

FSI# A0929630



BAHAMAS FLIGHT STANDARDS INSPECTORATE

NASSAU, N. P., BAHAMAS

AIRCRAFT ACCIDENT REPORT

**Propulsion System Malfunction
Inappropriate Crew Response
CESSNA 421B GOLDEN EAGLE
NASSAU, BAHAMAS
29 January, 2009**





Flight Standards Inspectorate Bahamas Department of Civil Aviation

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September 30, 2009

Capt. Patrick Rolle
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Sir

The attached report summarizes the investigation into the circumstances of the accident involving Cessna 421B Golden Eagle aircraft, Bahamas Registration C6-DXL, registered to Glen Pratt. This accident occurred on the field at Lynden Pindling International Airport, Nassau, Bahamas on 29 January, 2009.

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.

Philip C. Romer
Investigator in Charge
Flight Standards Inspectorate



FLIGHT STANDARDS INSPECTORATE
BAHAMAS CIVIL AVIATION DEPARTMENT

AIRCRAFT ACCIDENT
REPORT No. A0929630

Cessna 421B Golden Eagle
C6-DXL
29 January, 2009

SYNOPSIS

Operator: Private Individual

Manufacturer: Cessna 421B Golden Eagle

Place of Accident: On the field at the approach end of Runway 14, Lynden Pindling International Airport, Nassau, Bahamas.

Investigating Authority: Flight Standards Inspectorate

Investigator in Charge: Philip C. Romer

Notification: Civil Aviation Department
Teledyne Continental

Party to Investigation: Teledyne Continental

Releasing Authority: Director - Bahamas Civil Aviation Department

Date of Report: September 30, 2009



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 January 29, 2009, Nassau Air Traffic Control Tower advised the Flight Standards Inspectorate that a Cessna Golden Eagle (C421B) “had gone down on final on the field short of Runway 14”.

At approximately 9:45pm EST, C6-DXL, a Cessna Golden Eagle (C421B) aircraft, crashed while attempting to land at the Lynden Pindling International Airport. The pilot was in contact with the Nassau control tower and had not declared an emergency. The aircraft made contact with the ground inside the perimeter fence approximately 200 feet from the fence and slid along the ground approximately 300 feet coming to rest upright on the field at the approach end of Runway 14. There was no pre or post impact fire and the aircraft sustained substantial damage. The pilot and passengers received no serious injuries.

The flight departed San Andros International Airport and was destined for Lynden Pindling International Airport. Prior to the accident, the aircraft was on final and was cleared to land on runway 14 at Lynden Pindling Int’l Airport. This was the last communication between the tower and the aircraft. Prior to the flight, the pilot uploaded 100 gallons of 100LL aviation fuel.

According to the pilot of the accident aircraft, the right engine started running rough five miles out and on final he lost both engines.

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 the night of January 29, 2009 by the Flight Standards Inspectorate and then again on January 30, 2009. A minimal investigation was conducted at that time, due to darkness and the fact that the runway had to be cleared. The engines could not be rotated due to the position of the aircraft; 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. 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 fuel drain on the left wing inboard was frozen due to corrosion. Both propellers were bent backwards suggestion that they were producing some power. 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 January 29, 2009 at approximately 9:45 pm local (0245Z) a Bahamian registered aircraft C6-DXL, a Cessna Golden Eagle C421B aircraft, registered to Mr. Glen Pratt impacted the ground while attempting to land on runway 14 of the Lynden Pindling International Airport, Nassau, Bahamas. The emergency flight originated from San Andros International Airport, destination, Lynden Pindling International Airport. A weight & balance and performance calculations was not completed for this flight as required by regulations Schedule 10.430 and 10.435. An exact number of occupants on board the aircraft at the time of the accident have not been determined. Three passenger lists were produced post-accident. All lists reviewed listed a different number of passengers.

The accident occurred on the field, at the approach end of Runway 14 at Lynden Pindling International Airport, Nassau, Bahamas. The accident occurred during night time.

1.2 INJURIES TO PERSONS

No fatal injuries were reported. No serious injuries were reported.

1.3 DAMAGE TO AIRCRAFT

The aircraft was substantially damaged.

1.4 OTHER DAMAGE

Damage was confined to the aircraft and several runway lights.

1.5 PERSONNEL INFORMATION

1.5.1 Captain Glen Pratt

At the time of the accident, the aircraft was under the command of Captain Glen Pratt. Captain Pratt, age 48, holds a Bahamian Commercial Pilot License number #380. Captain Pratt also holds a First Class Medical, with no limitations. The medical was issued on February 15, 2008.

1.6 AIRCRAFT INFORMATION – GENERAL

1.6.1 AIRWORTHINESS AND MAINTENANCE

Cessna 421B Golden Eagle, serial number 421B0457 was manufactured in 1973 by Cessna Aircraft Company. It was registered in The Bahamas and bore the registration number C6-DXL. At the time of the accident Mr. Glen Pratt was on record with the Flight Standards Inspectorate as the registered owner.



Aircraft History

The aircraft records list an annual inspection done December 19, 2008. No other maintenance activity was recorded since this time. C6-DXL had flown a total of 6876.7 hrs since manufactured. The aircraft was maintained by Ramsco Aviation and the records show that 50 and 100 hour and annual inspections were recorded.

