), Bahamas Registration C6-LEE, registered to Leair Charter Limited. This accident occurred approximately 1 mile NW of Lynden Pindling International Airport, Nassau, Bahamas on 31 July, 2007.

This report is submitted pursuant to Part XII, Regulation 80, and Schedule 19 of the Bahamas Civil Aviation (Safety) Regulation (CASR 2001) and in accordance with Annex 13 to the Convention on International Civil Aviation Organization (ICAO).

In accordance with Annex 13 to the Convention on International Civil Aviation (ICAO), and Schedule 19 of the Bahamas Civil Aviation (Safety) Regulations (CASR April 17, 2001), the fundamental purpose of such investigations is to determine the circumstances and causes of these events, with a view to the preservation of life and the avoidance of similar occurrences in the future. It is not the purpose of such investigations to apportion blame or liability.

This information is published to inform the aviation industry and the public of the circumstances surrounding this accident. The contents of this Report may be subjected to alterations or corrections if additional information becomes available.

Delvin R. Major
Investigator in Charge
Flight Standards Inspectorate
Bahamas Department of Civil Aviation



Participants in the Investigation

Delvin Major	Flight Standards Inspectorate	IIC
Philip Romer	Flight Standards Inspectorate	Airworthiness
Walter V. Evans	Flight Standards Inspectorate	Airworthiness

Paul Lehman Jr.	Piper Aircraft	Aircraft Manufacturer
Edward Rogalski	Lycoming	Engine Manufacturer



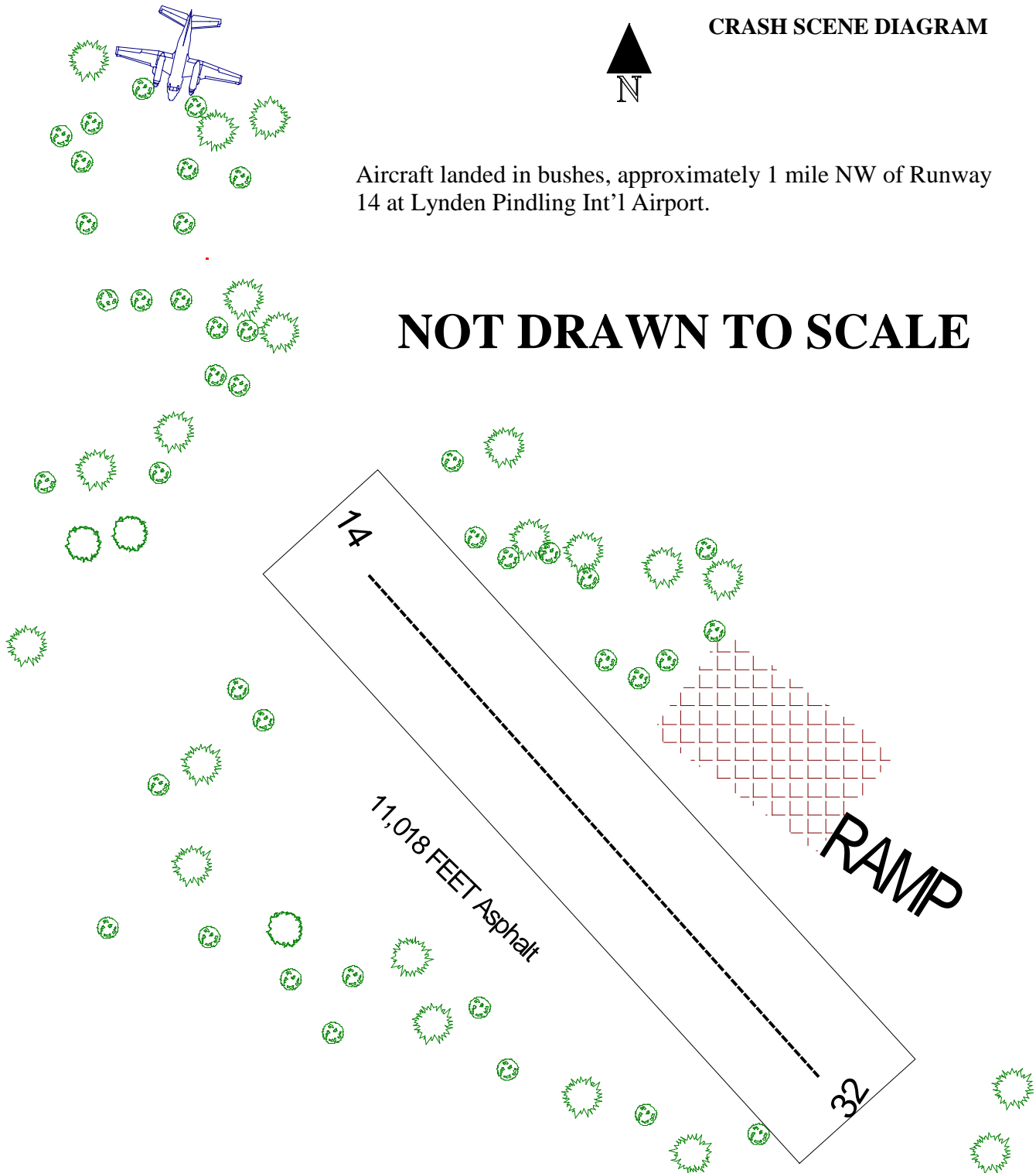
CASE NUMBER: A0825088

CRASH SCENE DIAGRAM



Aircraft landed in bushes, approximately 1 mile NW of Runway 14 at Lynden Pindling Int'l Airport.

NOT DRAWN TO SCALE



FLIGHT STANDARDS INSPECTORATE

INVESTIGATOR: DELVIN R. MAJOR	LOCATION: OFF FIELD APPROX 1 MILE NW OF LIPINTL AIRPORT	COUNTRY: BAHAMAS
WEATHER: VMC	RUNWAY COND.: ASPHALT	DATE OF OCCURENCE: JULY 31, 2007
DRAWN BY: DELVIN R. MAJOR	OCCURENCE: ACCIDENT	DATE DRAWN: AUG 1, 2007
		TIME OF INCIDENT: 1845Z 24 SEP 07
		SCALE: NOT DRAWN TO SCALE



Sample Photos



Left fuel strainer bowl found rusted, corroded and stained with sediments.



Fuel Selector set to Left and Right Outboard Tanks

Note: Both left and right outboard tanks were found empty however, both fuel tank selectors were found in the respective outboard position.



Fuel Manifold and Fuel Supply lines that were found contaminated with water and sediments. (Photo shows left engine only, however, both engines, and its associated fuel supply lines and flow dividers were found contaminated with water)



Right fuel strainer bowl found in the same sediment stained and corroded condition.





Water and fuel sample taken from right engine gaskolator. Taken on August 23, 2007. C6-LEE



Fuel taken from fuel line between servo and spider valve. August 23, 2007



Sediments and water filled tube taken from mechanical fuel pump to servo. August 23, 2007



Fuel fill tube with sediments from left fuel pump.



Rt. Engine fuel screen showing sediments / particles.



Fuel samples showing water dirt and other sediment retrieved from inspection of fuel lines, Gascolator and strainer of C6-LEE Left and right engine, fuel lines, Gascolator and spider valve.



FLIGHT STANDARDS INSPECTORATE
BAHAMAS CIVIL AVIATION DEPARTMENT

AIRCRAFT ACCIDENT
REPORT No. A0825088

Piper Aztec
C6-LEE
31 July, 2007

SYNOPSIS

Operator:	Private Individual
Manufacturer:	Piper Aircraft
Place of Accident:	Approximately 1 mile NW of Runway 14, Lynden Pindling International Airport, Nassau, Bahamas. Co-ordinates N 25° 03.215' W 77° 28.673'
Investigating Authority:	Flight Standards Inspectorate
Investigator in Charge:	Delvin R. Major
Notification:	Civil Aviation Department Piper Aircraft Inc. Lycoming
Party to Investigation:	Piper Aircraft Inc. Lycoming
Releasing Authority:	Director - Bahamas Civil Aviation Department
Date of Report:	March 31, 2008



ABBREVIATIONS and TERMINOLOGY

ADDS	Aviation Digital Data Service - Report furnished by Meteorological Department
AIS	Automatic Information Services
ATS	Air Traffic Services
BDCA	Bahamas Department of Civil Aviation
CASR	Bahamas Civil Aviation (Safety) Regulations (April 17, 2001)
C of A	Certificate of Airworthiness
C of R	Certificate of Registration
CG	Center of Gravity
CVR	Cockpit Voice Recorder
DCA	Director of Civil Aviation
DFDR	Digital Flight Data Recorder
DOO	Director of Operations
DRTL	Disaster Response Team Leader
DS	Director of Safety
CAD	Civil Aviation Department
EDT	Eastern Daylight Time (-5 hours (-4DT) to convert from UTC)
ERM	Emergency Response Manual
FAA	Federal Aviation Administration
FSI	Flight Standards Inspectorate
FSS	Flight Service Station
ICAO	International Civil Aviation Organization
ILS	Instrument Landing System
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Condition
LH MLG	Left Hand Main Landing Gear
MALSF	Medium-intensity Approach Lighting System (with sequenced flashers)
MD	Manager of Dispatch
MCM	Maintenance Control Manual
MET	Meteorological Office / Department
METAR	Weather Report furnished by Meteorological Department
MIRL	Medium Intensity Runway Lights
MYEH	ICAO Airport Designation – Governors Harbour
NDB	Non-directional Beacon
NM or nm	Nautical Miles
NTSB	National Transportation Safety Board
PAPI	Precision Approach Path Indicator
RCA	Root Cause Analysis
SEP	Survival and Emergency Procedures Training
T/L	Technical Log
TSBC	Transportation Safety Board of Canada
USA	United States of America
VFR	Visual Flight Rules
VOR	(Very High Frequency) Omni-directional Range Station
VMC	Visual Meteorological Conditions
UTC	Universal Coordinated Time
Z	Zulu time



DEFINITIONS

When the following terms are used in this report, they have the following meanings as per CASR 2001 and ICAO Annex 13;

“Aircraft Accident” – means an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage or the aircraft is missing or completely inaccessible.