Engines

Both engines fitted to C6-DXL were Teledyne Continental model number GTSIO-520H. The recommended overhaul period for this model (GTSIO-520H) is 1600 hours. The following hours were noted from records reviewed and appear consistent since last inspection of Dec 19, 2008.

Left engine serial number 817501-R time since overhaul was 1188.7 hours.

Right engine serial number 235083R time since overhaul was 470.7 hours.

Propellers

Both propellers on C6-DXL were manufactured by McCauley. The propellers were model number 3AF34C92. The following hours were noted from records reviewed and appear consistent since last inspection of Dec 19, 2008.

The No. 1 Propeller, serial number 746008, in-service time since overhaul is 288.5 hours.

The No. 2 Propeller, serial number 900259, in-service time since overhaul is 228.5 hours.

1.6.2 PERFORMANCE

Aircraft performance suffered greatly due to the actions of the pilot. Interview with the pilot revealed that;

1. Right Engine failed enroute
2. Pilot elected to extend gear and flaps 5 miles on final to runway 14
3. No weight and balance calculations were made for the flight passengers, bags, fuel etc..
4. Amount of passengers and their weight could not be confirmed.

1.6.3 FUEL

The aircraft uplifted approximately 100 gallons of 100 LL fuel. The pilot submitted a fuel slip for this amount.

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. (*The fuel drain inboard on left hand wing was frozen and corroded*).

1.7 METEOROLOGICAL INFORMATION

At the time of the accident the weather was fair.



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

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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 the night of January 29, 2008, by Aviation Accident Investigators from the Flight Standards Inspectorate.

The aircraft came to rest in an upright position on the airfield at the approach end of runway 14. There was no pre or post impact fire and no ground injuries.

LEFT WING

The left wing remained attached to the fuselage at the forward, main and aft spar attachment. The left engine was intact and still on the wing. The left propeller exhibited curling and other gorge marks damage consistent with a propeller producing power when making contact with the ground. This evidence is contrary to the pilot's statement that both engine failed.

RIGHT WING

The right wing remained attached to the fuselage at the forward, main and aft spar attachments. The engine was intact and remained on the wing. The left propeller was found in a feathered position. Two (2) of the three (3) blades received damage consistent with the aircraft making contact with the ground with no power.

FUSELAGE In addition to the obvious damage to the propellers, the aircraft main and nose gear were sheared from the airframe and the aircraft came to rest on its belly. Damage was done to the underside of the fuselage and cables and antennas located on the underside of the fuselage.

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

The right engine was removed and shipped to Certified Engines for testing and tear down.

RIGHT POWERPLANT NOTES



The right engine was examined and the fuel pump tested. The tests suggest that the fuel pump was not operating at maximum pressure.

1.17 ADDITIONAL INFORMATION

Not Applicable

ANALYSIS:

2.1 GENERAL

- **Pilot qualifications** –
 - Pilot qualified in accordance with Bahamas Civil Aviation (Safety) Regulations. Pilot held appropriate flight and medical certificates.
- **Weather** – It was a clear night 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 frozen and corroded fuel drain it can be suggested that a proper preflight was not conducted by the pilot prior to this flight.

2.2 AIRCRAFT

The Cessna Golden Eagle (421B) aircraft is a twin piston-engine, propeller-driven, airplane. It is fuel injected, air-cooled with a retractable tricycle landing gear configuration. This Aircraft was maintained in accordance with the manufacturer Maintenance Program.

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

- An Annual Inspection c/w on December 19, 2008 at 6876.7 hrs. ACTT.
- **Aircraft performance** – Aircraft performance suffered greatly after loss of power in right engine.
- **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. Failure of the engine driven (high Pressure) fuel pump on the right engine.
2. Unable to determine whether pilot elected to turn on stand-by (low pressure) pump.
3. Pilot reported that he extended gear and flaps 5 miles on final.
4. Engine on right side was found in the feathered position post accident. Unable to determine when this action occurred automatically or whether or not the pilot feathered it.
5. Load and balance may have been a factor in this accident. Unable to determine weight and balance of aircraft. Conflicting reports as to the amount of passengers onboard.
6. Pilot failed to complete an aircraft loading and Mass and Balance calculations prior to this flight as required by Bahamas Civil Aviation Safety Regulations (BASR) Schedule 10.430.
7. Performance of the aircraft was a major factor in this accident. Pilot failed to determine performance of the aircraft prior to departure in contravention of BASR Schedule 10.435.
8. Additional drag created by extension of flaps and gear at such a low altitude and distance from the airfield may also have contributed to the reduced performance of the aircraft.
9. Pilot claimed both engines failed. Inspection post accident revealed that the aircraft was developing power up to the time it touched down. Signature marks on the propeller confirmed this.

3.2 PROBABLE CAUSE

The probable cause of this accident has been determined as inappropriate crew response to failed engine. Pilots unfamiliarity with the systems of the aircraft and the emergency procedures associated with such failures (in this instance the engine) contributed greatly to this accident.

4.0 SAFETY RECOMMENDATIONS:

The recommendations that follow address this issue;

1. Ensure that strict penalties (*which can include suspension or revocation of certificate*) are levied against certificate holders that contravene the Civil Aviation (Safety) Regulations.
2. A re-examination of the pilot should be conducted to demonstrate his ability to continue to hold a Bahamian License.