"Fatal injury" - means any injury which results in death within 30 days of the accident.

“Flight recorder” - Any type of recorder installed in the aircraft for the purpose of complementing accident/incident investigation.

"Incident" - means an occurrence other than an accident, associated with the operation of an aircraft, which affects or could affect the safety of operations.

“Investigation”- A process conducted for the purpose of accident prevention which includes the gathering and analysis of information, the drawing of conclusions, including the determination of causes and, when appropriate, the making of safety recommendations.

“Serious injury” - means any injury which:

- Requires hospitalization for more than 48 hours, commencing within 7 days from the date the injury was received;
- Results in a fracture of any bone (except simple fractures of fingers, toes, or nose);
- Causes severe hemorrhages, nerve, muscle, or tendon damage;
- Involves any internal organ; or
- Involves second or third degree burns, or any burns affecting more than 5 percent of the body surface.
- Involves verified exposure to infectious substances or injurious radiation.

“Serious incident” - An incident involving circumstances indicating that an accident nearly occurred.

“State of Design” - The State having jurisdiction over the organization responsible for the type design

“State of Manufacture” - The State having jurisdiction over the organization responsible for the final assembly of the aircraft.

"Substantial damage" - means damage or failure which adversely affects the structural strength, performance, or flight characteristics of the aircraft, and which would normally require major repair or replacement of the affected component. Engine failure or damage limited to an engine if only one engine fails or is damaged, bent failings or cowling, dented skin, small punctured holes in the skin or fabric, ground damage to rotor or propeller blades, and damage to landing gear, wheels, tires, flaps, engine accessories, brakes, or wingtips are not considered "substantial damage" for the purpose of this Report.



OVERVIEW

On July 31, 2007, Nassau Air Traffic Control Tower advised the Flight Standards Inspectorate that a Piper Aztec (PA-23) “had gone down on final approximately 1 mile short of Runway 14”.

At approximately 2:45pm EST, C6-LEE, a Piper Aztec (PA-23) aircraft, crashed while attempting to return to the Lynden Pindling International Airport, due to unknown reasons. The pilot was in contact with the Nassau control tower and had not declared an emergency. The aircraft came to rest upright in a densely wooded area, approximately two miles northwest of Runway 14. Visual meteorological conditions prevailed at the time of the accident and a visual flight rules (VFR) flight plan was filed. There was no pre or post impact fire and the aircraft sustained substantial damage. The pilot and two passengers received serious injuries.

The flight departed Lynden Pindling International Airport and was destined for Governors Harbour and North Eleuthera. The aircraft departed around 2:15pm local time. Prior to the accident, the aircraft was on a left base and was cleared to land on runway 14 at Nassau Int’l Airport. This was the last communication between the tower and the aircraft. Prior to the flight, the pilot uploaded 14 gallons of 100LL aviation fuel to both inboard fuel tanks. (6.5 gallons was added to the left inboard fuel tank and 7.5 gallons were added to the right inboard fuel tank). No fuel was added to the outboard fuel tanks.

According to the pilot of the accident aircraft, he flew to an altitude of approximately 3,200 feet and was over Paradise Island when the left engine lost partial power. “The engine could only obtain 1,700 RPM.” The pilot further stated that he put both fuel pumps on, checked the mixture and the fuel selector valves. The pilot decided to return to the airport and did not declare an emergency. While on a three mile left base, the right engine started to lose power. The gear was already in the extended position. The pilot stated that he tried to make the runway but realized he could not. “He did not want to impact upcoming barb wire and lamp posts so he made a low level right turn and impacted trees.”

The State of Manufacture and State of Design (United States of America) were notified of the accident. They were invited to participate in the investigation in accordance with Annex 13 and CASR 2001 Schedule 19.

The on-scene investigation was conducted on July 31st 2007 by the Flight Standards Inspectorate and then again on August 3 and 4, 2007 by representatives of the manufacturer. Present at that investigation (August 3 and 4) were Mr. Ed Rogalski representing Lycoming Engines, Mr. Philip Romer of the Flight Standards Inspectorate, and Mr. Emile Lehman of Piper Aircraft. A minimal investigation was conducted at that time, due to the irregularity of the terrain, and poisonous berry trees draped on a portion of the aircraft. The engines could not be rotated due to the position of the aircraft and the terrain, trees and roots; however there were no signs of catastrophic engine failures. Both engine had ample oil in them. Both propellers remained attached to the engines. All cabin seats were intact and no damage was observed. Shoulder harnesses were installed for the pilot and copilots seats only. Both fuel tank selectors were found selected to the outboard fuel tank positions. Approximately one inch of fuel was found in the left outboard tank. The right outboard fuel tank was void of fuel. After the initial on scene inspection, fuel from both inboard tanks was removed and the four fuel tanks were filled with water as a safety and environmental precaution. Continuity was not established for the flight control surfaces. Several radios were removed by mechanics and are in the possession of this department for safe keeping pending the outcome of this investigation. However, on subsequent follow up inspection, it was discovered that the complete radio and instrument stack was removed from the aircraft by persons unknown. They were not viewed by Piper or Lycoming representatives.



During the period August 23 to 25, 2007, Representatives of Piper Aircraft accompanied by Mr. Walter V. Evans, Airworthiness Inspector of the Flight Standards Inspectorate, inspected the airframe and engines. The aircraft was recovered by Fernander's Trucking. The aircraft was moved to a dirt road for inspection and the engines were moved to the aircraft hanger owned by Leair Charter on the south end of Lynden Pindling International Airport. Continuity was established from the rudder to the rudder pedals and from the elevators to the cabin area. Continuity was not established between the aileron and the control columns due to lack of equipment. The right engine was found completely contaminated with water throughout the entire fuel system. Continuity was established throughout the engines rotating components. Thumb compression was noted in all cylinders. The left engine fuel lines were all separated except the line between the engine driven fuel pump and the servo. A faded green liquid sample was obtained and retained by the Authorities. Continuity was established throughout the engines rotating components.

The pilot is a Bahamian citizen and well known in Nassau. He has a Commercial pilot's certificate, airplane single/multi engine land and instrument ratings.

FACTUAL INFORMATION:

1.1 HISTORY OF THE FLIGHT

On July 31, 2007 at approximately 2:45pm local (1945Z) a Bahamian registered aircraft C6-LEE, a Piper Aztec PA-23 aircraft, registered to Leair Charters Limited** collided with trees before impacting the ground while attempting to return to the airport shortly after takeoff from runway 14 of the Lynden Pindling International Airport, Nassau, Bahamas. The charter flight originated from Lynden Pindling International Airport enroute to Governors Harbour and North Eleuthera, Bahamas. According to the pilot, this was the second flight conducted by C6-LEE on this day. There were two passengers aboard, who, in addition to the pilot, sustained serious injuries that required hospitalization.

The accident was located approximately 1 mile NW of Runway 14 at Lynden Pindling International Airport, Nassau, Bahamas at co-ordinates - N25° 03.429' and W77° 28.969'. The accident occurred during daylight time. Investigations have revealed that the charter flight was originally booked and confirmed with Southern Air Charter Limited a registered Bahamian Air Operator Certificate Holder (AOC).

Our investigation further revealed that the aircraft (C6-LEE) had been sold approximately three weeks prior to the accident and the Authorities had not been notified. Mr. Larry Brown, owner of Leair Charter stated that this aircraft was out of service and hangared for some time as it had been involved in an accident in September 2006. Mr. Brown also stated that the aircraft had just been released to service from maintenance after the installation of two new propellers and engines to replace those damaged in the previous accident. The aircraft had flown 2 test flights prior to being sold.

Mr. Symonette (pilot) reported that the accident flight was the second flight flown that day. He flew the aircraft earlier that morning to North Eleuthera. He reported that he had not put any fuel into the outboard fuel tanks.

*** At the time of the accident it was believed that the aircraft belonged to Leair Charter. The aircraft was still listed on the Operations Specification of Leair Charter. It was later revealed that the aircraft had been sold to a private individual approximately one month earlier and neither party had notified the Flight Standards Inspectorate to remove the aircraft from the Operations Specification of Leair Charters.*



Statements from Mr. Brown, Mr. Rolle, Mr. Symonette as well as agents of Southern Air Charter and Leair Charter are all on file with this department. As this matter is under litigation in the Bahamas Court System, they will not be made available here in this report. They however, may be released if requested by the judicial system.

1.2 INJURIES TO PERSONS

No fatal injuries were reported. All occupants received serious injury that required hospitalization.

1.3 DAMAGE TO AIRCRAFT

The aircraft was substantially damaged.

1.4 OTHER DAMAGE

No other damage reported to persons or property on the ground. Damage was confined to the aircraft and several trees along its path.

1.5 PERSONNEL INFORMATION

1.5.1 Captain Conrad Symonette

At the time of the accident, the aircraft was under the command of Captain Conrad Symonette. Captain Symonette, age 34, holds a Bahamian Commercial Pilot License number #382. Captain Symonette also holds a First Class Medical, with no limitations. The medical was issued on March 29, 2007. At the time of the accident Captain Symonette was employed by Cat Island Air Limited as a Captain on the Embraer EMB-110.

Captain Symonette flight and duty times on the PA-23 are unknown. No Proficiency Check, Line Check or Competency Check was made available for Captain Symonette to demonstrate proficiency or currency on the PA23 aircraft.

1.6 AIRCRAFT INFORMATION – GENERAL

1.6.1 AIRWORTHINESS AND MAINTENANCE

Piper Aztec (Piper PA23-250), serial number 27-7654049 was manufactured in 1976 by Piper Aircraft Company. It was registered in The Bahamas and bore the registration number C6-LEE. At the time of the accident Leair Charter Services Ltd. was on record with the Flight Standards Inspectorate as the registered owner. The aircraft was registered on 2nd July 2004. C6-LEE held a current valid Certificate of Airworthiness that was issued on 27th June 2007.

Aircraft History

As of April 3rd 2007, (the last recorded times in the aircraft records) C6-LEE had flown a total of 11831.2 hrs since manufactured. The aircraft was maintained by Leair Charter Services Ltd using Piper Progressive Maintenance Program for the Aztec PA 23-250 (Six Places). This program has Events 1 thru 4 that are accomplished at 50 hours intervals.

Engines

Both engines fitted to C6-LEE are Textron Lycoming model number I0-540-C4B5. The recommended overhaul period for this model (I0-540-C4B5) is 2,000 hours.

Left engine serial number L-22575-48A time since overhaul is 1005 hours and the time since last shop visit was 0.0 hrs.



Right engine serial number L17651-48A time since overhaul is 86.1 hours and the time since last shop visit was 0.0 hrs.

Propellers

Both propellers on C6-LEE were manufactured by Hartzell. The propellers were model number HC-E2YR-2RBSF. The recommended overhaul period for this model (HC-E2YR-2RBSF) is 2,000 hours or 5 years.

The No. 1 Propeller, serial number BA10096B, in-service time since overhaul is 0.00 hours.

The No. 2 Propeller, serial number BP7827, in-service time since overhaul is 0.00 hours.

NOTE: All times stated above are based on the last recorded aircraft times in the aircraft records dated 3rd April 2007.

1.6.2 PERFORMANCE

Aircraft performance suffered after power reduction initially. Aircraft performance suffered greatly after failure of both engines.

1.6.3 FUEL

The aircraft uplifted approximately 6.5 gallons of 100 LL fuel to the left inboard fuel tank and 7.5 gallons of 100 LL fuel to the right inboard fuel tank. No fuel was reportedly uplifted to either left or right outboard fuel tanks.

The pilot in his written statement confirmed that he does not use the outboard tanks and therefore did not put any fuel in them. *(However, post accident inspection has shown that the fuel selector valves were positioned to the respective outboard tanks).*

No information is available to indicate whether the pilot conducted a thorough preflight inspection, which would have included the draining of the fuel sumps of the fuel tanks. *(This aircraft had not flown commercially or otherwise since September 2006).*

1.7 METEOROLOGICAL INFORMATION

At the time of the accident the weather was Visual Meteorological Conditions.

1.8 AIDS TO NAVIGATION

Aids for navigation were not a factor in this accident.

1.9 COMMUNICATIONS

The pilot was in communication with the control tower at Lynden Pindling International Airport (MYNN), at all times up until the time of the crash. At no time during the flight did the pilot declare an emergency or asked for special assistance.

1.10 AERODROME INFORMATION

Information not included as landing was not made at the aerodrome.

1.11 FLIGHT RECORDERS

No flight recorder was installed on this aircraft. None was required by regulations.



1.12 WRECKAGE AND IMPACT INFORMATION

The accident aircraft was examined at the crash site on July 31, 2007, by Aviation Accident Investigators from the Flight Standards Inspectorate.

The aircraft came to rest in an upright position in a densely wooded area approximately one mile northeast of runway 14 at Lynden Pindling International Airport and about 1,000 feet south of West Bay Street, opposite Compass Point Studios. There was no pre or post impact fire and no ground injuries. Poisonous berry trees draped a portion of the aircraft and need to be removed prior to further investigation. The aircraft cut a swath path through trees about 73 feet in length. Numerous tree branches had propeller cut and aluminum particles imbedded in them.

LEFT WING

The left wing remained attached to the fuselage at the forward, main and aft spar attachments. The entire leading edge was crushed aft and upwards approximately six inches. The nacelle upper cowling was separated, exposing the engine. The engine mount was bent slightly inboard approximately five degrees. The left wing tip was separated and found approximately 30 feet east of the main wreckage. The left aileron remained attached to all its hinges and had impact damage to the inboard trailing edge tip, which was bent upwards. The left flap was separated into two pieces, and remained attached to the inboard and middle hinges. The outboard hinge had impact damage and separated the flap from the hinge. The left main landing gear was separated outboard and aft from its original position. The brake line remained attached. The inboard tank was drained of its fuel and filled with water due to safety and environmental concerns. The left outboard tank had approximately one inch of fuel which was removed and replaced with water. Both fuel caps were attached to the fuel tanks by a chain. Continuity was not established from the aileron to the flight controls in the cockpit.

RIGHT WING

The right wing remained attached to the fuselage at the forward, main and aft spar attachments. The inboard leading edge was crushed aft and the nacelle/engine mount was bent inboard approximately 30 degrees. The spinner from the right propeller had impacted the right side of the fuselage. The wing tip remained attached to the wing with damage to the leading and trailing edge. The aileron remained attached to its hinges and wrinkled along its entire length. The flap was attached to its hinges and in the retracted position. No damage to the flap was observed. The main landing gear was separated aft and destroyed. The remaining fuel from both inboard fuel tanks were removed and replaced with water. The outboard tank had approximately one inch of fuel and was filled with water as a safety precaution, in an effort to prevent fires. Both fuel caps were attached to the fuel tanks by a chain. Continuity was not established from the aileron to the flight controls in the cockpit. Continuity was established between the rudder pedals and the rudder and the stabilator and the cockpit area.

On August 23, 2007, the accident site was revisited by representatives of Piper Aircraft and Inspector Walter V. Evans, Flight Standards Inspectorate Airworthiness Inspector. The right fuel strainer was drained and was completely filled with water. The outboard and inboard drains were open and they were both found filled with water. The fuel strained sample was about 99 percent water. The inboard drain sample was about 25 percent water and the outboard drain sample was approximately 55 percent water. The fuel strainer filters were corroded. *(The water found in the lower portion of the fuel drain system may be as a result of the water placed in the fuel tanks for safety).*



FUSELAGE

The left side of the fuselage had wrinkling of the skin forward of the tail cone section. The pilot's window was completely broken out of its frame. The forward cabin door was separated from its upper hinge and the door lock was in the locked position. The cabin roof had numerous wrinkles near the forward cabin door. The emergency exit, located on the right side of the fuselage was intact and not used to exit the aircraft after the landing. The pilot's windscreen was completely broken out and the co-pilot's windscreen was cracked. The right rear baggage door remained intact to its piano hinge and was not damaged. The door was in the open position. The nose cone was completely fragmented upward and aft by impact with terrain and trees. The aircraft battery was not able to be disconnected as access to the battery panel was obstructed due to the aircraft being pinned against trees. The forward baggage door was separated and substantially damaged. All radios were intact and later removed from the aircraft by mechanics of Leair and turned over to the Flight Standards Inspectorate. (However, later inspections revealed that instruments and other navigational equipment were removed from the aircraft. The whereabouts and person(s) responsible for their removal are unknown).

TAIL CONE

The tail cone was bent forward and to the left approximately 45 degrees. The bending started forward of the vertical fin, near the dorsal fin. The vertical fin and rudder assembly were crushed inboard on the right side. Continuity was established between the rudder and the rudder pedals in the cockpit. The horizontal stabilizer was attached to the rear bulkhead. Trees had damaged the left tip leading edge. The left elevators trailing edge was deformed at its inboard edge, next to the anti servo trim tab. The anti servo trim tab was attached to the horizontal stabilizer and no visible damage was documented. The right side of the stabilizer had outboard leading edge damage starting inboard of the tip and continued inboard approximately two feet. All balance weights were intact. Continuity was established from the elevator to the aft cabin area.

LEFT PROPELLER

The Left propeller remained attached to the engines crankshaft flange. One blade remained attached to the hub and showed no signs of damage.

The second blade remained attached to the hub and was bent aft, at mid span, approximately 90 degrees. There were numerous gouges and nicks, on the leading edge of the blade.

RIGHT PROPELLER

The propeller remained attached to the crankshaft flange and the spinner. One blade was bent forward approximately 90 degrees at mid span. The outboard four inches of the leading edge tip was separated and could not be located.

The second blade was bent forward in an "S" shape. The outboard five inches of the tip was curled aft about 90 degrees.

Also noted at the site were the following;

- Both fuel tank selectors, located between the pilot and copilot seat were found selected to the outboard fuel tank positions.
- Upon further visual inspection, both outboard fuel tanks were found empty.



- There was no indication that any of the four (4) fuel tanks had ruptured during the impact with trees or terrain.
- There was no evidence of fuel odor to indicate a fuel leak or ruptured fuel tank.
- There were no punctures noted to the underside of the wings that would allow fuel to leak.
- It was also reported that during the refueling of the aircraft prior to this flight, no fuel was added to the outboard tanks.

On August 3 and 4 and August 23 thru 26, subsequent investigations and a further teardown inspection was conducted by Flight Standards Inspectorate Airworthiness Inspectors as well as representatives of Piper Aircraft and Lycoming (aircraft and engine manufacturers). All major components of the aircraft were accounted for at the scene and at the teardown inspection. (See Test and Research Section 1.16)

1.13 MEDICAL AND PATHOLOGICAL INFORMATION

Not a factor in this investigation

1.14 FIRE

There was no pre or post impact fire.

1.15 SURVIVAL ASPECTS

Not a factor in the investigation.

1.16 TESTS AND RESEARCH

During the period August 23 thru 26, 2007, a more detailed examination of the wreckage was carried out after the aircraft was removed from the site and transported to the Maintenance Hanger of Leair Charter, Coral Harbour Road.

LEFT POWERPLANT NOTES

On August 23, the left engine was examined by Mr. Walter V. Evans of the Flight Standards Inspectorate and Mr. Emile Lehman representative of Piper Aircraft in Nassau, at Leair Charter hangar. The six top Champion sparkplugs (REM 40E) and ignition wires were removed from the cylinders. All six plugs appeared to have normal wear and color. The fuel line from the mechanical fuel pump and the servo was removed and a faded green color liquid was recovered. The liquid had a slight odor of fuel. The fuel line between the spider valve and the servo was broken at the spider valve and no fuel sample was obtained. All other fuel lines were separated. The six rocker covers were removed and engine was rotated by hand using the propeller. All rocker arms, pushrods, and valves were observed moving. Rotation of the vacuum pump and the right magneto gears were also observed moving. Continuity was established throughout all the engines rotating components. Thumb compression was noted in all six cylinders. The servo fuel filter was removed and an odor of fuel was evident. No fuel sample was obtained from the servo. The servo was separated from the engine at its mounting pad. The oil filter was removed and cut open for inspection and no metal was observed within the filter. The oil cooler remained attached to the engine and the oil lines were separated at the cooler.

RIGHT POWERPLANT NOTES

On August 24, 2007, the right engine was examined by Mr. Walter V. Evans of the Flight Standards Inspectorate and Mr. Emile Lehman representative of Piper Aircraft in Nassau, at Leair Charter hangar. The top six Champion REM 40 E sparkplugs were removed along with the ignition harness. The spark plugs were normal in wear and color. The fuel line between the engine



driven fuel pump and the servo was removed and a water sample was recovered. The fuel line between the servo and the spider valve was removed and again a water sample was recovered. The fuel servo fuel inlet screen was removed and water droplets were observed. The six rocker covers were removed and engine was rotated by hand using the propeller. All rocker arms, pushrods, and valves were observed moving. Rotation of the vacuum pump and the right magneto gears were also observed moving. Continuity was established throughout all the engines rotating components. Thumb compression was noted in all six cylinders. The oil filter was removed and cut open. No metal was observed within the filter. The oil cooler was separated from the engine at its mount and the oil lines were separated at the cooler.

1.17 ADDITIONAL INFORMATION

Not Applicable



ANALYSIS:

2.1 GENERAL

- **Pilot qualifications** –
 - Pilot qualified in accordance with Bahamas Civil Aviation (Safety) Regulations. Pilot had accomplished Proficiency Checks and Line Checks on the EMB 110 as required by regulations. Pilot held appropriate flight and medical certificates.
 - It was not known if pilot had flown this type of aircraft PA-23 in the past.
 - Pilot was employed at the time of the accident by Cat Island Air limited and was PIC of an EMB 110 aircraft. No records were produced to show the pilot's currency or proficiency on the PA-23 aircraft.
- **Weather** – Visual Meteorological Conditions existed at the time and was not a factor in this accident.
- **ATC** – Air Traffic Control was available at the Lynden Pindling International Airport and provided assistance to the aircraft.
- **Aids to Navigation** – navigational aid were operational and was not a factor in the accident.
- **Preflight** – Due to the amount of water found in the aircraft engine and fuel system, engine manifold and fuel lines it is evident that a proper preflight was not conducted by the pilot prior to this flight.

2.2 AIRCRAFT

The Piper Aztec PA23-250 aircraft is a twin piston-engine, propeller-driven, airplane. It is carbureted, normally aspirated, air-cooled with a retractable tricycle landing gear configuration. This Aircraft was maintained in accordance with Leair Charter Services Ltd Approved Piper Progressive Maintenance Program for the PA23-250 (Six Places). This program is based upon the Manufacturer, Piper Aircraft Company Progressive Maintenance Program for the PA23-250 (Six Places)

Inspections accomplished on the aircraft over the past twelve months are as follows:

- An Event #2 Inspection c/w on April 3rd 2007 at 11838.2 hrs.
- An Event #1 Inspection c/w on June 11th 2006 at 11800.0 hrs.
- An Event #4 Inspection c/w on April 11th 2006 at 11750.2 hrs.
- An Event #3 Inspection c/w on February 5th 2006 at 11715.1 hrs.

The airplane was properly certificated, and there was no evidence that airplane maintenance was a factor in the accident.

- **Aircraft performance** – Aircraft performance suffered greatly after failure of both engines.
- **Mass and balance** – The aircraft was last weighed on 17th July 2007. Mass and balance report was not completed by the pilot for this flight as required by Bahamas Civil Aviation Regulations.



- **Aircraft Navigational Instrumentation** – aircraft navigational instrumentation was operational and was not a factor in the accident.
- **Human factors** – There was no evidence that incapacitation or physiological factors affected the pilot performance prior to the accident.
- **Psychological and physiological factors affecting personnel involved.** - There was no evidence that the pilot suffered any sudden illness or incapacitation which might have affected his ability to control the aircraft.



CONCLUSIONS

3.1 Findings

1. C6-LEE was involved in an accident on September 12, 2006 in Mayaguana, Bahamas. (Gear up landing)
2. Aircraft was later recovered, ferried to Nassau where it underwent extensive maintenance repairs.
3. In April 2007 both engines and both propellers were replaced on C6-LEE. Exact dates unknown.
4. During the same period a Phase 2, 50 hour inspection was completed by Leair Charter.
5. No evidence exists to show that flights were conducted privately or commercially during this period. (September 2006 to July 31, 2007). However, 2 test flights after installation of the engines and propellers were conducted approximately 2 days prior to the crash of the aircraft.
6. 17 July 2007, C6-LEE was sold by Leair charter to Mr. John Rolle. (*The conditions surrounding the ownership, sale and disposition of the aircraft is presently in dispute*).
7. Investigation determines that fuel contamination as the probable cause of the failure of both engines.
8. Inappropriate crew response also a contributing factor in this accident.
9. The fuel line between the servo and the spider valve was removed and water was removed from the lines.
10. The fuel line between the engine driven fuel pump and the servo was removed and water was also found in the lines.
11. The fuel servo inlet screen was removed and water droplets were present.
12. Samples were removed from a secure enclosed section of the right front side of the aircraft and the following was found.
 - i. Right Gascolator (fuel strainer) sample was collected (2 samples approximately 99.9% water and .01% oil).
 - ii. Right inboard second line drain sample was collected. (1 sample approximately 25% water).
 - iii. Right outboard second line drain sample was collected. (1 sample approximately 55% water).
13. The amount of water and sediments gathered from the fuel manifold, lines and filter is evident that a proper preflight was not conducted and fuel was not properly drained from the fuel strainer to remove such water and sediments. As this aircraft had not been flown due to maintenance work being conducted on it for approximately 10 months, it is possible that water and sediments may have collected in the tanks or may have been introduced when fuel was added to the tanks prior to the flight. This water and sediment were eventually drawn into the fuel system, made its way to the engine which in turn may have caused both engines to fail.
14. The pilot uplifted fuel to both inboard fuel tanks prior to this accident flight.
15. No fuel was uplifted to either outboard fuel tank prior to this accident flight.
16. Post accident investigation revealed both inboard fuel tanks were almost full with fuel (Avgas 100LL).
17. Post accident investigation revealed no fuel in either of the outboard tanks.
18. Post accident investigation revealed that both fuel selectors were found at the respective outboard fuel tank position.
19. Pilot failed to recognize the severity of the emergency he was faced with.



20. Pilot failed to declare an emergency after failure of first engine.
21. After failure of first engine, pilot elected to follow traffic flow and return to runway 14 (active runway at the time).
22. Runway 27 was available to the pilot had he declared an emergency.
23. Poor judgment was exercised in selecting field after emergency.
24. Based on the position and altitude of the aircraft at the time of first engine failure, had the pilot elected to declare an emergency and return to runway 27(which was available), it is possible that this accident may have been avoided.
25. Pilot failed to declare an emergency, even after failure of second engine.
26. Sale of aircraft from an AOC holder to a private individual occurred. The Authorities were never notified therefore it was not removed from the Operations Specifications or Registration Certificate of Lear Charter.
27. On August 1 2007, one (1) day after the accident, notification was sent by Mr. Brown of Lear Charter dated July 19th, 2007 to remove the aircraft from the Operations Specifications of Lear Charter. A copy of a bill of sale, executed on July 17, 2007 between Mr. John Rolle of JOROL Limited and Mr. Larry Brown of Lear Charter Limited accompanied the document.
28. Investigations indicate that a possible illegal charter operation existed here.

3.2 Probable Cause

The probable cause of this accident has been determined as Propulsion System Malfunction due to fuel contamination.

3.3 Additional Contributing Factors

- Inappropriate pilot response has also been determined as a major contributing factor to this accident.
- Inadequate or possible absence of a preflight inspection also greatly contributed to this accident.
- Pilot's unfamiliarity with aircraft fuel system. (No evidence exists to show pilots' proficiency or competency on this aircraft).



4.0 SAFETY RECOMMENDATIONS:

Based on the investigation to date it is highly probable that the flight that occurred was a possible illegal charter conducted by an individual without an Air Operator Certificate.

The recommendations that follow address this issue;

1. Ensure that the Bahamas Civil Aviation Department makes available to the General Public as well as all AOC holders the list of Legal AOC operators.
2. Ensure that all AOC holders are aware of the risks associated with assigning commercial flights to illegal operators (without an AOC certificate).
3. Ensure that strict penalties (*which can include suspension or revocation of AOC*) are levied against AOC holders that contravene the Civil Aviation (Safety) Regulations and uses the service of illegal operators to conduct commercial flights.
4. Request that the appropriate authorities enhance surveillance of areas such as the Domestic Section, General Aviation Center as well as both Fixed Base Operators in an effort to eliminate the operations being conducted by illegal charter operators.
5. A re-examination of the pilot should be conducted to demonstrate his ability to continue to hold a Bahamian License.



APPENDIX

Photo show tail section nearly separated from fuselage after the impact.



Path made by aircraft during the crash. Photo show trees cut during the descent to the terrain.



Photo shows intrusion into rudder area of the cockpit.



Photo of right outboard tank showing no fuel in tank.



Photo showing extent of damage sustained by aircraft.

